SCHLOSS DAGSTUHL
Leibniz-Zentrum für Informatik

Jahresbericht
Annual Report
2020

SCHLOSS DAGSTUHL
Leibniz-Zentrum für Informatik

Jahresbericht
Annual Report
2020

Herausgeber	Schloss Dagstuhl – Leibniz-Zentrum für Informatik GmbH Oktavie-Allee, 66687 Wadern, Germany Telefon: +49 681 302 - 4396 Fax: +49 681 302 - 4397 E-Mail: service@dagstuhl.de
Registernummer	Amtsgericht Saarbrücken HRB 63800
Vorsitzender des Aufsichtsrates	Prof. Dr.-Ing. Dr. h. c. Stefan Jähnichen
Geschäftsführung	Prof. Raimund Seidel, Ph. D. Heike Meißner
Gesellschafter	Gesellschaft für Informatik e. V., Deutschland Universität des Saarlandes, Deutschland Technische Universität Kaiserslautern, Deutschland Karlsruher Institut für Technologie (KIT), Deutschland Technische Universität Darmstadt, Deutschland Universität Stuttgart, Deutschland Universität Trier, Deutschland Johann Wolfgang Goethe-Universität Frankfurt am Main, Deutschland Institut National de Recherche en Informatique et en Automatique (INRIA), Frankreich Centrum voor Wiskunde en Informatica (CWI), Niederlande Max-Planck-Gesellschaft zur Förderung der Wissenschaften e. V., Deutschland
Einbindung	Mitglied der Leibniz-Gemeinschaft Mitglied im Leibniz-Forschungsverbund Science 2.0
Verantwortlicher Redakteur	Prof. Raimund Seidel, Ph. D.
Redaktion	Dr.-Ing. Michael Gerke, Dr. Michael Wagner
Mitarbeit	Dr. Marcel R. Ackermann, Heike Clemens, Dr. Michael Didas, Dr. Andreas Dolzmann, Jutka Gasiorowski, Dr.-Ing. Michael Gerke, Dagmar Glaser, Oliver Hoffmann, Dr. Shida Kunz, Heike Meißner, Petra Meyer, Dr. Florian Reitz, Thomas Schillo, Raimund Seidel, Ph. D., Dr. Michael Wagner und die Autoren der Zusammenfassungen in Kapitel 6
Gestaltung	in Zusammenarbeit mit le-tex publishing services GmbH, Leipzig, Deutschland
ISSN	2199-1995
Online-Version	https://www.dagstuhl.de/dagpub/2199-1995
Veröffentlichungsdatum	Juni 2021
Copyright	© Schloss Dagstuhl – Leibniz-Zentrum für Informatik GmbH
Lizenz	Creative Commons BY-ND 4.0

Leibniz Gemeinschaft

Zertifikat seit 2012 audit berufundfamilie

Vorwort
Foreword

Für das Jahr 2020 war eigentlich ein besonderes Fest zum Anlass des 30-jährigen Bestehens des LZI vorgesehen, wurde doch der Betrieb im Jahr 1990 unter dem Namen *Internationales Begegnungs- und Forschungszentrum für Informatik* aufgenommen. Aber es kam anders, und 2020 wurde auf ganz andere Weise ein besonderes Jahr für Dagstuhl. Die Grundidee, dass das zusammen Arbeiten und Leben in ungestörter physicher Nähe und die sich daraus ergebende Kommunikation zu besonderer Forschung und besonderen Ergebnissen führen, diese Grundidee von Schloss Dagstuhl erwies sich mit der Covid-19 Pandemie als sehr unkompatibel. Fast alle Veranstaltungen ab Mitte März mussten gestrichen oder verschoben werden. Einige wenige fanden in hybrider Form, also mit einigen Anwesenden und sonst elektronisch Zugeschalteten, statt.

Diese Unterbrechung im Gästebetrieb konnte für Renovierungen und Erneuerungen verwendet werden, und dblp wie auch Publikationsabteilung, die von der Pandemie sonst nicht sonderlich betroffen waren, konnten Nutznießer einiger frei gewordener Personalressourcen werden. Aber sowohl die Mitarbeiter von Dagstuhl wie auch, wie wir von ihnen hören, unsere Gäste können eine Wiederaufnahme des „Normalbetriebs“ kaum erwarten.

For the year 2020 we had planned a special event celebrating 30 years of informatics workshops in Dagstuhl. But the year turned out differently. The basic tenet of Dagstuhl, that working and living together undisturbed in close quarters and the resulting intense communication facilitate extraordinary research and extraordinary results, this tenet proved to be incompatible with the Covid-19 pandemic. Since mid March almost all of our events have had to be cancelled or postponed. A few have taken place in hybrid fashion, i.e. with a few researchers present and the rest participating remotely via some electronic means.

We could use this hiatus in our regular operations for renovations and some facelifts of our infrastructure. Also, dblp as well as our publication divison, which were otherwise barely affected by the pandemic, could take advantage of some freed up personnel resources. But certainly our staff and, from what we hear, also our guests can hardly await the resumption of “normal” operations.

Im Namen der Geschäftsführung

Prof. Raimund Seidel, Ph. D.
Wissenschaftlicher Direktor

Heike Meißner
Technisch-administrative Geschäftsführerin

On behalf of the Managing Directors

Inhaltsverzeichnis
Contents

1 Das Zentrum Schloss Dagstuhl
Schloss Dagstuhl Center

Dagstuhls Leitbild

1.1

Dagstuhl's Mission

Schloss Dagstuhl – Leibniz-Zentrum für Informatik fördert die Informatikforschung auf internationalem Spitzenniveau durch die Bereitstellung von Infrastrukturen zur wissenschaftlichen Kommunikation und für den Austausch zwischen Forschenden. Ziel von Schloss Dagstuhl ist

- die Förderung der Grundlagenforschung und der anwendungsorientierten Forschung auf dem Gebiet der Informatik,
- die wissenschaftliche Fort- und Weiterbildung im Informatikbereich,
- der Wissenstransfer zwischen Forschung und Anwendung der Informatik,
- der Betrieb einer internationalen Begegnungs- und Forschungsstätte für die Informatik.

Die Förderung und Einbindung von Nachwuchswissenschaftlern ist dabei ein wichtiger Teil dieser Aufgabe; ebenso wie der Technologietransfer zwischen Forschung und Industrie.

Schloss Dagstuhl – Leibniz-Zentrum für Informatik (Leibniz Center for Informatics) pursues its mission of furthering world class research in computer science by facilitating communication and interaction between researchers. The objective of Schloss Dagstuhl is

- to promote basic and application-oriented research in the field of informatics,
- to support advanced, scientific vocational training and to further education in the field of informatics,
- to promote the transfer of knowledge between research into informatics and application of informatics,
- and to operate an international forum and research institute for informatics.

Including and thus promoting young talents is seen as an important part of our efforts, so is promoting the exchange of knowledge and findings between academia and industry.

Entwicklung des Zentrums

Die Idee zur Gründung eines Tagungszentrum für Informatik wurde Ende der 1980er Jahre geboren, zu einem Zeitpunkt, an dem die Informatikforschung – ursprünglich der Mathematik und den Ingenieurswissenschaften entsprungen – enormen Aufwind erfuhr. Die *Gesellschaft für Informatik* beobachtete damals die zunehmende Nachfrage von Informatikwissenschaftlern am weltbekannten *Mathematischen Forschungsinstitut Oberwolfach* und sah die Notwendigkeit, ein eigens auf die Informatik ausgerichtetes Zentrum einzurichten. Schloss Dagstuhl wurde schließlich 1990 gegründet und entwickelte sich rasch zu einem weltweit renommierten Treffpunkt in der Informatikforschung. Heute beherbergt die Begegnungsstätte (siehe Fig. 1.1) normalerweise jährlich mehr als 3 000 internationale Gäste.

Seit 2005 ist Schloss Dagstuhl Mitglied in der Leibniz-Gemeinschaft, einem Verbund von 96 Forschungsinstituten, Bibliotheken und Museen.[1] Schloss Dagstuhl wird seit 2006 durch eine Bund-Länder-Förderung finanziert.

Zu dem anfänglich alleinigen Schwerpunkt des Seminarprogramms haben sich in den vergangenen Jahren zwei weitere Geschäftsfelder hinzugesellt: Zum einen der Betrieb der offenen Bibliographiedatenbank dblp, zum anderen die Angebote als Open-Access-Verleger für die Informatikforschenden.

History of the Center

The idea behind a seminar center for informatics came about during the late 1980s, when research in computer science grew rapidly worldwide as an offshoot of mathematics and engineering. At that time the German *Gesellschaft für Informatik* (German Informatics Society) became aware of the growing number of computer scientists at the world-famous *Mathematics Research Institute* in Oberwolfach, Germany, and recognized the need for a meeting venue specific to the informatics community. Schloss Dagstuhl was founded in 1990 and quickly became established as one of the world's premier centers for informatics research. Today, Schloss Dagstuhl (see Fig. 1.1) normally hosts over 3,000 research guests each year from countries across the globe.

Since 2005, Schloss Dagstuhl has been a member of the Leibniz Association, a non-profit research consortium composed of 96 research institutes, libraries and museums throughout Germany.[1] Since 2006 the center is jointly funded by the German federal and state governments.

Since the very first days of Schloss Dagstuhl, the seminar and workshop meeting program has always been the focus of its programmatic work. In recent years, Schloss Dagstuhl has expanded its operation and also has significant efforts underway in operating the dblp computer science bibliography and in open access publishing for the computer science community.

Seminar- und Workshop-Programm

Schwerpunkt des wissenschaftlichen Programms von Schloss Dagstuhl sind die Dagstuhl-Seminare und die Dagstuhl-Perspektiven-Workshops: Etwa 30 bzw. 45 internationale Forscher treffen sich eine halbe bis ganze Woche auf

Seminar and Workshop Program

The Dagstuhl Seminars and Dagstuhl Perspectives Workshops form the focus of the center's work. Whereas ca. 30 or 45 established and young researchers gather at the Dagstuhl Seminars to report on and discuss their current

[1] Stand April 2020.
As of April 2020.

Fig. 1.1
Aerial photography of Schloss Dagstuhl.

Schloss Dagstuhl, um im Rahmen eines Dagstuhl-Seminars intensiv über ihre aktuelle Forschung zu diskutieren. Darüber hinaus trifft sich in Dagstuhl-Perspektiven Workshops ein kleinere Gruppe von ca. 30 Spitzenforschern, um über den aktuellen Stand und die zukünftigen Schwerpunkte eines ganzen Forschungsfeldes zu beraten.

Die Seminare und Perspektiven-Workshops werden jeweils von bis zu vier ausgewiesenen Wissenschaftlern im entsprechenden Gebiet beantragt. Anträge werden durch das wissenschaftliche Direktorium (siehe Kapitel 11.3) begutachtet. Stellenwert bei der Begutachtung haben neben dem eigentlichen Inhalt des Antrags auch die vorgeschlagene Gästeliste sowie die Antragsteller. Nach Annahme finden die entsprechenden Veranstaltungen dann durchschnittlich zwischen 6 und 18 Monaten später statt. Eine Teilnahme ist nur mit einer persönlichen Einladung durch das Zentrum möglich.

Das Seminarzentrum ist im und rund um das 1760 erbaute Schloss Dagstuhl beheimatet und befindet sich in einer ländlichen Gegend im nördlichen Saarland, im Herzen des Dreiländerecks Deutschland, Frankreich und Luxemburg. Es bietet den Gästen eine einzigartige Arbeitsumgebung, die den Austausch mit anderen Gästen in einer wohnlichen Atmosphäre fördert. Gemütliche Sitzecken, ansprechende Essräume, eine herausragenden Informatik-Fachbibliothek, sowie eine Vielzahl von zusätzlichen Arbeits- und Freizeiträumen bieten vielfältige Möglichkeiten, damit sich Gäste auch außerhalb des fachlichen Seminarprogramms kennenlernen und austauschen können.

Nähere Informationen über Dagstuhl-Seminare und Dagstuhl-Perspektiven-Workshops finden sich in Kapitel 2.

work, smaller groups of ca. 30 of the international elite of a field gather at the Dagstuhl Perspectives Workshops for the purpose of reflecting on the current status of research and potential development perspectives.

These seminars are characterized by the fact that they are subject to an exacting quality assurance process. A small group of up to four scientists of international standing submit a proposal for a seminar on a specific research topic. The proposal is reviewed by the center's Scientific Directorate (see Section 11.3) with regard to its content, the proposed guest list and those submitting the proposal. The seminars and workshops are held 6 to 18 months later in the seclusion of the center's facilities at Dagstuhl Castle. Participation in a seminar is possible only by way of personal invitation by the center.

Located in a 1760 build manor house in the idyllic countryside of northern Saarland at the heart of the tri-country region formed by Germany, France and Luxembourg, Schloss Dagstuhl offers visitors a unique working environment that encourages guests to interact with each other in tandem with daily life. Lounges, formal and informal dining areas, a world-class research library, and an impressive range of work and leisure rooms offer multiple possibilities for connecting one-on-one outside of the official conference rooms and meeting times.

More information on the Dagstuhl Seminars and Dagstuhl Perspectives Workshops can be found in Chapter 2.

Bibliographiedatenbank dblp

Bereits seit 2011 betreibt Schloss Dagstuhl in enger Zusammenarbeit mit der Universität Trier die Bibliographiedatenbank dblp. Seit November 2018 ist Schloss Dagstuhl in vollem Umfang alleine für den Betrieb der Datenbank verantwortlich.

Mit mittlerweile mehr als 5,4 Millionen Publikationseinträgen ist dblp die weltweit größte offene Sammlung bibliographischer Daten in der Informatik. Der dblp-Dienst ist darauf ausgerichtet, Forscher bei ihrer täglichen Arbeit zu unterstützen, etwa bei der Literaturrecherche oder beim Bezug von elektronisch verfügbaren Volltexten. Dabei gilt dblp in der Informatik insbesondere als die Referenzdatenbank für qualitätsgesicherte, normierte Bibliographiedaten. Aber auch Forschungsförderer und Entscheidungsträger unterstützt dblp, etwa durch das Pflegen und öffentlich Verfügbarmachen von personalisierten Publikationsnachweisen. Durch den Betrieb von dblp leistet Schloss Dagstuhl einen weiteren Beitrag im Rahmen seiner Mission zur Förderung der Erkennung, Verbreitung und Umsetzung neuer Informatikerkenntnisse auf international anerkanntem Niveau.

Details über dblp finden sich in Kapitel 3.

Dagstuhl Publishing

Die Förderung der Kommunikation zwischen den Wissenschaftlern in der Informatik gehört zu der zentralen Aufgabe von Schloss Dagstuhl. Wissenschaftliche Veröffentlichungen sind Teil der Forschungskultur, um qualitätsgesicherte Forschungsergebnisse zu diskutieren und zu kommunizieren. Mit seinen Open-Access-Verlagsangeboten unterstützt Schloss Dagstuhl die Forschungsgemeinde dabei, freien Zugang zu den wichtigsten und neuesten Forschungsergebnissen zu erlangen.

Neben Veröffentlichungen, die in engem Bezug zum wissenschaftlichen Programm stehen, verlegt Schloss Dagstuhl auch Konferenzbände und Zeitschriften. Herausragende Reihe ist dabei LIPIcs, in der die Publikationen erstklassiger Konferenzen erscheinen. Alle Angebote der Verlagsabteilung werden durch international besetzte Editorial Boards qualitätsgesichert.

Kapitel 4 stellt Dagstuhls Verlagswesen ausführlicher dar.

dblp computer science bibliography

Since 2011, Schloss Dagstuhl has been operating the dblp computer science bibliography in close cooperation with the University of Trier. In November 2018, Schloss Dagstuhl alone assumed full responsibility for the operation of the database.

Listing more than 5.4 million articles, dblp is the world's most comprehensive open data collection of computer science research articles. The goal of dblp is to support computer scientists in their daily work, for example when reviewing the literature of a given author or subject area, or when searching for online full-text versions of research articles. The dblp database is often considered to be the reference database for quality-assured and normalized bibliographic metadata in computer science. Additionally, dblp supports funding agencies and decision makers by providing and curating personalized author bibliographies. By operating dblp, Schloss Dagstuhl furthers its mission of promoting the identification, dissemination and implementation of new computer science developments at an internationally recognized level.

More information about the dblp computer science bibliography can be found in Chapter 3.

Dagstuhl Publishing

Enabling communication between researchers in computer science is part of Dagstuhl's central mission. Scholarly publications belong to the culture of discussing and communicating quality-controlled research results on a global level. Dagstuhl's open-access publishing services hence support the need of the research community to have access to the most important and most recent research results.

In addition to the open documentation of proceedings of its seminar and workshop program, Schloss Dagstuhl also publishes proceedings for computer science conferences and journals. The flagship product of Dagstuhl Publishing is the LIPIcs series, which publishes proceedings of outstanding computer science conferences. The scientific quality of all products is supervised by international editorial boards.

More information on Dagstuhl Publishing can be found in Chapter 4.

1.2 Neuigkeiten in 2020 / *News from 2020*

Pandemie

Während die Bereiche Publishing und dblp kaum von der SARS-CoV-2 Pandemie betroffen waren und, ohne weitere Einschränkungen, vorwiegend im Homeoffice arbeiteten, war das Seminarwesen durch die vielen Auflagen und Reisebeschränkungen insbesondere für internationale Gäste stark betroffen. Näheres zum Seminarwesen und den Einschränkungen dort im Abschnitt „Seminare und Workshops“ weiter unten. Auch die Lehrerfortbildung, die Kooperation mit dem Heidelberg Laureate Forum und die

Pandemic

While the publishing and dblp departments were hardly affected by the SARS-CoV-2 pandemic and worked without any further restrictions—mainly in their home offices—the seminar department was strongly affected by the many requirements and travel restrictions, especially for international guests. More details on the seminar department and the restrictions affecting it are given in section “Seminars and Workshops” below. The teacher training, the cooperation with the Heidelberg Laureate Forum, and the

Reihe „Dagstuhler Gespräche“ mussten für 2020 ausgesetzt werden, sollen aber künftig wieder aufgenommen werden. Ebenso konnte Schloss Dagstuhl nicht seinen 30 jährigen Betrieb als Tagungszentrum für Informatik begehen – es wird sich aber sicher in den kommenden Jahren eine Gelegenheit finden, die Arbeit des Zentrums mit einem Festkolloquium entsprechend zu würdigen.

Das Team

Am Ende des Jahres 2020 beschäftigte Schloss Dagstuhl insgesamt 39,72 Vollzeitäquivalente bzw. 52 Mitarbeiter. Pandemiebedingt erfolgten in 2020 keine Neueinstellungen, aber Schloss Dagstuhl war in der Lage, alle bestehenden Verträge aufrechtzuerhalten. Im Seminarbereich konnten viele Veranstaltungen nicht stattfinden bzw. mussten verschoben werden. Die Mitarbeiter, die vorwiegend in diesem Bereich tätig sind, haben die Kollegen in den Bereichen Publikationswesen und dblp tatkräftig unterstützt.

Seminare und Workshops

Das Jahr 2020 stand für das Seminarwesen fast ganz im Zeichen der SARS-CoV-2 / Covid-19 Pandemie. Während der ersten 9 vollen Wochen fand noch der reguläre Seminarbetrieb mit den ersten pandemiebedingen Absagen von Teilnehmern statt. Vom 8. bis 13. März fand noch eines von zwei geplanten Seminaren aber mit nur 15 von ursprünglich 42 Teilnehmern statt. Aufgrund der Entwicklung und dem drohenden Shutdown schloss darauf folgend das Zentrum vom 15. März bis 15. August und alle in dieser Zeit geplanten Veranstaltungen konnten nicht stattfinden.

Ab dem 15. August steht das Zentrum, dank eines behördlich genehmigten Hygienekonzepts, Seminaren und interessierten Gruppen wieder offen. Durch die zahlreichen Reisebeschränkungen, seien sie amtlich oder durch Auflagen der Arbeitgeber, konnten dennoch nur drei der geplanten Dagstuhl Seminare sowie einige, teils neu eingeworbene Gruppentreffen von Forschern stattfinden. Bei manchen der Veranstaltung wurden auch auswärtige Seminarteilnehmer mittels Videokonferenztechnik hinzugenommen. Diese ersten Veranstaltungen im Hybridformat haben mit ihrer Pionierarbeit die Entwicklung dieses Seminarformats ermöglicht, da Schloss Dagstuhl viel aus diesen Pilotveranstaltungen lernen konnte. Dankenswerter Weise haben uns auch die Organisatoren ihre Erfahrungen mitgeteilt, so haben zum Beispiel im Nachgang zum ersten Seminar im Hybridformat die Organisatoren ihre Erfahrungen und Tipps und Tricks für künftige Veranstaltungen aufgeschrieben und uns und nachfolgenden Veranstaltungen zur Verfügung gestellt.

Die während der Schließzeit geplanten dreißig Seminare wurden auf neue Termine in 2021 verschoben. Die ebenfalls 30 abgesagten oder unter erheblichen Einschränkungen stattfindenden Seminare im Rest des Jahres konnten in einer geschlossenen Antragsrunde ab November 2020 einen Antrag auf einen neuen Termin stellen.

Insgesamt betrachtet ist der Seminarbereich von Schloss Dagstuhl im Jahr 2020 durch die Pandemie auf 1/5 des Vorjahres geschrumpft.

“Dagstuhler Gespräche” (Dagstuhl Talks) series had to be suspended for 2020. It is planned to resume them in the future. Likewise, Schloss Dagstuhl was not able to celebrate its 30th year of operation as a meeting center for informatics research—but there will certainly be an opportunity in the coming years to appropriately honor the work of the center with a celebratory colloquium.

The Team

By the end of 2020, Schloss Dagstuhl had a total of 52 staff members corresponding to 39.72 full-time positions. Due to the pandemic, we did not hire during 2020, but we were able to retain all staff. Many events could not take place or had to be postponed; the staff that usually takes care of events supported the colleagues working in publishing and dblp.

Seminars and Workshops

For the seminar department, the year 2020 was almost entirely dominated by the SARS-CoV-2 / Covid-19 pandemic. During the first 9 full weeks, the seminars still took place regularly with the first pandemic-related cancellations by participants. From March 8 to 13, just one of two planned seminars took place but with only 15 of the 42 originally planned for participants. Due to the developments and the impending shutdown, the center closed from March 15 to August 15 and none of the events scheduled during this time could take place.

Since August 15, thanks to an officially approved hygiene concept, the center is once again open to seminars and interested groups. Due to the numerous travel restrictions, whether official or imposed by employers, it was nevertheless only possible to hold three of the planned Dagstuhl Seminars as well as some research-group meetings, some of which were newly solicited. For several of the events, off-site seminar participants were also included by means of videoconferencing technology. These first pioneering events in the hybrid format made further development of this seminar format possible, as Schloss Dagstuhl was able to learn a great deal from these pilot events. Thankfully, the organizers also shared their experiences with us. For example, in the follow-up to the first seminar using the hybrid format, the organizers wrote down their experiences as well as tips and tricks for future events and made them available to us and subsequent events.

The thirty seminars scheduled during the closure period were rescheduled for new dates in 2021. The further 30 seminars that were canceled or held under significant restrictions during the rest of the year were able to apply for a new date in a closed application round in November 2020.

Overall, Schloss Dagstuhl’s seminar and meeting activity in 2020 has shrunk to 1/5 of the previous year’s level due to the pandemic.

Die zweite Antragsrunde des Jahres wurde pandemiebedingt um 3 Monate nach hinten verschoben. Erfreulicherweise gab es in dieser Runde mit 92 Anträgen so viele Anträge wie im ganzen 30jährigen Bestehen nicht vorher. Ein mutmachendes Zeichen, dass trotz der nun stets benutzten Videokonferenzen nach der Pandemie auch das Treffen in Schloss Dagstuhl einen hohen Stellenwert haben wird.

Mehr Details und Zahlen zum Seminarprogramm finden sich in Kapitel 2.

Bibliographiedatenbank dblp

Auch im vergangenen Jahr konnte das dblp-Team – trotz der erforderlichen Homeoffice-Regelungen – erfolgreich an der weiteren Verbesserung der Datenbank arbeiten. So war 2020 das Jahr des stärksten Wachstums in der Geschichte des Projekts. Innerhalb von zwölf Monaten wurden mehr als 500 000 neue Publikationen aufgenommen. Dies entspricht etwa 2 000 neuen Publikationen pro Arbeitstag, die von unseren Redakteuren geprüft und der passenden Bibliographie zugeordnet werden. Bei gleichbleibender Anzahl an Kuratoren konnte die Anzahl der manuellen Korrekturen an bestehenden Bibliographien auf mehr als 60 000 erhöht werden. Auch die Nutzung von dblp stieg erneut an. Inzwischen registrieren die dblp-Webseiten im Schnitt mehr als 1,2 Millionen Seitenzugriffe pro Tag. Jeden Monat nutzen mehr als eine Million verschiedene Nutzern aus aller Welt unsere Server.

Gleichzeitig konnten die Leistungsmerkmale der Webdienste weiter ausgebaut und verbessert werden. Insbesondere konnte 2020 ein System zuverlässiger Identifier für Bibliographien in Betrieb genommen werden. Dieses System wird die Weiternutzung der dblp-Daten und die Integration mit anderen Datensätzen vereinfachen. Wie bereits zuvor war dblp selbst Gegenstand zahlreicher weltweiter Studien. Dies unterstreicht erneut die Bedeutung des Datensatzes für das Verständnis der Informatik-Community.

Im Mai 2020 wurde Michael Ley für die Gründung und Betreuung von dblp mit dem angesehenen ACM Distinguished Service Award ausgezeichnet.

Mehr Details zu dblp finden sich in Kapitel 3.

Dagstuhl Publishing

Wie in den Vorjahren haben die Open-Access-Publikationsaktivitäten auch in 2020 starken Zuspruch bekommen. So wurden in den Konferenzbandreihen LIPIcs und OASIcs zusammen 1 484 Publikationen innerhalb eines Jahres veröffentlicht. Zudem gab es auch in 2020 wieder viele Bewerbungen von wissenschaftlichen Konferenzen zur Veröffentlichung des Konferenzbandes in der Serie LIPIcs. Zudem wurde das im Vorjahr eingeführte Einreichungssystem weiterentwickelt, welche die Arbeiten für Herausgeber, Editoren aber auch das Verlagsteam deutlich vereinfacht.

Mehr Informationen zu den Open-Access-Aktivitäten von Schloss Dagstuhl finden sich in Kapitel 4.

The second application round of the year was postponed by 3 months due to the pandemic. Fortunately, with 92 applications, there were more applications in this round than in any other during the entire 30 years of the center's existence. This is an encouraging sign that despite the constant use of video conferences, meeting in Schloss Dagstuhl will continue to be of great importance after the pandemic.

See Chapter 2 for more details and statistics regarding the seminar program.

dblp Computer Science Bibliography

During the past year – despite homeoffice requirements – the dblp team has successfully continued its work to improve the database. 2020 has been the year of the strongest growth in the history of the project. Within twelve month more than 500,000 new publications were added. This figure corresponds to about 2,000 added publications per working day which have been checked and assigned to a bibliography by our editors. With a stable team of curators, the number of corrections of the existing data could be increased to more than 60,000. Usage of dblp also continues to increase. On average, the dblp website saw more than 1.2 million page impressions per day. Every month our servers received requests from more than one million different users from all over the world.

At the same time, new features have been added to dblp's web services. Most notably, 2020 saw the introduction of a stable identifier system for bibliographies. This will improve the reusability of dblp and its integration with other data sets. As before, dblp itself has been studied extensively by researchers worldwide underlining its importance in understanding the computer science community.

In May 2020, Michael Ley received the prestigious ACM Distinguished Service Award for creating and maintaining dblp.

More details about dblp can be found in Chapter 3.

Dagstuhl Publishing

As in the previous years, Schloss Dagstuhl's open-access publishing services experienced an on-going strong increase in demand from the community in 2020. So in the conference proceedings series LIPIcs and OASIcs together 1,484 publications were published within one year. Furthermore, LIPIcs again received and accepted proposals from several major scientific conferences. In addition, the submission system introduced in the previous year was further developed, which significantly simplifies the work for editors and the publishing team.

More information about the Open Access activities of Schloss Dagstuhl can be found in Chapter 4.

Spender und Förderer

Schloss Dagstuhl ist den wissenschaftlichen Gästen, Institutionen und Firmen dankbar, die durch großzügige Spenden das Zentrum unterstützen.

2020 erhielt die Bibliothek von mehreren Verlagshäusern erneut zahlreiche Buchspenden. Insgesamt erhielt das Zentrum im Berichtszeitraum 617 Bände als Spende, darunter 590 Monographien des Springer-Verlags im Wert von 46 646 €.

Schloss Dagstuhl wurde 2020 durch verschiedene Kunstspenden unterstützt.

Baumaßnahmen und Renovierung

Die Wärmeschutzmaßnahmen in der Decke des sogenannten „Neubaus“ wurden Anfang 2020 erfolgreich beendet. Durch die gleichzeitige Anbringung von Netzwerkverkabelung wurde die Voraussetzung dafür geschaffen, zu einem späteren Zeitpunkt die Internet-Verbindung im Gebäude erheblich zu verbessern.

In den Betriebsferien wurden insgesamt vier Bäder saniert und notwendige Malerarbeiten im ganzen Institut durchgeführt.

Ende 2020 wurde ein Plattformlift im rückwärtigen Bereich der Weinstube eingebaut, um diesen Bereich barrierefrei zu erschließen. Im Zuge dieser Maßnahme war es notwendig, den Außenbereich des Plattformliftes zu pflastern und eine geeignete Wege-Beleuchtung anzubringen.

Nachdem bereits 2019 eine behindertengerechte Eingangstür eingebaut wurde, folgte in 2020 die Pflasterung des Eingangsbereiches sowie die Neuverlegung der Elektrik im Boden, um eine geeignete Beleuchtung anzubringen. Somit ist nun ein behindertengereichter, „stolperfreier“ und ausreichend beleuchteter Zugang zum Gebäude geschaffen.

Ausstattung

Die neue Schließanlage wurde zum 01.01.2020 freigeschaltet. Dies ermöglicht allen Gästen nun, ihre Zimmer auch von außen abzuschließen, was bis dahin aufgrund der Open-Door-Policy von Schloss Dagstuhl nicht vorgesehen war. Gleichzeitig wurde ein Self-Check-In-Terminal installiert, um den Gästen das Einchecken und den Zugang zum Gästezimmer auch außerhalb der Öffnungszeiten zu ermöglichen.

Um Seminare in einem hybriden Format, also mit einer Mischung aus Teilnehmenden vor Ort und per Videoconferenztechnologie Teilnehmenden, uneingeschränkt zu ermöglichen, wurden in einem ersten Schritt in zwei Hörsälen Deckenmikrophone installiert. Durch Lieferengpässe wird die Einrichtung der Technik aber erst im Laufe des Jahres 2021 fertiggestellt werden können.

Sponsors and Donors

Schloss Dagstuhl is grateful to its scientific guests and institutional colleagues for generous donations for the support of its center.

The center's research library received a large number of book donations from several publishing houses. The number of donated volumes totaled 617, including 590 monographs at the total value of 46,646 € donated by Springer Science+Business Media publishing house.

Schloss Dagstuhl was supported by various art donations in 2020.

Construction Work and Renovation

The improvement of the thermal insulation of the ceilings in the so called "new building" were successfully completed in early 2020. Using this opportunity to install network cabling laid the groundwork to later improve the internet access in the building substantially.

During the vacation close-down, four bathrooms were refurbished and necessary paintwork all over the institute was performed.

In late 2020, a platform lift was installed at the back of the wine cellar to make it handicapped accessible. In the course of this project, it was necessary to pave the surrounding of the platform lift and install suitable path lighting.

After the installation of a handicapped accessible automatic sliding front door in 2019, paving the entry area and installing new power cabling underground to support suitable lighting followed in 2020. Thus, a handicapped accessible, "no-trip", sufficiently illuminated access to the building was created.

Facilities

The new locking system was activated on January 1, 2020. This allows all Guests to lock their guest rooms' doors from the outside as well, which was not arranged for formerly under Schloss Dagstuhl's Open-Door-Policy. At the same time, a self-check-in terminal was installed to enable our guests to check in and access their guest rooms outside of business hours.

In order to enable seminars in a hybrid format unrestrictedly, i.e., with a mix of on-site participants and remote participants, ceiling microphones have been installed in two lecture halls as a first step. Due to supply bottlenecks, however, the setup of the technology will only be completed in the course of 2021.

Fig. 1.2
Staff members of Schloss Dagstuhl sew masks: At the beginning of April, 2020, during the temporary closure of our meeting center due to the pandemic, staff members of Schloss Dagstuhl got involved with the community: they sewed masks for the district and for all staff members.

2 Seminare und Workshops
Seminars and Workshops

2.1 Dagstuhl-Seminare

Die Dagstuhl-Seminare haben als wesentliches Instrument der Forschungsförderung Priorität bei der Gestaltung des Jahresprogramms. Hauptziel der Seminare ist die Unterstützung der Kommunikation und des Dialogs zwischen Wissenschaftlern, die an den Forschungsfronten von miteinander verknüpften Forschungsfeldern in der Informatik arbeiten. Die Seminare ermöglichen die Vorstellung neuer Ideen, die Diskussion von aktuellen Problemen sowie die Weichenstellung für zukünftige Entwicklungen. Sie bieten außerdem die Möglichkeit zum Austausch zwischen vielversprechenden Nachwuchswissenschaftlern und internationalen Spitzenforschern in einem speziellen Forschungsgebiet.

Die Teilnahme an den üblicherweise einwöchigen Seminaren ist nur auf persönliche Einladung durch Schloss Dagstuhl möglich. Das Zentrum übernimmt einen Teil der Kosten, sodass die besten Wissenschaftler einschließlich junger Forscher und Doktoranden teilnehmen können. Zu den ehemaligen Gästen zählen 26 Preisträger des Turing-Awards, der höchsten Auszeichnung, die im Bereich der Informatik auf internationaler Ebene verliehen wird.

Charakteristisch für Dagstuhl ist die Etablierung von richtungsweisenden sowie gebietsübergreifenden Seminaren. Manche Themen, die ausgiebig in Dagstuhl diskutiert wurden, entwickelten sich anschließend zu sehr aktiven Forschungsbereichen, die teilweise zu DFG-Schwerpunkten und anderen Förderprogrammen führten. Bei einer Reihe von Forschungsgebieten wurden durch Dagstuhl-Seminare Gruppen zusammengeführt, die zwar an verwandten Problemen und Verfahren forschen, denen aber bisher keine gemeinsame Diskussionsplattform zur Verfügung stand. Dies gilt insbesondere auch für Disziplinen, die nicht zur Informatik gehören. Wichtige Forschungsgebiete, für die in Dagstuhl bereits mehrfach eine intensive Zusammenarbeit mit der Informatik erschlossen und vertieft wurde, sind Biologie (seit 1992) und Sport (seit 2006). Die Themen der Dagstuhl-Seminare bieten eine hervorragende und sehr breite Übersicht über die aktuellen Forschungsgebiete der Informatik.

Jedes Dagstuhl Seminar wird gebeten, einen kurze Dokumentation zu erstellen, die eine Zusammenfassung des Seminarverlaufs, eine Kurzübersicht über die gehaltenen Vorträge und eine Zusammenfassung grundsätzlicher Ergebnisse enthält. Diese Berichte, die in der Zeitschrift *Dagstuhl Reports* veröffentlicht werden, gewährleisten eine hohe Sichtbarkeit und eine zeitnahe Kommunikation der Ergebnisse. Dagstuhl Reports wird jährlich in einem Band mit 12 Ausgaben veröffentlicht. Jede Ausgabe dokumentiert jeweils die Dagstuhl-Seminare und Dagstuhl-Perspektiven-Workshops eines Monats. Die Dagstuhl Reports sind über die Dagstuhl-Website frei zugänglich.[2]

Kapitel 6 enthält Zusammenfassungen der Dagstuhl-Seminare und Perspektiven-Workshops. Im Kapitel 14 sind alle Veranstaltungen, die 2020 stattfanden, aufgelistet. Auf der Dagstuhl-Website ist das Programm der kommenden 24 Monate verfügbar.

2.1 *Dagstuhl Seminars*

Dagstuhl Seminars, the center's key instrument for promoting research, are accorded top priority in its annual program. The central goal of the Dagstuhl Seminar program is to stimulate new research by fostering communication and dialogue between scientists working on the frontiers of knowledge in interconnected fields related to informatics. New ideas are showcased, topical problems are discussed, and the course is set for future development in the field. The seminars also provide a unique opportunity for promising young scientists to discuss their views and research findings with the international elite of their field in a specific cutting-edge field of informatics.

Participation in these events – which generally last one week – is possible only by way of personal invitation from Schloss Dagstuhl. The center assumes part of the associated costs in order to enable the world's most qualified scientists, including young researchers and doctoral students, to participate. Among Dagstuhl's guests have been 26 winners of the ACM Turing Award, the highest achievable award within the international computer science community.

Dagstuhl's distinguished accomplishment is to have established pioneering, interdisciplinary seminars that have virtually become institutions themselves. Many of the topics addressed in-depth at Dagstuhl have subsequently developed into highly active research fields, resulting in some cases in DFG priority programs and other grant and funding programs. Dagstuhl Seminars often succeed in bringing together scientists from a range of research areas and disciplines whose work overlaps with respect to issues, methods and/or techniques, but who had never previously entered into constructive dialogue with one another. This especially applies to disciplines outside of the field of informatics. Key research areas for which in-depth collaboration with informatics specialists was initiated and consolidated at Dagstuhl include biology (since 1992) and sports (since 2006). The spectrum of seminar topics provides an excellent and broad overview of the areas currently under discussion in the informatics arena.

Each Dagstuhl Seminar is asked to contribute a record of the seminar proceedings in the form of a Dagstuhl Report. The report gives an overview of the seminar's program, talks, and results in a journal-like manner to allow for a high visibility and timely communication of its outcome. The periodical *Dagstuhl Reports* is published in one volume with 12 issues per year; each issue documents the Dagstuhl Seminars and Dagstuhl Perspectives Workshops of a given month. Dagstuhl Reports are openly accessible and can be downloaded at the Dagstuhl website.[2]

Chapter 6 contains a collection of the summaries of the 2020 Seminars and Perspectives Workshops. Chapter 14 provides a comprehensive list of all events that took place during the year under review, and a seminar program covering the coming 24 months is available on the Dagstuhl website.

[2] https://www.dagstuhl.de/dagrep/

Dagstuhl-Perspektiven-Workshops

2.2

Dagstuhl Perspectives Workshops

In Ergänzung zu den Dagstuhl-Seminaren werden Dagstuhl-Perspektiven-Workshops veranstaltet, bei denen 25–30 ausgewiesene Wissenschaftler ein bereits fest etabliertes Forschungsgebiet betreffende Tendenzen und neue Perspektiven der weiteren Entwicklung dieses Gebietes diskutieren. Im Gegensatz zu Dagstuhl-Seminaren werden statt aktueller Forschungsergebnisse im Wesentlichen Positionspapiere vorgetragen, welche den aktuellen Stand des Gebietes, offene Probleme, Defizite und vielversprechende Richtungen beschreiben. Der Fokus in den Workshops liegt auf Teilgebieten oder mehreren Gebieten der Informatik. Jeder Workshop hat zum Ziel

- den Stand eines Gebietes zu analysieren,
- Potenziale und Entwicklungsperspektiven bestehender Forschungsfelder zu erschließen,
- Defizite und problematische Entwicklungen aufzudecken,
- Forschungsrichtungen aufzuzeigen und
- Innovationsprozesse anzustoßen.

Aufgrund der SARS-CoV-2 Pandemie konnten die für 2020 geplanten Dagstuhl-Perspektiven Workshops leider nicht stattfinden.

Die Ergebnisse der intensiven Diskussionen werden in einem Manifest zusammengefasst, welches die offenen Probleme und die möglichen Forschungsperspektiven für die nächsten 5–10 Jahre aufzeigt. Dagstuhl koordiniert die gezielte Weitergabe dieses Manifests, um forschungsspezifische Impulse an deutsche und europäische Institutionen der Forschungsförderung zu geben (EU, BMBF, DFG, etc.). Kurzfassungen der Manifeste werden regelmäßig im Forum des *Informatik Spektrum* (Springer-Verlag) vorgestellt. Die vollständigen Manifeste werden in unserer Fachzeitschrift Dagstuhl Manifestos[3] veröffentlicht.

Eine Liste der vergangenen und kommenden Dagstuhl-Perspektiven-Workshops ist auf der Dagstuhl-Website verfügbar.[4]

In addition to the traditional Dagstuhl Seminars, the center organizes Dagstuhl Perspectives Workshops. A Perspectives Workshop involves 25–30 internationally renowned senior scientists who wish to discuss strategic trends in a key research area that is already well established and to develop new perspectives for its future evolution. In contrast to Dagstuhl Seminars, Perspectives Workshops do not address current research results but reflect the overall state of a field, identifying strengths and weaknesses, determining promising new developments, and detecting emergent problems and synergies. The workshops tend to focus on subfields or are interdisciplinary in nature, thus covering more than one informatics field. Each workshop aims to:

- contribute to an analysis of the present status of a field
- tap into potentials and development perspectives of existing fields of research
- detect shortcomings and problematic developments
- show research directions
- trigger innovation processes

Due to the SARS-CoV-2 pandemic, the Dagstuhl Perspectives Workshops scheduled for 2020 could not take place.

The results of the in-depth discussions of each workshop are presented in a manifesto detailing open issues and possible research perspectives in that specific field for the coming 5–10 years. Schloss Dagstuhl coordinates the targeted dissemination of this manifesto as research policy impulses to German and other European research donors and sponsors (EU, German Federal Ministry of Education and Research, DFG, etc.). Short versions of the manifestos are regularly presented in a forum of the *Informatik Spektrum* journal (published by Springer); full versions of the manifestos are published in our periodical Dagstuhl Manifestos[3].

A list of past and upcoming Dagstuhl Perspectives Workshop can be found on our web site.[4]

[3] https://www.dagstuhl.de/dagman
[4] https://www.dagstuhl.de/pw-list

2.3 Einreichung der Anträge und Begutachtungsverfahren

Die gleichbleibend hohe Qualität der Dagstuhl-Seminare und Dagstuhl-Perspektiven-Workshops wird durch Auswahl der Anträge gewährleistet, die aus Sicht von Schloss Dagstuhl das größte Potential haben, abseits etablierter Konferenzen neue und wichtige Forschungsprobleme mit Wissenschaftlern aus oft unterschiedlichen Gebieten zu identifizieren und zeitgleich mögliche Methoden und Lösungsansätze zu diskutieren.

Das Zentrum erbittet zweimal im Jahr Themenvorschläge von führenden Wissenschaftlerinnen und Wissenschaftlern aus der ganzen Welt, die ihre Seminaranträge zusammen mit einer vorläufigen Teilnehmerliste einreichen. Die Anträge werden dann vom Wissenschaftlichen Direktorium (siehe Kapitel 11.3) begutachtet und abschließend bei zweitägigen Sitzungen auf Schloss Dagstuhl intensiv diskutiert und über sie entschieden.

Es wird sicher gestellt, dass jedes Dagstuhl-Seminar durch ein starkes Organisatorenteam betreut wird, ein für die Informatik-Community relevantes Thema anspricht, ein kohärentes und gut strukturiertes wissenschaftliches Programm präsentiert und eine Gruppe von geeigneten Teilnehmerinnen und Teilnehmern zusammenbringt, deren kollektive Fachkenntnis einen bedeutenden Durchbruch in dem betreffenden Forschungsfeld ermöglichen kann. Zudem wird auf eine ausgeglichenen Repräsentation wissenschaftlicher Gemeinden, geographischer Regionen und besonders auf das Miteinbeziehen junger und weiblicher Wissenschaftler geachtet.

Die Informatikforscher zeigten 2020 wieder ein hohes Interesse am Organisieren von Dagstuhl-Seminaren und Dagstuhl-Perspektiven-Workshops durch die Einreichung von insgesamt 153 Anträgen in den Antragsrunden im Januar und September 2020. Der hohen Qualität der Anträge entsprechend wäre es unmöglich gewesen, allen Seminaren einen Termin in den nächsten 2 Jahren anzubieten, wenn zu viele Anträge angenommen worden wären. Durch den deshalb sehr harten Wettbewerb wurden etwa 57 % der eingereichten Anträge genehmigt. In den vergangenen 7 Jahren variierte die Rate der angenommen Anträge zwischen 56 % und 69 %(siehe Fig. 2.1).

Unter den 87 in 2020 neu genehmigten Dagstuhl-Seminaren und Dagstuhl-Perspektiven-Workshops gab es wie in den vergangenen Jahren wieder verschiedene Konstellationen bzgl. Dauer und Größe (vgl. Fig. 2.2). Von diesen waren 12 Seminare für 2020 eingeplant, wovon aber nur zwei stattfinden konnten (hier und im Folgenden wird, sofern nicht anders angegeben, das Wort “Seminar” sowohl für Dagstuhl-Seminare als auch für Dagstuhl-Perspektiven-Workshops verwendet). Die 2020 neu genehmigten Seminare haben Termine in den Jahren 2020, 2021 und 2022 erhalten, aber pandemiebedingt werden einige davon später stattfinden.

2.3 *Proposal Submission and Review Process*

Schloss Dagstuhl maintains the high quality of the Dagstuhl Seminar and Dagstuhl Perspectives Workshop series by identifying those proposals that promise a high potential to engage researchers – often from different disciplines – in scientific discussions on new and important research problems and their most promising solutions, outside of the existing conferences.

The center solicits topics for new seminars and workshops twice a year from leading researchers worldwide, who submit their proposals together with a list of potential scientists to be invited. The proposals and suggested invitee lists are then reviewed by Dagstuhl’s Scientific Directorate (see Section 11.3) and finally discussed and decided during a two-day meeting at Schloss Dagstuhl.

This process ensures that every Dagstuhl Seminar and Dagstuhl Perspectives Workshop is backed by a strong team of organizers, addresses a topic of relevance to the computer science community, presents a coherent and well-structured scientific agenda, and brings together the right group of participants whose collective expertise can lead to a significant breakthrough in the area to be addressed. The balance of research communities and geographical regions, and especially the inclusion of junior and female researchers, are also taken into account during the review process.

The international scientific community expressed a lively interest in organizing seminars and workshops at Schloss Dagstuhl in 2020, submitting 153 proposals for Dagstuhl Seminars and Dagstuhl Perspectives Workshops during the January 2020 and September 2020 submission rounds. The quality of the proposals was excellent, however, it would not have been possible to guarantee that all seminars could be scheduled during the next two years if too many proposals were accepted. Consequently, the competition was very hard, resulting in a 57 % acceptance rate by Dagstuhl’s Scientific Directorate. In the previous seven years, proposal acceptance rates have tended to range between 56 % and 69 % (see Fig. 2.1).

Among the 87 Dagstuhl Seminars and Dagstuhl Perspectives Workshops accepted in 2020 there is – as in the past years – a wide variation with regard to length and size (see Fig. 2.2). Of these seminars, 12 were scheduled to take place in 2020 already, but only two could actually take place (here and in the following, the word "seminar" is meant to include both Dagstuhl Seminars and Dagstuhl Perspektives Workshops, if not specified otherwise). The seminars accepted in 2020 were scheduled in 2020, 2021, and 2022, but due to the pandemic, some of them will take place at later dates.

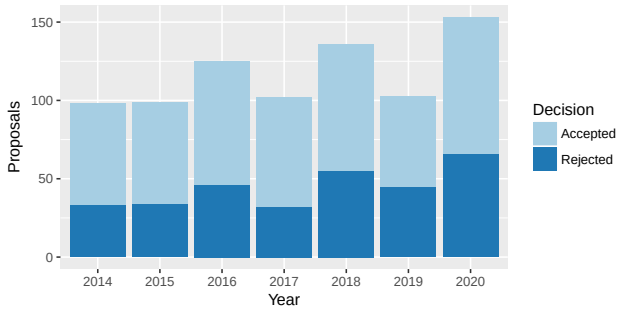


Fig. 2.1
Overview of proposed and accepted Dagstuhl Seminars and Dagstuhl Perspectives Workshops in 2014–2020.

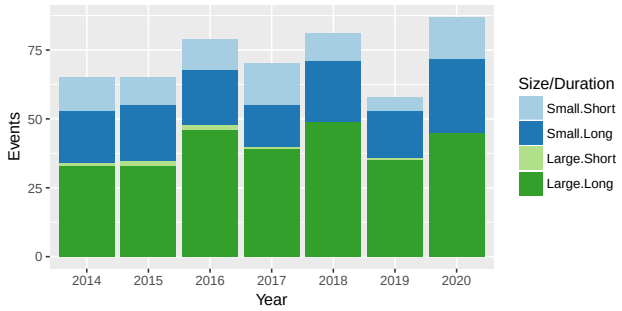


Fig. 2.2
Size and duration of Dagstuhl Seminars and Dagstuhl Perspectives Workshops accepted in 2014–2020.
Small = 30-person seminar, Large = 45-person seminar, Short = 3-day seminar, Long = 5-day seminar.

Seminar-Programm 2020

2.4 *The Seminar Program in 2020*

Hier und im Folgenden ist zu beachten, dass durch die pandemiebedingte Reduzierung der Aktivitäten des Tagungszentrums die Zahlen nicht mit den Zahlen der Vorjahre vergleichbar sind.

Grundsätzlich kann Schloss Dagstuhl in jeder Woche zwei Seminare mit insgesamt etwa 75 Teilnehmern beherbergen.

In 13 von 28 Wochen, in denen das Tagungszentrum 2020 geöffnet war, fand mindestens ein Dagstuhl-Seminar oder Dagstuhl-Perspektiven-Workshop statt. In 9 Wochen war das Zentrum nur durch andere Veranstaltungen belegt. In 6 Wochen fand keine Veranstaltung statt. Es gab allerdings einen Forschungsaufenthalt während der pandemiebedingten Schließung des Zentrums.

2020 fanden insgesamt 13 Dagstuhl-Seminare und Dagstuhl-Perspektiven-Workshops statt. In Fig. 2.3 ist die Entwicklung der vergangenen Jahre dargestellt.

It should be noted here and in the following that due to the pandemic-induced reduction in the activities of the meeting center, the figures are not comparable with those of previous years.

In principle, Schloss Dagstuhl can host two seminars each week with a total of about 75 participants.

At least one Dagstuhl Seminar or Dagstuhl Perspectives Workshop was held in 13 of the 28 weeks the center was open in 2020. In 9 weeks, there were exclusively other events scheduled. in the remaining 6 weeks, no events took place. There was, however, one research stay during the time the center was closed due to the pandemic.

Altogether, there were 13 Dagstuhl Seminars and Dagstuhl Perspectives Workshops in 2020. Fig. 2.3 shows the evolution in recent years.

Angaben zu Teilnehmern und Organisatoren

2.5 *Participant and Organizer Data*

Hier und im Folgenden ist zu beachten, dass pandemiebedingt die Anzahl der Gäste sehr niedrig war. Aufgrund der geringen Stichprobengröße sind alle statistischen Angaben erheblichen Schwankungen unterworfen und daher von geringer Aussagekraft.

Von den mehr als 656 Gästen, die sich in Dagstuhl trafen, nahmen 419 an Seminaren teil.

It should be noted here and in the following that, due to the pandemic, the number of guests was very low. Due to the small sample size, all statistical data are subject to considerable variance and are therefore of little significance. Of the more than 656 guests who met in Dagstuhl, 419 took part in seminars.

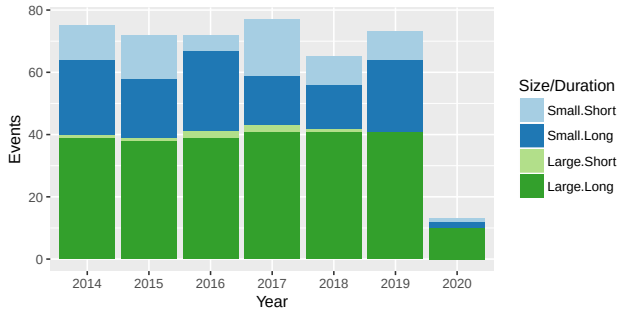


Fig. 2.3
Size and duration of Dagstuhl Seminars and Dagstuhl Perspectives Workshops held in 2014–2020.
Small = 30-person seminar, large = 45-person seminar, short = 3-day seminar, long = 5-day seminar.

Viele der internationalen Teilnehmer der Seminare waren schon öfter in Dagstuhl. Dennoch zieht das Zentrum jedes Jahr auch neue Gesichter an, was den ständigen Wandel in der Forschung widerspiegelt. So nahmen in 2020 etwas über ein Drittel (36 %, 150 von 418) der Wissenschaftler das erste Mal an einem Dagstuhl-Seminar oder Dagstuhl-Perspektiven-Workshop teil, während weitere 15 % der Wissenschaftler an nur einem Seminar in den Jahren vorher teilgenommen hatten, weitere 13 % nur an zweien. Ein wenig andere Zahlen leiten sich aus unserer Gastumfrage ab. Hier ergibt sich, dass etwa 29 % der Antwortenden 2020 das erste Mal, 15 % zum zweiten Mal und weitere 12 % zum dritten Mal (siehe Fig. 2.4a) teilgenommen haben.

Ein beträchtlicher Anteil der Gäste besteht aus jungen Wissenschaftlern, die am Anfang ihrer Karriere stehen, und für die der Aufenthalt in Dagstuhl oftmals prägend ist für den weiteren Verlauf ihres Lebenswegs. Etwa 29 % der Gäste der Dagstuhl-Seminare und Dagstuhl-Perspektiven-Workshops in 2020, die an unserer Umfrage zur Qualitätskontrolle teilgenommen haben, stuften sich selbst als Nachwuchswissenschaftler ein (siehe Fig. 2.4b). Das liegt leicht unter der normalerweise mit etwa einem Drittel etwas ausgewogeneren Verteilung zwischen Nachwuchswissenschaftlern und erfahrenen Forschern, die im Laufe der Jahre relativ konstant geblieben war, was die Bemühungen des Zentrums zur Aufrechterhaltung der „Dagstuhl-Verbindung“ zwischen herausragenden jungen Wissenschaftlern und ihren erfahrenen Kollegen zeigt.

Mit 69 % war der Anteil von Seminarteilnehmern aus dem Ausland 2020 niedriger als in den Vorjahren. Das Diagramm in Fig. 2.4c zeigt die regionale Verteilung der Gäste für 2020 bei Dagstuhl-Seminaren und Dagstuhl-Perspektiven-Workshops. Mehr Details können Kapitel 13 entnommen werden.

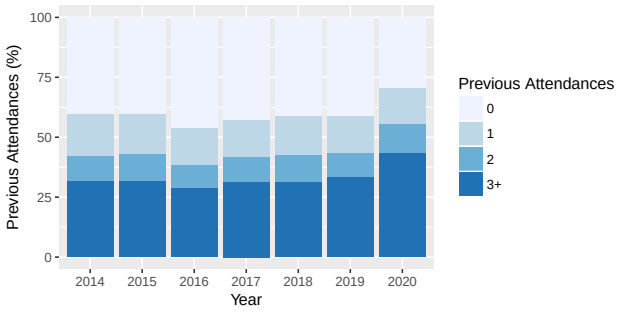
In 2020 waren etwa 80 % aller Organisatorenteams des Seminar-Programms hinsichtlich des Geschlechts gemischt und rund 25 % aller Organisatoren waren Frauen (siehe Fig. 2.5a). Der Anteil an weiblichen Seminarteilnehmern war mit 22,2 % höher als in den Jahren vor 2019, was dem Trend seit 2018 entspricht (siehe Fig. 2.5b).

Participants in Dagstuhl Seminars come from all over the world, and a significant number of them choose to repeat the experience. Nevertheless, we see many fresh new faces every year, reflecting the changing informatics research across the globe. In 2020, a bit more than a third (150 of 418, or 36 %) of the researchers were first-time visitors to Dagstuhl. About an additional 15 % of the participating researchers had already attended one previous seminar in the years before, and another 13 % had already attended two. Slightly different numbers are obtained from our guest survey: About 29 % of the responders were first-time visitors, an additional 15 % state their second visit, and yet another 12 % their third (see Figure 2.4a).

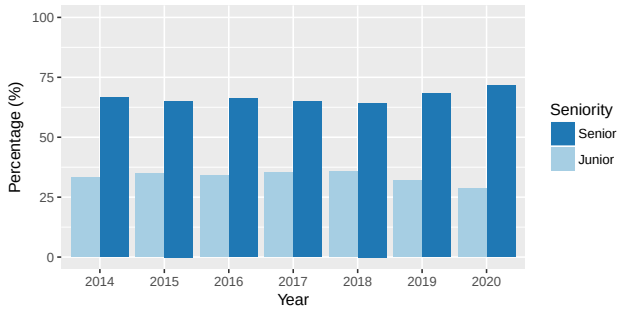
A substantial number of these guests were young researchers at the start of their careers, for whom the Dagstuhl experience can be of lifelong value. Approximately 29 % of 2020 Dagstuhl Seminar and Dagstuhl Perspectives Workshop survey respondents self-classified as junior (see Fig. 2.4b). This is slightly below the usual proportion of junior to senior researchers of about a third, which had remained relatively constant over the years, reflecting the center's determined effort to maintain the "Dagstuhl connection" between brilliant junior scientists and their senior colleagues.

At around 69 %, the proportion of seminar and workshop guests with a non-German affiliation in Dagstuhl Seminars was lower than in the previous years. The chart in Fig. 2.4c shows the regional distribution of our Dagstuhl Seminar and Dagstuhl Perspectives Workshop guests in 2019. For a detailed breakdown please refer to Chapter 13.

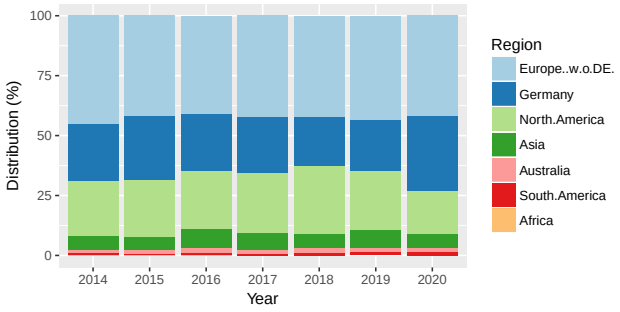
In 2020, 80 % of all organizer teams in our scientific seminar program were mixed with respect to gender and about 25 % of all organizers were women (see Fig. 2.5a). The percentage of female seminar participants was higher than in the years previous to 2019, at 22.2 %, continuing the trend from 2018 (see Fig. 2.5b).



(a) Distribution of the number of previous attendances of participants, according to survey data.

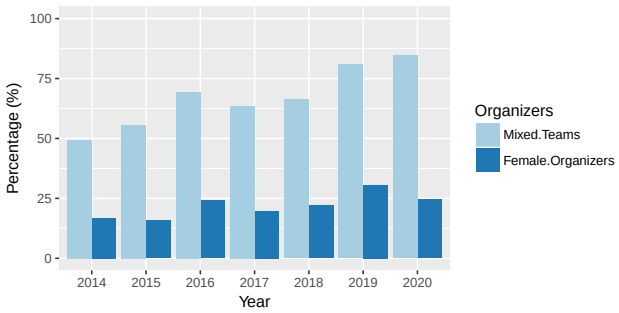


(b) Percentage of junior researchers, according to survey data.

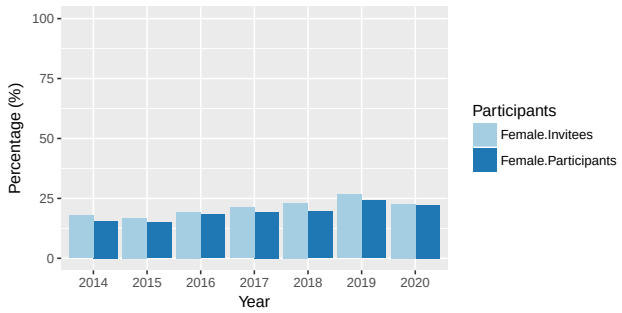


(c) Distribution of the origin of participants by region.

Fig. 2.4
Participants of Dagstuhl Seminars and Dagstuhl Perspectives Workshops in 2014–2020.



(a) Female organizers and mixed-gender organizer teams.



(b) Female invitees and participants.

Fig. 2.5
Female researchers at Dagstuhl Seminars and Dagstuhl Perspectives Workshops in 2014–2020.

Themen und Forschungsgebiete 2.6 *Topics and Research Areas*

Die thematischen Schwerpunkte der Dagstuhl-Seminare und Dagstuhl-Perspektiven-Workshops werden von den internationalen Antragstellern identifiziert und dem wissenschaftlichen Direktorium zur Durchführung vorgeschlagen. Hierdurch wird die internationale Forschungsgemeinde aktiv in die Programmgestaltung eingebunden – zugleich ist gewährleistet, dass aufgrund der Expertise der Antragsteller in ihren jeweiligen Forschungsgebieten immer brandaktuelle Themenschwerpunkte gesetzt werden.

Im Folgenden sind beispielhaft einige thematische Schwerpunkte und dazugehörige Seminare aufgeführt. Die Aufzählung der Themen und Seminare hat keinen Anspruch auf Vollständigkeit und ist lediglich ein Versuch, einen kurzen Einblick in das facettenreiche Seminar-Programm zu geben. Kapitel 6 bietet mit den Kurzzusam-

The topics of Dagstuhl Seminars and Dagstuhl Perspectives Workshops are identified by researchers from all over the world, who pass on this information to the Schloss Dagstuhl Scientific Directorate in their submitted proposals. The international research community is thus actively involved in shaping Dagstuhl's scientific seminar program, and their expertise ensures that the most important cutting edge topics are emphasized.

The following overview gives some topical focal points and a few respective seminars from 2020. Neither the list of focal points nor the list of seminars is exhaustive. It merely attempts to offer a brief insight into the multifarious scientific seminar program of 2020. Chapter 6, with the summary of the Seminars and Perspectives Workshops,

menfassungen der Seminare und Perspektiven-Workshops einen vollständigen Überblick über das wissenschaftliche Seminar-Programm des Jahres 2020.

Trotz des reduzierten Seminarporgramms deckten die Themen große Teile der Informatik ab. Von den theoretischen Grundlagen, etwa *Scheduling* (20081), über mehr angewandte Themen wie *Spoken Language Interaction with Virtual Agents and Robots (SLIVAR): Towards Effective and Ethical Interaction* (20021) bis zu praktisch relevanten Themen *Decision-Making Modeling and Solutions for Smart Semiconductor Manufacturing* (20452). war wieder alles vertreten. Das letztgenannte Seminar bestach durch eine außergewöhnlich hohe Industriebeteiligung

Leider sind 2020 viele spannende Themen der Pandemie zum Opfer gefallen, etwa *Quantum Complexity: Theory and Application*, *Cognitive Augmentation* oder *Rational Design of RiboNucleic Acids*. Wir sind uns aber zuversichtlich, dass diese in naher Zukunft unser Programm erneut bereichern werden.

Diese kleine Auswahl von Seminaren soll aber nicht darüber hinwegtäuschen, dass jedes der in 2020 veranstalteten Seminare wichtige Themen adressiert hat, die von den beteiligten Wissenschaftler mit großem Engagement diskutiert wurden und so die weitere Entwicklung in den einzelnen Gebieten wieder ein gutes Stück weitergebracht hat.

provides a full overview of the 2020 scientific seminar program.

Despite the reduced seminar program, the topics covered large parts of computer science. From the theoretical basics, such as *scheduling* (20081), to more applied topics like *Spoken Language Interaction with Virtual Agents and Robots (SLIVAR): Towards Effective and Ethical Interaction* (20021) to practically relevant topics *Decision-Making Modeling and Solutions for Smart Semiconductor Manufacturing* (20452) everything was represented again. The latter seminar attracted an exceptionally high level of industry participation.

Unfortunately, many exciting topics fell victim to the pandemic in 2020, for example, *Quantum Complexity: Theory and Application*, *Cognitive Augmentation*, or *Rational Design of RiboNucleic Acids*. However, we are confident that they will enrich our program again in the near future.

This brief selection of seminars should not draw attention from the fact that each of the 2020 seminars addressed important topics which were discussed by the involved researchers with great commitment and hence pushed forward the development in the individual areas.

Weitere Veranstaltungstypen 2.7 *Further Event Types*

Neben den Dagstuhl-Seminaren und Dagstuhl-Perspektiven-Workshops finden noch weitere Veranstaltungen im Zentrum statt. Zu diesen Veranstaltungen gehören:

- GI-Dagstuhl-Seminare, die den wissenschaftlichen Nachwuchs zu einem bestimmten Thema zusammenführen. Sie werden in Kooperation mit der GI durchgeführt und von dieser sowie von Dagstuhl gefördert. Anträge auf GI-Dagstuhl Seminare werden vom Vorstand der GIBU (GI Beirat der Universitätsprofessoren) und vom Wissenschaftlichen Direktor von Schloss Dagstuhl begutachtet.
- Weiterbildungsveranstaltungen wie Sommerschulen und Lehrerfortbildungen.
- Forschungsgruppentreffen wie Klausurtagungen von Graduiertenkollegs, GI-Fachgruppen und anderen akademischen Arbeitsgruppen.
- Forschungsaufenthalte von Einzelpersonen, die sich für eine oder mehrere Wochen für intensive Studien nach Dagstuhl in Klausur zurückziehen.

In addition to Dagstuhl Seminars and Dagstuhl Perspectives Workshops, Schloss Dagstuhl hosts a number of further events, including:

- GI-Dagstuhl Seminars bring young scholars together to discuss and learn about a specific topic. They are run and sponsored by the German Informatics Society (GI) in association with Schloss Dagstuhl. Proposals for GI-Dagstuhl Seminars are reviewed by the managing board of the GIBU (GI advisory board of computer science professors) and the Scientific Director of Schloss Dagstuhl.
- continuing education courses including summer schools and vocational training for teachers.
- research group meetings including conferences of graduate research training groups, GI specialist groups, and other academic working groups.
- research stays of scientists who wish to use the center as a retreat for several weeks in order to devote themselves to their studies undisturbed.

Qualitätssicherung 2.8 *Quality Assurance*

Schloss Dagstuhl befragt die Teilnehmer der Dagstuhl-Seminare und der Dagstuhl-Perspektiven-Workshops mit Hilfe eines Fragebogens zu ihrer Zufriedenheit mit inhaltlichen und organisatorischen Aspekten ihres Dag-

The center conducts surveys of the participants of the Dagstuhl Seminars and Dagstuhl Perspectives Workshops, the questionnaire containing questions about their satisfaction with the content of the event and the organization of

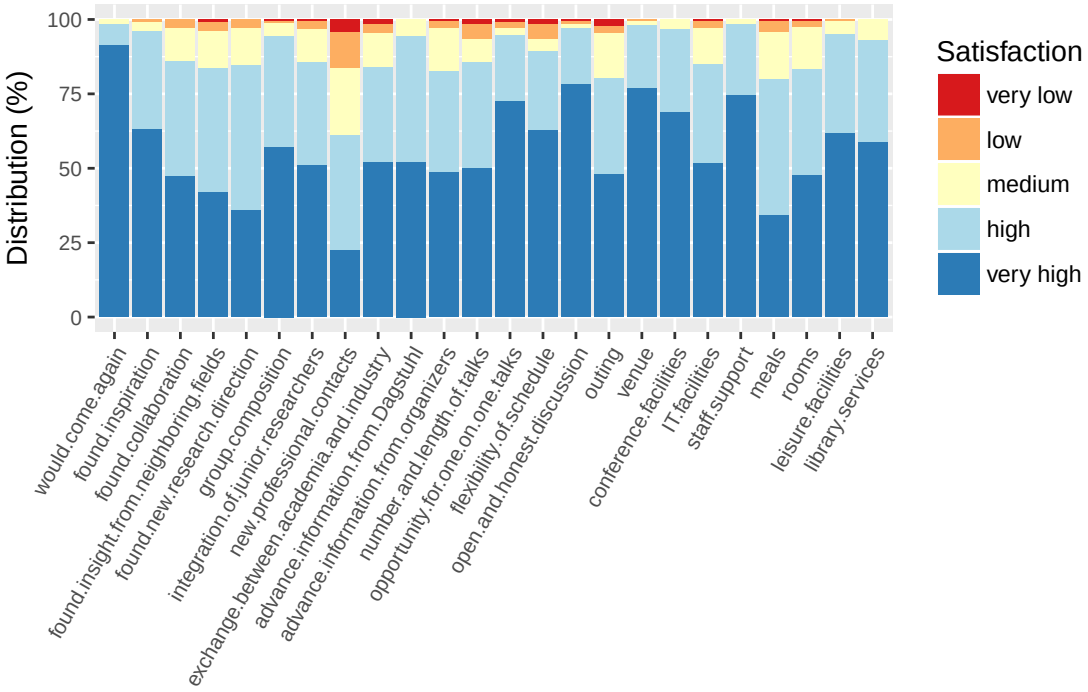


Fig. 2.6
Satisfaction of Dagstuhl Seminar and Dagstuhl Perspectives Workshop participants in 2020. According to survey results.

stuhlbesuchs. Die Ergebnisse jedes Fragebogens werden im Haus wöchentlich allen Abteilungen zugänglich gemacht, um eine schnelle Reaktion auf Probleme und Wünsche zu erreichen. Gleichzeitig werden anonymisierte Ergebnisse von inhaltlichen Fragen den Teilnehmern eines Seminars per E-Mail mitgeteilt, typischerweise in der Woche nach ihrem Aufenthalt. So erhalten insbesondere Organisatoren Rückmeldungen über den Verlauf des Seminars und Hinweise für die Organisation von zukünftigen Seminaren. In den zur Verfügung gestellten PDF-Dokumente werden die statistischen Ergebnisse mit Hilfe von aussagekräftigen Diagrammen aufbereitet.

Fig. 2.6 zeigt die Zufriedenheit dieser Teilnehmer im Jahr 2020 zu ausgewählten Aspekten ihres Aufenthaltes. Grundlage ist die Auswertung von 218 Fragebögen, welche die Meinung von etwa 52 % der 418 Teilnehmer repräsentieren. Das durchweg sehr gute Ergebnis ist Anerkennung und Herausforderung zugleich.

Als Teil des Einladungsprozesses der Dagstuhl-Seminare und der Dagstuhl-Perspektiven-Workshops wird die Liste der von den Organisatoren zur Einladung Vorgeschlagenen von Schloss Dagstuhl auf eine ausgewogene Zusammensetzung geprüft, bevor Schloss Dagstuhl Einladungen ausspricht. Mittels einer täglich aktualisierten Webseite bietet Schloss Dagstuhl allen Organisatoren einen direkten Einblick in den Status der eingeladenen Gäste bezüglich Zu- oder Absage.

their visit. The results of each questionnaire are made available to all of the center's departments every week, thus enabling a quick response to issues and requests. At the same time, anonymized results of the content questions are made available to the seminar participants via e-mail, typically in the week following their stay at the center. This enables the organizers to receive feedback on how the seminar went and tips for organizing future seminars. In the pdf files with the results, the statistics are visualized using illuminative diagrams.

Fig. 2.6 shows the satisfaction of responding participants in 2020 with regard to selected aspects of their stay. The results were compiled from 218 questionnaires, representing the responses of about 52 % of all 418 participants. These excellent results are not only a recognition of the center's past work but also pose a challenge to its future work.

During the invitation process for Dagstuhl Seminars and Dagstuhl Perspectives Workshops, the Organizers compile a list of proposed invitees which is reviewed by Schloss Dagstuhl to check it for a balanced composition before Schloss Dagstuhl extends invitations. Via a dedicated webpage that is updated daily, Schloss Dagstuhl gives the organizers direct access to view the status of invitee replies.

Auslastung des Zentrums 2.9 *Utilization of the Center*

2020 war die Auslastung aufgrund der SARS-CoV-2 Pandemie geringer als in den Vorjahren. Es gab 2020 ins-

Due to the SARS-CoV-2 Pandemic, the capacity utilization in 2020 was lower than in the previous years. There

gesamt 2 598 Gasttage, wobei 1 984 Gasttage auf Dagstuhl-Seminare und Dagstuhl-Perspektiven-Workshops entfielen. Es fanden im Berichtsjahr 37 Veranstaltungen mit insgesamt 656 Gästen statt. Weitere Details können Kapitel 13 entnommen werden.

Die Wochenenden blieben 2020 ebenso unbelegt eine Woche zum Jahresanfang, eine Woche zum Jahresende, welche zu Instandhaltungs- und Verwaltungsarbeiten benötigt wurden, sowie wegen der Pandemie die Zeit zwischen dem 15. März und dem 15. August. Weitere 5 Wochen blieben aufgrund von Veranstaltungsabsagen unbelegt. Erfreulicherweise konnte Schloss Dagstuhl aufgrund seines Hygienekonzepts im Juli einem Forscher ermöglichen, in Schloss Dagstuhl ungestört seiner Arbeit nachzugehen, während vieles andere noch geschlossen war.

Ein umfassendes Verzeichnis aller Veranstaltungen auf Schloss Dagstuhl im Jahr 2020 einschließlich Dagstuhl-Seminaren, Dagstuhl-Perspektiven-Workshops, GI-Dagstuhl-Seminaren und Veranstaltungen (z.B. Sommerschulen), bei denen Schloss Dagstuhl nur Veranstaltungsort war, findet sich in Kapitel 14. Auf unserer Webseite ist ein Kalender[5] verfügbar, in welchem die anstehenden Veranstaltungen eingesehen werden können, ebenso wie weitere Informationen und Materialien zu allen vergangenen, aktuellen und zukünftigen Veranstaltungen.

were 2,598 overnight stays in total, with 1,984 overnight stays in Dagstuhl Seminars and Dagstuhl Perspectives Workshops. The center hosted a total of 37 events with 656 guests in 2020. See Chapter 13 for further details.

Weekends were kept free in 2020, as well as a week at the beginning of the year and a week at the end of the year, this time being required for maintenance work to building facilities and administrative work. Between March 15 and August 15, the center was closed due to the pandemic. A further 5 weeks were free due to cancelations of events. Fortunately, its hygiene concept enabled Schloss Dagstuhl to allow a researcher to pursue his work undisturbed at Schloss Dagstuhl in July, while many other places were still closed.

A comprehensive listing of all events at Schloss Dagstuhl in 2020, including Dagstuhl Seminars, Dagstuhl Perspectives Workshops, GI-Dagstuhl Seminars, and host-only events such as meetings and summer schools can be found in Chapter 14. See the Schloss Dagstuhl website to view our calendar[5] of upcoming events and further information and materials on all events past, present and future.

[5] https://www.dagstuhl.de/no_cache/programm/kalender/

3 Bibliographiedatenbank dblp
dblp computer science bibliography

3.1 Offene Bibliographiedaten für die Informatik

Moderne Informatik-Forschung benötigt den unmittelbaren und umfassenden Zugriff auf aktuelle Publikationen, um den Bedürfnissen in einer sich immer schneller entwickelnden und immer komplexer werdenden Forschungslandschaft gerecht zu werden. Doch nicht nur im Forscheralltag, auch bei der Einschätzung von Forschungsleistung ist die Verfügbarkeit verlässlicher Publikationsdaten unverzichtbar. Hoch qualitative und vollständige Metadaten sind in der Regel jedoch nur sehr schwer zu erhalten. Freie Suchmaschinen wie etwa Google erlauben einen weiten Einblick in das Internet, besitzen aber keinerlei Qualitätsgarantien oder semantische Organisation. Kommerzielle Datenbanken verkaufen Metadaten als teure Dienstleistung, weisen aber in vielen Fachdisziplinen (wie etwa in der Informatik) nur eine mangelhafte Abdeckung und eine oft ungenügende Datenqualität auf. Insbesondere die einzigartige Publikationskultur der Informatik mit ihrem Schwerpunkt auf Konferenzpublikationen bleibt dabei unberücksichtigt, da für kommerzielle Anbieter hier die Breite des Marktes zu fehlen scheint. Universitäten und außeruniversitäre Forschungseinrichtungen bemühen sich oftmals mit immensem personellen und finanziellen Aufwand und unter Belastung der einzelnen forschenden Akteure, eigene Daten zu erheben. Diese Datensätze weisen jedoch zwangsläufig einen lokalen Einschlag auf und vermögen es nicht, ein detailliertes Bild einer Forschungsdisziplin als Ganzes zu zeichnen.

Die „dblp computer science bibliography“ leistet auf diesem Gebiet nun bereits seit über 25 Jahren einen substanziellen Beitrag durch die offene Bereitstellung qualitätsgeprüfter und aufbereiteter Publikationsdaten für die gesamte Informatik. Dabei unterstützt dblp die Informatik-Forschung auf gleich mehreren Ebenen, etwa durch:

- Unterstützung der täglichen Forschungsarbeit, etwa bei der Literaturrecherche und dem Bezug von verfügbaren Volltexten
- Unterstützung des wissenschaftlichen Publikationsprozesses durch die Bereitstellung normierter bibliographischer Referenzdaten
- Unterstützung von Forschern und Institutionen bei der Berichtspflicht durch die Sammlung und Aufbereitung von qualitätsgesicherten Publikationslisten
- Unterstützung von Forschungsförderern und Entscheidungsträgern durch das öffentliche Verfügbarmachen von nach Daten-Facetten aufgeschlüsselten Publikationsnachweisen

Darüber hinaus ist der dblp-Datensatz selbst Untersuchungsgegenstand mehrerer tausend Fachartikel.[6] Insgesamt ist dblp daher für die Informatik sowohl als Recherche-Tool, aber auch als Forschungsdatensatz unverzichtbar geworden.

3.1 *Open Bibliographic Data in Computer Science*

Modern computer science research requires immediate and comprehensive access to current publications to meet the needs of an ever faster evolving and ever more complex research landscape. Not only in the everyday work of a researcher but also in the assessment of research performance, the availability of reliable bibliographic metadata has become indispensable. However, high-quality and complete metadata is very difficult to obtain. Free search engines like Google allow a broad insight into the Internet but have neither guarantees of quality nor any semantic organization. Commercial databases sell metadata as an expensive service, but in many disciplines (such as in computer science) their coverage is insufficient and the data quality is quite poor. In particular, the unique publication culture of computer science with its emphasis on conference publications remains disregarded, as for commercial providers the width of the market seems to be missing here. Most universities and non-university research institutions endeavor to collect their own data, yet often consume enormous human and financial resources and impose a burden on the individual researchers. However, these local data sets do inevitably have a local bias and are not suited to draw a detailed picture of a research discipline as a whole.

For over 25 years now, the “dblp computer science bibliography” has substantially contributed to solving this dilemma in the field of computer science by providing open, quality-checked, and curated bibliographic metadata. The dblp web service supports the computer science research community on several levels, for example by:

- supporting researchers in their daily work, e.g., when reviewing the literature or searching for full-text research articles
- supporting the scientific publication process by providing standardized bibliographic reference data
- supporting researchers and institutions in their reporting duties by collecting and editing quality-assured bibliographies
- supporting research funders and decision-makers, e.g., by providing publicly available and explorable bibliographic references

In addition, the dblp data set itself is object of study of several thousand research articles.[7] Hence, dblp has become indispensable to the computer science community as both a research tool and a research data set.

[6] Google Scholar liefert zum Suchbegriff „dblp“ über 43 700 Treffer, Semantic Scholar liefert 1 330; im Einzelnen weisen SpringerLink ca. 4 350 Artikel, Elsevier ScienceDirect über 1 000 Artikel, die ACM Digital Library ca. 4 380 Artikel und IEEE Xplore über 2 800 Artikel nach.

[7] The search term “dblp” results in 43,700 hits at Google Scholar and 1,330 hits at Semantic Scholar; in particular, SpringerLink lists about 4,350 articles, Elsevier ScienceDirect lists more than 1,000 articles, the ACM Digital Library lists 4,380 articles, and IEEE Xplore lists more than 2,800 articles.

Schloss Dagstuhl und dblp

3.2 *Schloss Dagstuhl and dblp*

Bereits seit Ende 2010 engagiert sich Schloss Dagstuhl für die ursprünglich an der Universität Trier entwickelte Bibliographiedatenbank dblp. Zunächst durch ein Projekt im Leibniz-Wettbewerb gefördert, wurde die Datenbank seit Juni 2013 von Schloss Dagstuhl direkt mitfinanziert. Im Zuge der Konsolidierung der Zusammenarbeit mit der Universität Trier wurden unter dem Dach von Schloss Dagstuhl Mitarbeiterstellen im wissenschaftlichen Stab geschaffen, die hauptamtlich für die Betreuung und Weiterentwicklung von dblp beauftragt sind. Ein eigens gegründeter dblp-Beirat (siehe Fig. 3.1) leistet seit 2011 die wissenschaftliche Aufsicht und unterstützt das dblp-Team mit seiner Expertise.

Pünktlich zum 25-jährigen Jubiläum von dblp erfolgte im November 2018 die endgültige Staffelübergabe des Betriebes der Datenbank von der Universität Trier an Schloss Dagstuhl. Damit einhergehend wurden weitere Mittel für den Betrieb von dblp bereit gestellt und eine eigens neu eingerichtete Außenstelle von Schloss Dagstuhl auf dem Campus II der Universität Trier angesiedelt. Der Betrieb und die Erforschung der Datenbank erfolgen dabei weiterhin in enger Kooperation mit dem Fach Informatikwissenschaften der Universität sowie dem Trierer Center for Informatics Research and Technology (CIRT).[8]

Das dblp-Team besteht mitlerweile aus 8 Vollzeitäquivalenten, welche an der redaktionellen, technischen und wissenschaftlichen Verbesserung der Infrastruktur arbeiten. Das Team konnte 2020 mehr als 500 000 neue Publikationen indizieren (siehe Abschnitt 3.4). Gleichzeitig konnten eine große Anzahl an Fehlern im Bestand korrigiert werden (siehe Abschnitt 3.5). Parallel hierzu wird kontinuierlich an neuen Funktionen gearbeitet.

The cooperation between Schloss Dagstuhl and the dblp computer science bibliography – originally developed at the University of Trier – has been existing since late 2010. The commitment of Schloss Dagstuhl to dblp, initially funded by a project of the Leibniz Competition, is beeing funded directly by Schloss Dagstuhl since June 2013. As part of the consolidation of this cooperation, scientific staff positions – assigned fulltime to the support and development of dblp – were created. The dblp advisory board (cf. Figure 3.1), established in 2011 at Schloss Dagstuhl, provides scientific supervision and supports dblp with its expertise.

In November 2018, the transfer of the database from the University of Trier to the Leibniz Center for Informatics at Schloss Dagstuhl took place just in time for dblp's 25th anniversary. At the same time, Dagstuhl's funding was increased to support the operation of dblp and a new Schloss Dagstuhl branch office for the dblp team was established on Campus II of the University of Trier. The database will continue to be operated and researched in close cooperation with the University's Department of Computer Science and the Trier Center for Informatics Research and Technology (CIRT).[8]

The dblp team – which had been a one-person project for more than a decade – now consists of 8 full-time equivalent staff members working on the editorial, technical, and scientific improvement of the infrastructure. In 2020, the team handled the indexing of more than 500,000 new publications (see Section 3.4) but also did extensive curation work on the existing data (see Section 3.5). Parallel to the ongoing work with the data, we continuously improve the service by implementing new features.

[8] https://cirt.uni-trier.de/

dblp-Beirat | dblp Advisory Board
Prof. Dr. Hannah Bast University of Freiburg, Germany | *Chair*
Prof. Dr. Guillaume Cabanac Paul Sabatier University, Toulouse, France
Dr. Martin Fenner DataCite - International Data Citation Initiative e.V., Hannover, Germany
Prof. Dr. Silvio Peroni University of Bologna, Italy
Lydia Pintscher Wikimedia Deutschland - Association for the Promotion of Free Knowledge e.V., Berlin, Germany
Prof. Dr. Ruzica Piskac Yale University, New Haven, CT, USA
Prof. Dr. Rüdiger Reischuk University of Lübeck, Germany
Prof. Dr.-Ing. Ralf Schenkel University of Trier, Germany
Prof. Raimund Seidel, Ph.D. Saarland University, Saarbrücken, Germany

Fig. 3.1
The dblp Advisory Board in 2020.

Rückblick 2020

3.3

2020 in Review

COVID-19

Seit Mitte März 2020 arbeitet das dblp-Team überwiegend aus dem Homeoffice. Die Umstellung erfolgte ohne große Schwierigkeiten und hat unser Jahresergebnis nicht negativ beeinflusst. Im Gegenteil, das Jahr 2020 war das produktivste in der Geschichte des Projekts. Die Anzahl an neu aufgenommenen Publikationen erhöhte sich auf 506 718, 10,4% mehr als 2019 (siehe Abschnitt 3.4). Gleichzeitig stieg die Anzahl der Korrekturen am Bestand im Vergleich zu 2019 um 8% (siehe Abschnitt 3.5). Auch die Nutzung von dblp erhöhte sich in den meisten Metriken erheblich (siehe Abschnitt 3.6). Da zahlreiche Seminare aufgrund der Pandemie verschoben wurden, standen uns Kolleginnen aus diesem Bereich als Unterstützung zur Verfügung. Drei Kolleginnen wurden in das Extrahieren von Publikationsdaten aus Webseiten und PDFs eingewiesen. Auf diese Weise konnten zahlreiche alte, aber wissenschaftlich bedeutende Konferenzbände in dblp aufgenommen werden. Darüber hinaus wurden mit Hilfe der Dagstuhl-Bibliothek weitere ältere Werke aufgenommen. Durch diese Unterstützung konnten wir Lücken in dblp, insbesondere aus den 1980ern und frühen 1990ern, schließen.

Wir beobachteten 2020 keinen Rückgang der Anzahl an neuen Publikationen. Zwar konnten viele Konferenzen nicht am Konferenzort tagen. Die meisten Veranstaltungen fanden jedoch virtuell statt. Auch für viele abgesagte Konferenzen waren Publikationen verfügbar, die in dblp aufgenommen werden konnten. Die Anzahl an Veröffentlichungen in Journalen und auf Preprint-Servern hat sich, entsprechend einem lang anhaltenden Trend, weiter erhöht.

Anerkennung durch und Zusammearbeit mit ACM

Im Mai 2020 wurde Michael Ley mit dem angesehenen ACM Distinguished Service Award ausgezeichnet. Die ACM (Association for Computing Machinery) ist die weltgrößte Informatik-Fachgesellschaft. Der Distinguished Service Award wird an Einzelpersonen verliehen, die sich um die Informatik verdient gemacht haben. Die ACM würdigt mit dem Preis die Gründung und langjährige Leitung von dblp durch Herrn Ley. Die ACM beschreibt dblp als *außerordentlich nützliche und einflussreiche Online-Bibliographie, die die Art und Weise, in der Informatikerinnen und Informatiker arbeiten, verändert hat*[9]

Im weiteren Verlauf des Jahres wurde Michael Ley zum Mitglied der *ACM Presidential Task Force on Digital Library Metadata, Metrics, and Reporting Data* ernannt. Ziel der Gruppe ist es, die ACM in der Weiterentwicklung und Verbesserung ihrer digitalen Bibliothek zu beraten. Wir hoffen, die ACM mit unseren Erfahrungen unterstützen zu können. Gleichzeitig versprechen wir uns eine Verbesserung einer unserer wichtigsten Datenquellen.

COVID-19

Since mid March 2020, the dblp team works mostly remotely. Due to the nature of our work, we were able to switch to home offices without major difficulties. The home office setup has not affected our performance. In fact, 2020 was our most productive year in the history of the project. The number of newly indexed publications increased to 506,718, which is 10.4% more than in 2019 (See Sec. 3.4). At the same time, the number of data corrections has increased by 8% compared to 2019 (See Sec. 3.5). Usage of dblp also increased significantly for most relevant metrics (See Sec. 3.6). As many seminars were postponed because of the pandemic, some of our colleagues from this section supported us in obtaining publication metadata. To this goal we trained three colleagues to extract publication metadata from PDF files and web sites. We used their work mostly to add old but scientifically important proceedings to dblp, that were not available in machine-readable form. With the help of the Dagstuhl library we also included older books and collections that have so far been missing in dblp. This helped us close gaps in the scientific record of the 1980s and the early 1990s.

We have observed no significant decrease in new publications in 2020. While most conferences could not be held on site, many were transformed into virtual events. Even for many canceled conferences, proceedings were available to add to dblp. Following long-term trends, the number of publications in journals and on preprint servers increased.

Recognition by and collaboration with ACM

In May 2020, Michael Ley, the founder and project lead of dblp, received the prestigious ACM Distinguished Service Award in recognition of his work in creating and curating dblp. ACM (Association for Computing Machinery) is the world's largest computing society. The Distinguished Service Award recognizes service of individuals to the computer science community. The ACM describes dblp as *an extraordinarily useful and influential online bibliographic resource that has changed the way computer scientists work*[9]

Later that year, Michael Ley was appointed to the *ACM Presidential Task Force on Digital Library Metadata, Metrics, and Reporting Data*. The goal of this group is to advice the ACM President on the future development and improvements of their own digital library. We hope to support ACM with our experiences and – at the same time – profit by improvements of one of our major data sources.

[9] https://awards.acm.org/award_winners/ley_2903227

Stabile Identifier für Personen

Die Hauptaufgabe von dblp ist das Erstellen korrekter Bibliographien für Informatikerinnen und Informatiker. In der Vergangenheit war der Verweis auf diese Bibliographien, z.B. als Weblink, problematisch. Die URL einer Bibliographie basierte auf dem Personennamen. Zum Beispiel wurde die Autorengruppe Nicolas Bourbaki als https://dblp.org/pers/b/Bourbaki:Nicolas referenziert. Diese URLs sind unpraktisch und nicht stabil, da eine kleine Änderung das Namens auch die URL verändert. Seit August setzen wir ein System ein, das auf PIDs basiert. Eine PID ist ein persistenter Identifier und erlaubt das zuverlässige Referenzieren einer Bibliographie. Nicolas Bourbaki kann nun als https://dblp.org/pid/00/9506 referenziert werden. Personen-PIDs sind seit einigen Jahren in dblp vorhanden. Vor der Umstellung waren sie jedoch aus technischen Gründen kaum sichtbar. Seit der Umstellung sind die PIDs sowohl auf unseren Webseiten, als auch über unsere API verfügbar. Um das zu erreichen waren erhebliche Umstellungen an unserem internen Datenmanagement und an der Datenbereitstellung notwendig.

Wir hoffen, durch die sichtbaren PIDs die Weiterverwendung unserer Daten zu verbessern, zum Beispiel als Teil von Linked-Open-Data-Anwendungen. Wir hoffen außerdem, dass unsere Nutzer in Zukunft die stabilen PIDs nutzen, wenn sie beispielsweise von anderen Projekten auf dblp verlinken. So gibt es bereits etwa 46 000 Wikidata Entities mit einer dblp-PID.

Stable identifiers for persons

The most central task of dblp is to create clean bibliographies for computer scientists. In the past, referencing these bibliographies – e.g., linking to them from a web page – was problematic. The URL of a bibliography was created from the person's name, e.g., the URL for author group Nicolas Bourbaki was https://dblp.org/pers/b/Bourbaki:Nicolas . This is impractical and also not stable, as even small name changes alter the URL. In August, we deployed a major update which replaced the name-based URLs with PIDs. A PID is a persistent identifier that allows easy and reliable referencing of bibliographies. Nicolas Bourbaki can now be referenced as https://dblp.org/pid/00/9506 . Person PIDs have been existent in dblp for several years. However, due to technical limitations, they were not prominently displayed or used. With the update, PIDs are now available from our web sites and via the API. This improvement required major modifications of our internal data processing and delivery systems.

With the prominent usage of PIDs, we hope to improve data reusing, e.g., as part of linked open data. We also hope that our users will start using the PIDs, e.g., when linking to us from other projects. For example, there are already more than 46,000.

Statistiken der Datenakquise 3.4 *Data Acquisition Statistics*

Die Bibliographiedatenbank dblp indexiert Publikationen anhand vollständiger Inhaltsverzeichnisse von Konferenzbänden oder Journalausgaben. Mit Hilfe einer eigens entwickelten Software zur Datenextraktion werden Metadaten von Verlagswebseiten ausgelesen und zur weiteren Bearbeitung vorbereitet. Die Metadaten werden anschließend vom dblp-Team redaktionell bearbeitet: Eventuelle Fehler werden korrigiert, mehrdeutige und ungenaue Angaben werden verbessert. Diese Datenpflege wird zwar von Hilfssoftware unterstützt, erfolgt aber vornehmlich händisch durch den jeweiligen Mitarbeiter.

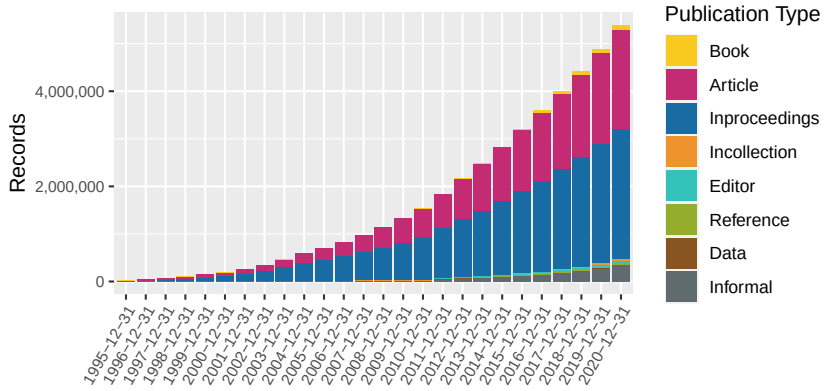
2020 wurden zum ersten Mal in der Geschichte von dblp in einem Jahr mehr als 500 000 neue Publikationen aufgenommen. Das entspricht etwa 2 000 neuen Publikationen pro Arbeitstag. Anfang 2020 wurde die Marke von fünf Millionen Publikationen überschritten. Am Ende des Jahres waren etwa 5,4 Millionen Publikationen aus den verschiedenen Teilgebieten der Informatik indexiert. Die neu aufgenommenen Einträge verteilen sich zu 42,9% auf Konferenzbeiträge, zu 39,5% auf Journalartikel, zu 14,6% auf Preprints und „graue" Literatur, sowie zu 3,0% auf andere Publikationstypen wie etwa Monographien und Dissertationen.

Ein Überblick über die Entwicklung der Datenakquise kann Fig. 3.2a und Fig. 3.2b entnommen werden.

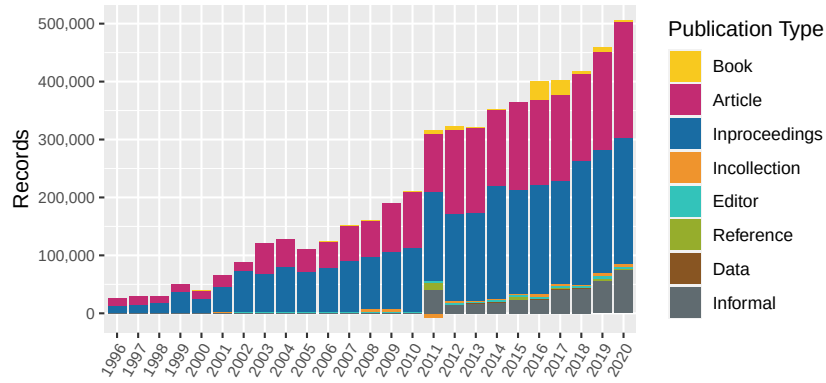
The dblp computer science bibliography indexes conferences and journals on a per-volume basis. Using dblp's own web harvesting software, bibliographic metadata of journal or proceedings volumes are extracted from the publisher's website. This metadata is diligently checked and corrected by the dblp team. The data-cleaning process is assisted by algorithms but executed almost exclusively by hand.

In 2020 – for the first time in its history – the dblp database grew by more than 500,000 publication records. This figure corresponds to about 2,000 new records for each working day of the year. In early 2020, we crossed the five million publication records mark. By the end of 2020, more than 5.4 million publications were indexed by dblp. This year's new records consist of 42.9% conference papers, 39.5% journal articles, 14.6% preprints and "grey" literature, and 3.0% further publication types like monographs and PhD theses.

The development of the dblp data set is summarized in Figure 3.2a and Figure 3.2b.



(a) Total number of records by year and type



(b) New records by year and type

Fig. 3.2
Development of the dblp data stock.

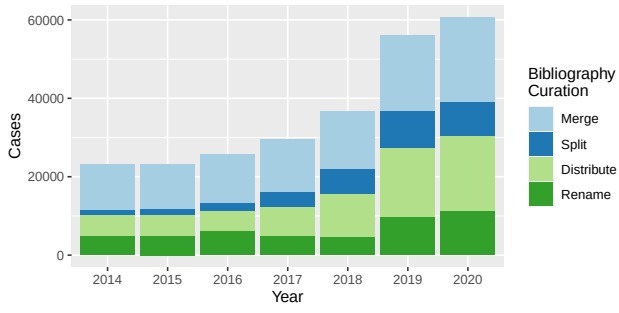


Fig. 3.3
Curation of existing dblp author bibliographies. The figures give the number of distinct edit cases (measured between the first and the last day of every given year) where a dblp team member manually corrected the assignment of publications within dblp author bibliographies. We distinguish between four curation cases: *Merge* = Two or more synonymous bibliographies have been merged into a single bibliography. *Split* = A single, homonymous bibliography has been split into two or more bibliographies. *Distribute* = A mixed case where records from two or more bibliographies have been redistributed between two or more bibliographies. *Rename* = A case where no actual publications have been reassigned, but the surface form of the author name(s) of a bibliography have been corrected or improved.

Statistiken der Datenkuration 3.5

Ein Hauptziel unserer intensiven Datenpflege ist es sicherzustellen, dass unsere Autorenbibliographien so korrekt und vollständig wie möglich sind. Das bedeutet, dass alle Publikationen eines Autors in nur einer einzigen Bibliographie aufgeführt sein sollen und dass diese Bibliographie auch nur Publikationen des spezifischen Autors listen soll. Es kann ziemlich schwierig sein, dies zu gewährleisten, und trotz unserer Bemühungen ordnen wir regelmäßig Publikationen einer falschen Bibliographie zu. Aus diesem Grund überprüft unser Redaktionsteam ständig unsere Daten und korrigiert solche Fehler.

Während spezielle Algorithmen dem Team helfen, solche Defekte aufzudecken, werden Korrekturen immer auf der Grundlage der Entscheidung eines menschlichen Kurators durchgeführt. Dies ist notwendig, da die verfügbaren Metadaten in der Regel nicht genügend Informationen enthalten, um eine hochpräzise automatisierte Lösung zu erlauben. Oft ist eine manuelle Recherche unter Berücksichtigung externer Ressourcen erforderlich.

2019 konnten wir, dank eines erheblich vergrößerten Teams die Anzahl an Korrekturen gegenüber dem Vorjahr um 52,3% steigern. 2020 gelang es uns – bei gleicher Teamgröße – die Zahl an Korrekturen um weitere 8,0% auf nunmehr 60 651 zu erhöhen. Fig. 3.3 zeigt die Anzahl der gelösten Fehlerfälle in den letzten Jahren. Hauptfaktoren für die erneute Steigerung sind verbesserte interne Werkzeuge zum Erkennen potentiell fehlerhafter Bibliographien und eine verbesserte Verfügbarkeit von ORCID Informationen. ORCIDs sind eindeutige Identifier, die Autoren mit ihren Papieren verbinden können. Der Vergleich von ORCID-Daten mit den von uns gepflegten Bibliographien hilft uns Zuordnungsfehler aufzudecken.

Data Curation Statistics

One main goal of the intensive data curation at dblp is to ensure that our author bibliographies are as correct and complete as possible. This means that all publications of a person should be listed in a single bibliography, and that a bibliography should only list publications from that specific author. It can be quite difficult to ensure this, and despite our best efforts, we regularly assign publications to the wrong bibliography. Because of this, our editorial team constantly checks our data and corrects such defects.

While specialized algorithms help our team to uncover and identify the nature of defects in our data, corrections are always executed based on the decision made by a human curator. This is necessary since the available metadata usually does not carry enough information to allow for a highly precise automated solution, and often requires a manual investigation taking external resources into account.

In 2019, the number of corrections increased by 52.3%, mostly as a result of an increased team size. In 2020 – with stable resources – we were able to further improve this number by about 8.0% to 60,651 cases. Figure 3.3 shows the number of resolved defect cases during the past few years. The primary factors for this increase are more efficient internal tools that point out potential errors to us and an increased availability of ORCID data. ORCID is a unique identifier that authors can attach to their publications. Comparing ORCID data with our bibliographies helps us to identify errors.

	Trier 1		Trier 2		Dagstuhl		Total		
	2019	2020	2019	2020	2019	2020	2019	2020	%
user sessions (visits) per day	31,024	31,450	1,808	414	24,994	36,849	57,827	68,715	+18.8
page views per day	735,190	712,228	22,761	40,523	326,053	486,166	1,084,005	1,238,918	+14.3
page views per user session	23.7	22.6	12.6	97.7	13.0	13.2	18.7	18.0	-3.8
distinct users (IPs) per month	466,015	473,014	12,963	4,433	424,106	578,492	903,085	1,055,941	+16.9
data served per month	2,114.1 GB	2,243.6 GB	89.6 GB	170.3 GB	821.3 GB	1,402.1 GB	3,025.0 GB	3,816.0 GB	+26.1

Fig. 3.4
Average usage of the three dblp web servers. Trier 1 = dblp.uni-trier.de, Trier 2 = dblp2.uni-trier.de, Dagstuhl = dblp.dagstuhl.de

Nutzungsstatistiken 3.6 *Usage Statistics*

Im Jahr 2020 wurden vom dblp-Team drei offizielle dblp-Server geführt. Die Daten dieser Server werden täglich aktualisiert und miteinander synchronisiert:

- Server Trier 1: dblp.uni-trier.de
- Server Trier 2: dblp2.uni-trier.de
- Server Dagstuhl: dblp.dagstuhl.de

Die allgemeine Adresse dblp.org ist dabei ein Alias für den dblp-Server in Dagstuhl.

Seit Mitte 2014 stehen vergleichbare Nutzerstatistiken von allen drei dblp-Servern zur Verfügung. Dabei war Server Trier 1 in der Vergangenheit aufgrund seiner prominenten Sichtbarkeit in den Google-Suchergebnissen die mit Abstand bekannteste Adresse. Im Laufe des Jahres 2018 konnte Server Dagstuhl jedoch zu Trier 1 aufschließen. Mittlerweile ist Server Dagstuhl der am meisten genutze Server bezüglich der Anzahl der Besucher sowie der Platzierung bei Google.

Insgesamt konnten die Nutzungszahlen in 2020 gegenüber dem Vorjahr deutlich gesteigert werden. Lediglich die Anzahl an Views per Session ist leicht rückläufig. Insbesondere werden die Server mitlerweile von mehr als einer Million verschiedenen Benutzern (identifiziert anhand ihrer IP-Adresse) pro Monat besucht. Fig. 3.4 fasst die durchschnittliche Nutzung aller drei dblp-Server zusammen. Diese Statistiken ignorieren die Zugriffe, die durch bekannte Bot- und Crawler-Software verursacht wurden.

In 2020, three official dblp web servers were updated and synchronized on a daily basis:

- server Trier 1: dblp.uni-trier.de
- server Trier 2: dblp2.uni-trier.de
- server Dagstuhl: dblp.dagstuhl.de

The main domain dblp.org is used as an alias for dblp server Dagstuhl.

Starting in mid-2014, usage data have been collected on all three mirror sites. In the past, Trier 1 had been the most widely known server due to its high visibility and prominence in the Google search engine. However, during the course of 2018, server Dagstuhl has become increasingly more visible. In 2020, server Dagstuhl overtook Trier 1 in respect to the number of visitors as well as the Google search ranking.

Overall, the total usage figures in 2020 significantly improved when compared to the previous year. Only the number of views per page slightly decreased. In particular, the dblp web servers are now visited by more than one million distinct users (identified by their IP address) per month. Figure 3.4 shows the average usage of all three servers. These figures ignore the traffic caused by known bots and crawlers.

4 Dagstuhl Publishing
Dagstuhl Publishing

Dagstuhl Publishing

Portfolio

4.1

Portfolio

Die Open-Access-Verlagsdienstleistungen von Schloss Dagstuhl werden in der Wissenschaftsgemeinde gut aufgenommen. Im Portfolio des Angebots gibt es zum einen Publikationsserien, die sich auf Veranstaltungen beziehen, die auf Schloss Dagstuhl abgehalten wurden (*Dagstuhl Reports*, *Dagstuhl Manifestos*, *Dagstuhl Follow-Ups*), zum anderen Serien, die Konferenzen und Workshops außerhalb von Schloss Dagstuhl bedienen (*LIPIcs* und *OASIcs*). Ergänzt wird das Portfolio um die wissenschaftliche Zeitschrift *LITES* und die Serie *DARTS*, in der Forschungsartefakte veröffentlicht werden.

Dagstuhl Reports

Alle Dagstuhl-Seminare und Dagstuhl-Perspektiven-Workshops werden in der Zeitschrift *Dagstuhl Reports*[10] dokumentiert, um eine Zitation der Seminare im wissenschaftlichen Kontext zu ermöglichen. Zudem bietet sie auch den Wissenschaftlern, die nicht am Seminar teilgenommen haben, einen zeitnahen Einblick in das, was beim Seminar diskutiert und erarbeitet wurde.

Die Zeitschrift erscheint seit 2011 und enthält in monatlichen Ausgaben Berichte zu den Dagstuhl-Seminaren und -Perspektiven-Workshops, die im jeweiligen Monat stattgefunden haben. Der Inhalt der Berichte wird nicht begutachtet. Das wissenschaftliche Direktorium (siehe Fig. 11.4) agiert als Herausgebergremium für die Reihe. Um umfassende Zusammenstellungen von begutachteten Artikeln auf Basis eines Dagstuhl-Seminars oder -Perspektiven-Workshops zu ermöglichen, wurde die Buchreihe *Dagstuhl Follow-Ups* (siehe unten) gegründet.

In 2020 wurde für 49 Dagstuhl-Seminare und -Perspektiven-Workshops ein Bericht in der Reihe *Dagstuhl Reports* veröffentlicht. An dieser Stelle bedanken wir uns ganz herzlich bei den Organisatoren und Kollektoren für die erfolgreiche Zusammenarbeit.

Dagstuhl Follow-Ups

Die Buchreihe *Dagstuhl Follow-Ups*[11] ermöglicht die Veröffentlichung einer Sammlung begutachteter Beiträge, die auf einem Dagstuhl-Seminar oder Dagstuhl-Perspektiven-Workshop basiert. Für jedes Buch ist ein Antrag notwendig, der vom wissenschaftlichen Direktorium (welches als Herausgebergremium verantwortlich ist) begutachtet und freigegeben werden muss. In 2020 wurde kein Buch in der Reihe veröffentlicht.

[10] https://www.dagstuhl.de/dagrep
[11] https://www.dagstuhl.de/dfu

The scientific community appreciates the Open Access publishing services offered by Schloss Dagstuhl. The portfolio covers series related to events at Schloss Dagstuhl (*Dagstuhl Reports*, *Dagstuhl Manifestos*, *Dagstuhl Follow-Ups*) and series for conferences and workshops held outside of Schloss Dagstuhl (*OASIcs* and *LIPIcs*). The portfolio is supplemented by the scholarly journal *LITES* and by the DARTS series which aims at publishing research artifacts.

Dagstuhl Reports

All Dagstuhl Seminars and Dagstuhl Perspectives Workshops are documented in the periodical *Dagstuhl Reports*[10] which enables the citation of the seminars in a scientific context. Furthermore, it allows scientists who were not able to attend the seminar to inform themselves about the work and discussions of the seminar in a timely manner.

The periodical started with the first seminars of January 2011 and publishes, in monthly issues, reports on Dagstuhl Seminars and Perspectives Workshops that took place in a given month. The content is not peer-reviewed. The Scientific Directorate (see Fig. 11.4) acts as editorial board. For comprehensive collections of peer-reviewed articles developed on the basis of a Dagstuhl Seminar or Perspectives Workshop, we offer seminar organizers the possibility of publishing a volume in our book series *Dagstuhl Follow-Ups* (see below).

In 2020, 49 reports of Dagstuhl Seminars and Dagstuhl Perspectives Workshops have been published. We would like to take this opportunity to cordially thank all organizers and collectors for their successful collaboration.

Dagstuhl Follow-Ups

The *Dagstuhl Follow-Ups*[11] book series is devoted to peer-reviewed collections of original research works that are rooted in a dedicated Dagstuhl Seminar or Dagstuhl Perspectives Workshop. Each book requires a proposal, which is reviewed and finally approved by the Scientific Directorate (which is in charge as editorial board). In 2020, no volume was published in the series.

Dagstuhl Publishing

Dagstuhl Manifestos

Seit 2011 werden in der Zeitschrift *Dagstuhl Manifestos*[12] die Manifestos der Dagstuhl-Perspektiven-Workshops – deren Erstellung zur Aufgabe des Dagstuhl-Perspektiven-Workshops gehört – Open Access veröffentlicht. Das wissenschaftliche Direktorium (siehe Fig. 11.4) fungiert hier ebenfalls als Herausgebergremium. In 2020 wurde kein Buch in der Reihe veröffentlicht

DARTS: Dagstuhl Artifacts Series

In der Reihe *DARTS*[13] werden qualitätsgesicherte Forschungsdaten und -artefakte veröffentlicht. Die Reihe hat dabei die Struktur einer Zeitschrift. In 2020 wurde die sechsten Ausgabe mit zwei Heften und insgesamt 24 Artefakten veröffentlicht.

Die Veröffentlichung und Bereitstellung von Forschungdaten und -artefakten ist aktuell ein wichtiges Thema in den wissenschaftlichen Disziplinen und bei den Forschungsfördereinrichtungen. Im Bereich der Informatik wird dieses Thema ebenfalls diskutiert. In 2015 gab es zum Beispiel einen Perspektiven-Workshop mit dem Titel „Artifact Evaluation for Publications“[14], der in 2016 durch zwei Seminare ergänzt wurde: „Reproducibility of Data-Oriented Experiments in e-Science“[15] und „Rethinking Experimental Methods in Computing“[16].

Schloss Dagstuhl unterstützt mit DARTS die Wissenschaftsgemeinde in der Informatik bei dem Wunsch, Forschungsdaten und -artefakte in einer geeigneten Reihe zu veröffentlichen. Hierbei berücksichtigt DARTS insbesondere auch die Publikationskultur in der Informatik mit ihrem Schwerpunkt auf Konferenzbandveröffentlichungen.

Dagstuhl Manifestos

Since 2011 we have published the manifestos – an expected result of Dagstuhl Perspectives Workshops – in the journal *Dagstuhl Manifestos*[12] in an Open Access manner. The Scientific Directorate (see Fig. 11.4) acts as the editorial board of the journal. In 2020, no volume was published in the series.

DARTS: Dagstuhl Artifacts Series

The *DARTS* series[13] publishes evaluated research data and artifacts. It is organized as a periodical. In 2020, the sixt volume containing two issues with 24 artifacts in total was published.

The publishing of research data and artifacts is currently in the general focus of the scientific community and funding agencies. In the area of computer science, this topic is also under discussion. For example, in 2015 a Perspectives Workshop on “Artifact Evaluation for Publications”[14] took place which was complemented with two seminars in 2016: “Reproducibility of Data-Oriented Experiments in e-Science”[15] and “Rethinking Experimental Methods in Computing”[16].

With DARTS, Schloss Dagstuhl is aiming to support the computing research community with a publishing venue dedicated to research data and artifacts. Especially, DARTS takes into account the publication culture in computer science which focuses on conference proceedings publications.

[12] https://www.dagstuhl.de/dagman
[13] https://www.dagstuhl.de/darts
[14] https://www.dagstuhl.de/15452
[15] https://www.dagstuhl.de/16041
[16] https://www.dagstuhl.de/16111

Dagstuhl Publishing

OASIcs: OpenAccess Series in Informatics

Die *OASIcs*-Reihe[17] veröffentlicht begutachtete Tagungsbände von Workshops, Symposien und Konferenzen. Das Herausgebergremium (Fig. 4.1), diskutiert sorgfältig alle Anträge, um ausschließlich qualitativ hochwertige sowie professionell durchgeführte Veranstaltungen in die Reihe aufzunehmen und um gegebenenfalls Empfehlungen zur Verbesserung der Veranstaltungsstruktur zu geben.

In 2020 wurden 11 Bände von thematisch breit gestreuten Workshops und Konferenzen veröffentlicht, siehe Fig. 4.2.

OASIcs: OpenAccess Series in Informatics

The *OASIcs* series[17] aims to publish the peer-reviewed proceedings of workshops, symposia, and conferences. The editorial board, see Fig. 4.1, discusses carefully all submitted proposals to ensure that only significant and professionally organized events are added to the series and that – if applicable – suggestions are given for improving the structure of the event.

In 2020, Dagstuhl published 11 *OASIcs* volumes covering the proceedings of topically widespread workshops and conferences; see Fig. 4.2.

[17] https://www.dagstuhl.de/oasics

Prof. Dr. Daniel Cremers TU Munich, Germany
Prof. Dr. Barbara Hammer Bielefeld University, Germany
Prof. Dr. Marc Langheinrich University of Lugano, Switzerland
Prof. Dr. Dorothea Wagner Karlsruhe Institute of Technology, Germany | Chair

Fig. 4.1
OASIcs Editorial Board.

Vol. 71 | International Conference on Blockchain Economics, Security and Protocols (Tokenomics 2019) https://www.dagstuhl.de/dagpub/978-3-95977-108-5
Vol. 76 | 10th Workshop on Evaluation and Usability of Programming Languages and Tools (PLATEAU 2019) https://www.dagstuhl.de/dagpub/978-3-95977-135-1
Vol. 77 | Workshop on Next Generation Real-Time Embedded Systems (NG-RES 2020) https://www.dagstuhl.de/dagpub/978-3-95977-136-8
Vol. 78 | Joint Post-proceedings of the First and Second International Conference on Microservices (Microservices 2017/2019) https://www.dagstuhl.de/dagpub/978-3-95977-137-5
Vol. 79 | 2nd International Workshop on Autonomous Systems Design (ASD 2020) https://www.dagstuhl.de/dagpub/978-3-95977-141-2
Vol. 80 | 2nd Workshop on Fog Computing and the IoT (Fog-IoT 2020) https://www.dagstuhl.de/dagpub/978-3-95977-144-3
Vol. 81 | First International Computer Programming Education Conference (ICPEC 2020) https://www.dagstuhl.de/dagpub/978-3-95977-153-5
Vol. 83 | 9th Symposium on Languages, Applications and Technologies (SLATE 2020) https://www.dagstuhl.de/dagpub/978-3-95977-165-8
Vol. 84 | 2nd Workshop on Formal Methods for Blockchains (FMBC 2020) https://www.dagstuhl.de/dagpub/978-3-95977-169-6
Vol. 85 | 20th Symposium on Algorithmic Approaches for Transportation Modelling, Optimization, and Systems (ATMOS 2020) https://www.dagstuhl.de/dagpub/978-3-95977-170-2
Vol. 86 | Recent Developments in the Design and Implementation of Programming Languages https://www.dagstuhl.de/dagpub/978-3-95977-171-9

Fig. 4.2
OASIcs volumes published in 2020.

Dagstuhl Publishing

LIPIcs: Leibniz International Proceedings in Informatics

Die *LIPIcs*-Reihe[18] veröffentlicht Tagungsbände von international renommierten Informatik-Konferenzen, die in ihrem jeweiligen Gebiet führend sind. Das internationale Herausgebergremium (siehe Fig. 4.3) besteht aus einschlägig bekannten Wissenschaftlern und wird seit Oktober 2017 von Luca Aceto als Hauptherausgeber geleitet.

In 2020 wurden Tagungsbände von 32 Konferenzen mit insgesamt 1351 Artikeln veröffentlicht; siehe Fig. 4.4 und 4.5.

Auch im zurückliegenden Jahr 2020 gab es wieder viele Anträge bei LIPIcs, womit die große Nachfrage aus den Vorjahren fortgesetzt wurde. In Fig. 4.6 sind alle Konferenzen aufgelistet, deren Anträge 2020 bei LIPIcs positiv begutachtet wurden und mit denen daher eine mehrjährige Kooperation (typischweise 5 Jahre) eingegangen wurde. Vier dieser Konferenzen haben erstmals einen Antrag bei LIPIcs gestellt. Die anderen Konferenzen haben bereits vorher mit LIPIcs kooperiert.

LIPIcs: Leibniz International Proceedings in Informatics

The *LIPIcs* series[18] publishes proceedings of leading conferences in the area of informatics. An international editorial board of renowned researchers (see Fig. 4.3) supervises the conferences that are accepted for LIPIcs and is headed since October 2017 by Luca Aceto.

The series published the proceedings of 32 major conferences with more than 1351 articles in total in 2020; see Fig. 4.4 and 4.5.

Harvesting the fruits of our long-lasting efforts to attract major conferences to LIPIcs, the year 2020 has again seen several applications for LIPIcs, continuing the high interest from the previous years. Fig. 4.6 lists all conferences that have been accepted in 2020 for a cooperation covering several years (typically 5 years). Four of these conferences have submitted a proposal to LIPIcs for the first time. The other conferences have already cooperated with LIPIcs in the past.

[18] https://www.dagstuhl.de/lipics

Prof. Dr. Luca Aceto Gran Sasso Science Institute, Italy and Reykjavik University, Iceland | Chair	Prof. Dieter van Melkebeek, Ph. D. University of Wisconsin-Madison, USA
Prof. Dr. Christel Baier Technische Universität Dresden, Germany	Prof. Dr. Anca Muscholl LaBRI and University Bordeaux, France
Prof. Dr. Mikolaj Bojanczyk University of Warsaw, Poland	Prof. Dr. Luke Ong University of Oxford, United Kingdom
Prof. Dr. Roberto Di Cosmo INRIA and University Paris Diderot, France	Dr. Catuscia Palamidessi INRIA, France
Prof. Dr. Javier Esparza Technical University Munich, Germany	Prof. Dr. Thomas Schwentick TU Dortmund, Germany
Prof. Dr. Meena Mahajan Institute of Mathematical Sciences, India	Prof. Raimund Seidel, Ph. D. Saarland University, Germany

Fig. 4.3
LIPIcs Editorial Board.

Dagstuhl Publishing

Vol. 151 | 11th Innovations in Theoretical Computer Science Conference (ITCS 2020)
https://www.dagstuhl.de/dagpub/978-3-95977-134-4

Vol. 152 | 28th EACSL Annual Conference on Computer Science Logic (CSL 2020)
https://www.dagstuhl.de/dagpub/978-3-95977-132-0

Vol. 153 | 23rd International Conference on Principles of Distributed Systems (OPODIS 2019)
https://www.dagstuhl.de/dagpub/978-3-95977-133-7

Vol. 154 | 37th International Symposium on Theoretical Aspects of Computer Science (STACS 2020)
https://www.dagstuhl.de/dagpub/978-3-95977-140-5

Vol. 155 | 23rd International Conference on Database Theory (ICDT 2020)
https://www.dagstuhl.de/dagpub/978-3-95977-139-9

Vol. 156 | 1st Symposium on Foundations of Responsible Computing (FORC 2020)
https://www.dagstuhl.de/dagpub/978-3-95977-142-9

Vol. 157 | 10th International Conference on Fun with Algorithms (FUN 2021)
https://www.dagstuhl.de/dagpub/978-3-95977-145-0

Vol. 158 | 15th Conference on the Theory of Quantum Computation, Communication and Cryptography (TQC 2020)
https://www.dagstuhl.de/dagpub/978-3-95977-146-7

Vol. 159 | 31st International Conference on Probabilistic, Combinatorial and Asymptotic Methods for the Analysis of Algorithms (AofA 2020)
https://www.dagstuhl.de/dagpub/978-3-95977-147-4

Vol. 160 | 18th International Symposium on Experimental Algorithms (SEA 2020)
https://www.dagstuhl.de/dagpub/978-3-95977-148-1

Vol. 161 | 31st Annual Symposium on Combinatorial Pattern Matching (CPM 2020)
https://www.dagstuhl.de/dagpub/978-3-95977-149-8

Vol. 162 | 17th Scandinavian Symposium and Workshops on Algorithm Theory (SWAT 2020)
https://www.dagstuhl.de/dagpub/978-3-95977-150-4

Vol. 163 | 1st Conference on Information-Theoretic Cryptography (ITC 2020)
https://www.dagstuhl.de/dagpub/978-3-95977-151-1

Vol. 164 | 36th International Symposium on Computational Geometry (SoCG 2020)
https://www.dagstuhl.de/dagpub/978-3-95977-143-6

Vol. 165 | 32nd Euromicro Conference on Real-Time Systems (ECRTS 2020)
https://www.dagstuhl.de/dagpub/978-3-95977-152-8

Vol. 166 | 34th European Conference on Object-Oriented Programming (ECOOP 2020)
https://www.dagstuhl.de/dagpub/978-3-95977-154-2

Vol. 167 | 5th International Conference on Formal Structures for Computation and Deduction (FSCD 2020)
https://www.dagstuhl.de/dagpub/978-3-95977-155-9

Vol. 168 | 47th International Colloquium on Automata, Languages, and Programming (ICALP 2020)
https://www.dagstuhl.de/dagpub/978-3-95977-138-2

Vol. 169 | 35th Computational Complexity Conference (CCC 2020)
https://www.dagstuhl.de/dagpub/978-3-95977-156-6

Fig. 4.4
LIPIcs volumes published in 2020 – Part 1.

Dagstuhl Publishing

Vol. 170 | 45th International Symposium on Mathematical Foundations of Computer Science (MFCS 2020) https://www.dagstuhl.de/dagpub/978-3-95977-159-7
Vol. 171 | 31st International Conference on Concurrency Theory (CONCUR 2020) https://www.dagstuhl.de/dagpub/978-3-95977-160-3
Vol. 172 | 20th International Workshop on Algorithms in Bioinformatics (WABI 2020) https://www.dagstuhl.de/dagpub/978-3-95977-161-0
Vol. 173 | 28th Annual European Symposium on Algorithms (ESA 2020) https://www.dagstuhl.de/dagpub/978-3-95977-162-7
Vol. 174 | 26th International Conference on DNA Computing and Molecular Programming (DNA 26) https://www.dagstuhl.de/dagpub/978-3-95977-163-4
Vol. 175 | 25th International Conference on Types for Proofs and Programs (TYPES 2019) https://www.dagstuhl.de/dagpub/978-3-95977-158-0
Vol. 176 | Approximation, Randomization, and Combinatorial Optimization. Algorithms and Techniques (APPROX/RANDOM 2020) https://www.dagstuhl.de/dagpub/978-3-95977-164-1
Vol. 177 | 11th International Conference on Geographic Information Science (GIScience 2021) - Part I https://www.dagstuhl.de/dagpub/978-3-95977-166-5
Vol. 178 | 27th International Symposium on Temporal Representation and Reasoning (TIME 2020) https://www.dagstuhl.de/dagpub/978-3-95977-167-2
Vol. 179 | 34th International Symposium on Distributed Computing (DISC 2020) https://www.dagstuhl.de/dagpub/978-3-95977-168-9
Vol. 180 | 15th International Symposium on Parameterized and Exact Computation (IPEC 2020) https://www.dagstuhl.de/dagpub/978-3-95977-172-6
Vol. 181 | 31st International Symposium on Algorithms and Computation (ISAAC 2020) https://www.dagstuhl.de/dagpub/978-3-95977-173-3
Vol. 182 | 40th IARCS Annual Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS 2020) https://www.dagstuhl.de/dagpub/978-3-95977-174-0

Fig. 4.5
LIPIcs volumes published in 2020 – Part 2.

CALCO | Conference on Algebra and Coalgebra in Computer Science accepted for 2021 (Re-evaluation)
CP | International Conference on Principles and Practice of Constraint Programming accepted for 2021–2025
CPM | Annual Symposium on Combinatorial Pattern Matching accepted for 2021–2023 (Re-evaluation)
CSL | Computer Science Logic accepted for 2021–2025 (Re-evaluation)
ICALP | International Colloquium on Automata, Languages, and Programming accepted for 2021–2025 (Re-evaluation)
IPEC | International Symposium on Parameterized and Exact Computation accepted for 2020–2024 (Re-evaluation)
ISAAC | International Symposium on Algorithms and Computation accepted for 2021–2025 (Re-evaluation)
OPODIS | International Conference on Principles of Distributed Systems accepted for 2020–2024 (Re-evaluation)
TYPES | International Conference on Types for Proofs and Programs accepted for 2020–2024 (Re-evaluation)

Fig. 4.6
Conferences accepted in 2020 for publication in LIPIcs.

Dagstuhl Publishing

LITES: Leibniz Transactions on Embedded Systems

Die Open Access-Fachzeitschrift *LITES*[19] veröffentlicht begutachtete Beiträge zu allen Aspekten eingebetteter Systeme. In 2012 wurde die Zeitschrift gegründet und in 2013 wurde der Betrieb aufgenommen. Ein breit aufgestelltes Team an erfahrenen Wissenschaftlern, die für ihr jeweiliges Fachgebiet verantwortlich zeichnen (siehe Fig. 4.7), begutachtet alle eingereichten Arbeiten. Die Zeitschrift wird gemeinsam mit der Fachgruppe *EMbedded Systems Special Interest Group (EMSIG)*[20] der Fachgesellschaft *European Design and Automation Association (EDAA)*[21] herausgegeben. Die Fachgruppe ist dabei für die Besetzung des Herausgebergremiums verantwortlich, während Schloss Dagstuhl die administrativen Aufgaben der Herausgeberschaft übernimmt.

Im Gegensatz zu anderen Zeitschriften im Bereich eingebetteter Systeme, steht bei *LITES* eine moderate Veröffentlichungsgebühr (article-processing charge, APC) sowie ein schnelles Begutachtungsverfahren (innerhalb eines Jahres ab Einreichung) im Vordergrund.

In 2020 wurde keine Ausgabe von *LITES* veröffentlicht, 17 Arbeiten befinden sich im Begutachtungsprozess.

LITES: Leibniz Transactions on Embedded Systems

The *LITES*[19] journal publishes original peer-reviewed articles on all aspects of embedded computer systems via Open Access. The journal was established in 2012 and started operating in early 2013. A broad team of experienced researchers, acting as editorial board (see Fig. 4.7), reviews all submitted contributions. The journal is jointly published with the *EMbedded Systems Special Interest Group (EMSIG)*[20] of the *European Design and Automation Association (EDAA)*[21]. The special interest group is responsible for appointing the editorial board, while Schloss Dagstuhl takes over the administrative tasks of the publication.

In contrast to existing journals on embedded computer systems, *LITES* charges only a moderate article-processing charge (APC) and aims at efficient reviewing procedures to ensure that articles are published within one year of submission.

In 2020, no issue of *LITES* was published, however, 17 papers are in the editorial pipeline.

[19] https://www.dagstuhl.de/lites
[20] http://www.emsig.net/
[21] https://www.edaa.com/

Prof. Alan Burns, DPhil University of York, UK | Editor-in-Chief	Prof. Bashir Al Hashimi University of Southampton, UK
Prof. Sang Lyul Min, Ph. D. Seoul National University, South Korea	Prof. Dr. Martin Fränzle Carl von Ossietzky University Oldenburg, Germany
Prof. Dr. Marco di Natale Scuola Superiore Santa Anna, Italy	Prof. Dr. Samarjit Chakraborty Technical University Munich, Germany
Dr. Virginie Wiels ONERA, France	Prof. Dr. Gernot Heiser University of New South Wales, Australia
Prof. Karl-Erik Arzen, Ph. D. Lund University, Sweden	Prof. Dr. Lothar Thiele ETH Zürich, Switzerland
Prof. Steve Goddard, Ph. D. University of Nebraska-Lincoln, US	Dr. Neil Audsley University of York, UK
Prof. Dr. Axel Jantsch Technical University of Vienna, Austria	Prof. Sanjoy Baruah, Ph. D. University of North Carolina at Chapel Hill, US

Fig. 4.7
LITES Editorial Board.

Dagstuhl Publishing

Infrastruktur 4.2 *Infrastructure*

Indizierung

Alle Reihen des Publikations-Portfolios werden bei *dblp* gelistet, siehe Fig. 4.8. Die Bände aus den Reihen *LIPIcs* und *OASIcs* werden zudem bei Scopus[22] eingereicht, wo sie regelmäßig indiziert werden. Die Reihen *LIPIcs* und *OASIcs* sowie die Zeitschrift *LITES* sind zudem im Directory of Open Access Journals (DOAJ) gelistet, siehe Fig. 4.8. Zudem unterstützen die technischen Schnittstellen die Datenakquise durch GoogleScholar, so dass die Publikationen sichtbar und besser recherchierbar sind.

LeibnizOpen

Die Leibniz-Gemeinschaft hat mit *LeibnizOpen*[23] ein Online-Repositorium ins Leben gerufen, um Open Access-Veröffentlichungen von Leibniz-Instituten und deren Wissenschaftlern zu unterstützen und sichtbar zu machen. Schloss Dagstuhl liefert alle Artikel aus den Reihen *Dagstuhl Reports* und *Dagstuhl Manifestos* an das Repositorium und stärkt dadurch Forschungsergebnisse aus der Informatik innerhalb dieses multidisziplininären Repositoriums.

Indexing

All series of the publication portfolio are listed in *dblp*; see Fig. 4.8. The LIPIcs and OASIcs volumes are submitted to Scopus[22] where they are regularly indexed. The *LIPIcs* and *OASIcs* series as well as the journal *LITES* are also listed in the Directory of Open Access Journals (DOAJ), see Fig. 4.8. The technical interface of our publication server enables harvesting according to the Google Scholar guidelines. Google Scholar regularly retrieves metadata and full-texts from our server.

LeibnizOpen

The Leibniz Association has established the *LeibnizOpen*[23] repository to promote the open-access publications of Leibniz institutes and their researchers. Schloss Dagstuhl submits all articles from the *Dagstuhl Reports* and *Dagstuhl Manifestos* series to the repository, thereby strengthening informatics-related research in this multi-disciplinary repository.

[22] https://www.scopus.com
[23] http://www.leibnizopen.de/

dblp
Dagstuhl Reports https://dblp.org/db/journals/dagstuhl-reports/
Dagstuhl Manifestos https://dblp.org/db/journals/dagstuhl-manifestos/
Dagstuhl Follow-Ups https://dblp.org/db/series/dfu/
OASIcs https://dblp.org/db/series/oasics/
LIPIcs https://dblp.org/db/series/lipics/
LITES https://dblp.org/db/journals/lites/
DARTS https://dblp.org/db/journals/darts/

DOAJ
OASIcs https://doaj.org/toc/2190-6807
LIPIcs https://doaj.org/toc/1868-8969
LITES https://doaj.org/toc/2199-2002

Fig. 4.8
Indexing of Dagstuhl Publishing series in dblp and DOAJ.

Dagstuhl Publishing

AK Open Access der Leibniz-Gemeinschaft

Schloss Dagstuhl engagiert sich im Arbeitskreis Open Access der Leibniz-Gemeinschaft. Im Rahmen dieses Engagements wurde ein Workshop „Erfolgreiches Journal-Management: Single Source Publishing“[24] mit organisiert, welcher bereits der sechste Workshop in Folge seit 2013 ist. Der Workshop findet am 14. April 2021 in virtuelle Form statt. Im Oktober 2020 wurde Dr. Michael Wagner, Mitglied des wissenschaftlichen Stabs von Schloss Dagstuhl, zum stellvertretenden Sprecher des Arbeitskreises gewählt.

Publikationsserver: DROPS

Über den Dagstuhl Research Online Publication Server (DROPS)[25] werden alle Veröffentlichungen von Schloss Dagstuhl verwaltet. Es werden hierbei die allgemeinen Richtlinien für Online-Publikationen gemäß der Dublin Core-Initiative[26] berücksichtigt, wodurch alle nötigen Metadaten zu jeder Publikation gespeichert werden und die Langzeitverfügbarkeit sichergestellt wird. Die Online-Publikationen sind zitierfähig und stehen einer großen Leserschaft zur Verfügung.

Einreichungssystem: DSub

Im Frühjahr 2019 wurde ein von Dagstuhl entwickeltes Einreichungssystem names DSub eingeführt. Mit diesem System werden seit dem alle Einreichungen zu den Reihen LIPIcs und OASIcs entgegengenommen. Unter anderem wurde mit dem neuen System dem Wunsch einer aktiven Autorenfreigabe der überarbeiteten Dokumente vor der Veröffentlichung entsprochen und die automatische Extraktion der Metadaten aus den LaTeX-Quellen ermöglicht.

Langzeitarchivierung

Alle Publikationen werden bei der Deutschen Nationalbibliothek (DNB)[27] zur (digitalen) Langzeitarchivierung eingereicht.

Mirroring

Um dem Verlust von Daten vorzubeugen, werden seit 2010 zwei Kooperationen zur Spiegelung (Mirroring) von Inhalten des Publiktionsservers DROPS gepflegt:

- emis.de: Das unter Leitung des FIZ Karlsruhe, Leibniz-Institut für Informationsinfrastruktur, organisierte Mathematik-Publikations-Portal European Mathematical Information Service (EMIS) spiegelt alle Bände der LIPIcs-Reihe.[28]
- SunSite Central Europe: Der Sun-Server-Park, der an der RWTH Aachen betrieben wird, bietet eine Heimat für zahlreiche Software-Archive und Publikationen. Der gesamte DROPS-Bestand wird in regelmäßigen Abständen auf der SunSite Aachen gespiegelt.[29]

Open Access Working Group of the Leibniz Association

A workshop entitled “Erfolgreiches Journal-Management: Single Source Publishing”[24] was initiated and coordinated as part of our membership in the Open Access working group of the Leibniz Association. The workshop will take place as a virtual event on April 14, 2021. In October 2020, Dr. Michael Wagner, a member of the scientific staff of Schloss Dagstuhl, was elected deputy spokesperson of the working group.

Publication server: DROPS

All items published by the center are administered via the Dagstuhl Research Online Publication Server (DROPS)[25]. The general guidelines of the Dublin Core initiative[26] applicable to online publications are adhered to, meaning that all the requisite metadata of each publication is stored, thus ensuring availability in the long term. This enables the online publications to be cited by and accessible to a wide readership.

Submission system: DSub

In spring 2019 a submission system called DSub developed by Dagstuhl was introduced. Since then, this system has been used to process all submissions for the LIPIcs and OASIcs series. Among other things, the new system has satisfied the need for active author approval of revised documents prior the publication and enables automatic extraction of metadata from LaTeX sources.

Long-term Archiving

All publications are submitted to the German National Library (DNB)[27] for (digital) long-term archiving.

Mirroring

In order to prevent data loss, two cooperative ventures were initiated in 2010 for mirroring the content of the DROPS publication server:

- emis.de: The portal for electronic math resources European Mathematical Information Service (EMIS), organized under the auspices of FIZ Karlsruhe – Leibniz Institute for Information Infrastructure, mirrors all volumes of the LIPIcs series[28].
- SunSite Central Europe: The Sun server park, located at the Aachen University of Technology, is home to numerous software archives and publications. All the DROPS assets are mirrored at regular intervals on the Aachen SunSite.[29]

[24] https://www.dagstuhl.de/fileadmin/dagpub/journalmanagement-leibniz/2021-04-workshop/
[25] https://www.dagstuhl.de/drops
[26] http://dublincore.org/
[27] https://www.dnb.de/DE/Professionell/Erhalten/erhalten_node.html#sprg209698
[28] https://subs.emis.de/LIPIcs/
[29] http://vesta.informatik.rwth-aachen.de/Dagstuhl/

5 Resonanz
Feedback

Resonanz zu Seminaren und Workshops

5.1

Feedback on Seminars and Workshops

Resonanz von Teilnehmern

Schloss Dagstuhl bekommt viel Lob von seinen Gästen, meistens in mündlicher Form, wenn die Gäste nach einer intensiven Seminarwoche das Schloss verlassen. Manche Gäste nehmen sich jedoch auch die Zeit, uns nachträglich zu schreiben und ihre Eindrücke mit uns zu teilen.

Feedback from Participants

Schloss Dagstuhl receives a lot of positive feedback, typically verbally when our guests are checking out after an intense seminar. However, many guests take the time to write to us about their impressions.

Friedrich Steimann (Fernuniversität in Hagen, DE)

20289 – Forschungsaufenthalt | Research stay | https://www.dagstuhl.de/20289

[…]the staff of Schloss Dagstuhl has hosted me and allowed me to complete my above-sketched work in their familiar, friendly, and perfectly organized environment.

Resonanz unserer Organisatoren

Der Erfolg von Schloss Dagstuhl hängt im wesentlichen Maße auch von den Seminarorganisatoren ab, die interessante und neue Themen vorschlagen. Wir sind hoch erfreut, dass die Seminarorganisatoren selber, die Angebote und die Umgebung, die wir zur Verfügung stellen, schätzen. Im Folgenden geben mit freundlicher Genehmigung der Autoren einige der Kommentare unsere Seminarorganisatoren wieder.

Feedback from Organizers

The success of Schloss Dagstuhl depends to a large extent on our outstanding seminar organizers, who continually enrich the scientific program with a range of interesting and new topics. We are very glad to be able to provide services and an environment that organizers appreciate. The following comments from organizers are excerpted from the Dagstuhl Report or personal emails to us. We cite them with their kindly permission.

The organizers of Dagstuhl Seminar 20031, Dagstuhl Report

20031 – Scalability in Multiobjective Optimization | Dagstuhl Seminar | https://www.dagstuhl.de/20031

This seminar resulted in a very insightful, productive and enjoyable week. It has already led to first new results and formed new cooperation, research teams and topics. The organizers would like to express their appreciation to the Dagstuhl office and its helpful and patient staff for their professional and smooth cooperation;[…]

Letter from the organizers of Dagstuhl Seminar 20372

20372 – Beyond Adaptation: Understanding Distributional Changes | Dagstuhl Seminar | https://www.dagstuhl.de/20372

[…]as organisers of the first Dagstuhl seminar after lockdown, we would like to express our gratitude for having had the opportunity to host our seminar despite challenging times, and for the great support that we received from Dagstuhl. All staff of Schloss Dagstuhl showed flexibility and did a great effort to support the needs of this seminar with on-site participants and remotely participating guests. We would like to thank everyone from the team in Dagstuhl.

Resonanz in Sozialen Netzwerken

Mehr und mehr Gäste nutzen die Möglichkeiten des Webs wie Twitter und Blogs über ihre Erfahrungen in Dagstuhl zu berichten. Wir geben hier einige Referenzen.

Feedback in Social Media

More and more of our guests are using social media such as Twitter and blogs to share their experiences of Dagstuhl with others. Below are some selected excerpts.

Carola Doerr (Sorbonne University – Paris, FR)
Twitter | https://twitter.com/CarolaDoerr19/status/1318494687313932288

+1 @dagstuhl seminars are definitively my #1 research events. High level of interaction and foreward-oriented discussions (vs conferences where we often end up listening to stuff that has already been done. Latter is important, but it's a feature of dag. to kickstart new ideas)

Carola Doerr (Sorbonne University – Paris, FR)
Twitter | https://twitter.com/CarolaDoerr19/status/1318508394400141312

Forgot to mention, but the fact the dagstuhl staff organizes child care has really helped us so much. Wouldn't have been able to attend some of the seminars otherwise. Great to see some institutions do care and families

Marcus Gallagher (The University of Queensland – Brisbane, AU)
Twitter | https://twitter.com/marcus_marcusg/status/1318504842172657670

+1 @dagstuhl is truly an amazing place! #1 on my list as well. Really hope I can go there again sometime soon. Totally worth the 20+ hours of flying, train and taxi journey from Australia.

Resonanz im Fragebogen

Jeder Teilnehmer erhält von uns einen Fragebogen zur Evaluation des vom Teilnehmer besuchten Dagstuhl-Seminars oder Dagstuhl-Perspektiven-Workshops. Durch diese anonymen Befragung erhalten wir ebenfalls eine Menge positiver Kommentare. Im Folgenden zitieren wir hier einige von diesen.

Survey Feedback

Every participant has the opportunity to fill out a questionnaire about the Dagstuhl Seminar or Dagstuhl Perspectives Workshop they attended for evaluation purposes. Below are some excerpts from the many positive comments we received through this anonymous survey.

20021 – Spoken Language Interaction with Virtual Agents and Robots (SLIVAR): Towards Effective and Ethical Interaction | Dagstuhl Seminar | https://www.dagstuhl.de/20021

A great venue for scientific workshops.

20031 – Scalability in Multiobjective Optimization | Dagstuhl Seminar | https://www.dagstuhl.de/20031

– Very intense, require hard work. + High impact in terms of research ideas.

20031 – Scalability in Multiobjective Optimization | Dagstuhl Seminar | https://www.dagstuhl.de/20031

There are no bad parts. Dagstuhl is a wonderful concept.

20031 – Scalability in Multiobjective Optimization | Dagstuhl Seminar | https://www.dagstuhl.de/20031

I think Schloss Dagstuhl is unique to Germany and is a great resource.

20031 – Scalability in Multiobjective Optimization | Dagstuhl Seminar | https://www.dagstuhl.de/20031

I think you are on the leading edge.

20041 – Symmetric Cryptography | Dagstuhl Seminar | https://www.dagstuhl.de/20041

++ Sehr gemütlich.

20041 – Symmetric Cryptography | Dagstuhl Seminar | https://www.dagstuhl.de/20041

The best: to exchange ideas with experienced researchers in a good atmosphere.

20041 – Symmetric Cryptography | Dagstuhl Seminar | https://www.dagstuhl.de/20041

+ Brings together community & boosts benefits from collaboration

20051 – Computational Metabolomics: From Cheminformatics to Machine Learning | Dagstuhl Seminar | https://www.dagstuhl.de/20051

Well taken care off :-)

20051 – Computational Metabolomics: From Cheminformatics to Machine Learning | Dagstuhl Seminar | https://www.dagstuhl.de/20051

Dagstuhl is an excellent facility and is run in an extremely efficient manner.

20051 – Computational Metabolomics: From Cheminformatics to Machine Learning | Dagstuhl Seminar | https://www.dagstuhl.de/20051

my meals were delicious - thank you very much for preparing vegetarian and milkfree dishes for me :)

20051 – Computational Metabolomics: From Cheminformatics to Machine Learning | Dagstuhl Seminar | https://www.dagstuhl.de/20051

I was impressed about the scholarly quality of Dagstuhl. In my field of research, such seminars with plenty of calmness, freedom and flexibility are rare.

20051 – Computational Metabolomics: From Cheminformatics to Machine Learning | Dagstuhl Seminar | https://www.dagstuhl.de/20051

I think you have built a truely unique place here, so just keep going. You are a model for others.

20071 – Foundations of Composite Event Recognition | Dagstuhl Seminar | https://www.dagstuhl.de/20071

Dagstuhl is a unique place and institution in Computer Science. It is always a pleasure to be here. The appreciation can be seen from the fact that it made it into the CS idom: "let's have a Dagstuhl on this..."

20071 – Foundations of Composite Event Recognition | Dagstuhl Seminar | https://www.dagstuhl.de/20071

This is my first time at Dagstuhl. I have heard a lot about it, so I am happy I got a chance to participate in it.

20071 – Foundations of Composite Event Recognition | Dagstuhl Seminar | https://www.dagstuhl.de/20071

The Dagstuhl staff members have all been wonderful.

20111 – Tensor Computations: Applications and Optimization | Dagstuhl Seminar | https://www.dagstuhl.de/20111

I brought my 2 year-old son to the seminar as my wife was also due to be travelling at the time. That I was able to do this was an outstanding service, without it I would not have been able to come. The provision for my son has been exceptional, from change facilities in the room, the attentiveness of the dining hall staff, and particularly the excellent services of Dagstuhl's nanny. Every staff member we have met has been exceptionally friendly to him, and we have been made to feel exceptionally welcome.

20382 – Interactive Visualization for Fostering Trust in AI | Dagstuhl Seminar | https://www.dagstuhl.de/20382

Staff was very welcoming, Cafeteria staff was super.

Resonanz zur Bibliographiedatenbank dblp

5.2

Feedback on the dblp Computer Science Bibliography

Die Bibliographiedatenbank dblp wird von zahlreichen internationalen Wissenschaftlern hoch geschätzt und erhält viel Lob. Feedback erhalten wir per Mail, durch Gespräche mit Forschern vor Ort in Dagstuhl, oder durch die sozialen Medien. Zudem wurde 2020 eigens eine Nutzerbefragung zu dblp durchgeführt.

The dblp computer science bibliography is internationally well known and appreciated. We receive a lot of feedback via mail, through discussions with researchers at Schloss Dagstuhl, and via social media. Further comments have been collected in a dedicated dblp user survey in 2020.

Resonanz Nutzerbefragung 2020

Feedback from the User Survey 2020

anonymous survey comment
dblp User Survey 2020 | https://dblp.org

I found DBLP as very rich source of research, at the same time being very well-curated, very reliable and precise. I trust DBLP on the same level as classical Scopus or Web of Science databases. I trust DBLP much than Google Scholar and Research Gate which I found to be rather non-curated and therefore not reliable.

anonymous survey comment
dblp User Survey 2020 | https://dblp.org

You are doing an outstanding job with DBLP. It is the single most important tool for bibliography curation in computer science. Thank you for all your effort!

anonymous survey comment
dblp User Survey 2020 | https://dblp.org

Thanks for your contribution to mankind. The DBLP team should be listed as a co-author of any paper I ever wrote!

anonymous survey comment
dblp User Survey 2020 | https://dblp.org

Thank you. There are sciences who have to manually copy references into their bibliography. Thanks to dblp I literally just copy-paste the DBLP results in my BibLaTeX document and I am done. Thanks to DBLP computer science is miles ahead of other fields (that do not have such a fancy platform)

anonymous survey comment
dblp User Survey 2020 | https://dblp.org

DBLP is really fantastic. Computer science is a very wild field, publication wise. DBLP, Google Scholar, and the CORE rankings help me to keep track of the huge amount of different publication venues we have.

anonymous survey comment
dblp User Survey 2020 | https://dblp.org

I think DBLP is a great tool, I've had much much good use of it. Given DBLP, I no longer maintain personal webpages with publications (basically, not after 2013), I standardly refer to DBLP to my collaborators or to other researchers looking for my works. DBLP saved me much work and much time, with many thanks.

anonymous survey comment
dblp User Survey 2020 | https://dblp.org

DBLP has saved me numerous hours of work! I advertise it to students writing theses. To my surprise some of my colleagues do not know it, so I advertise it to them, too. I highly appreciate that you provide such a valuable and well-functioning service free of charge!

anonymous survey comment
dblp User Survey 2020 | https://dblp.org

I would like to let you know that you are doing a great job. DBLP is only second to my search engine in the ranked list of the most fundamental tools of my day-to-day life.

anonymous survey comment
dblp User Survey 2020 | https://dblp.org

DBLP is very useful for me in my daily research life. It proves especially useful when evaluating people's work: I was part of a national computer science evaluation committee during 8 years, and all colleagues were using it extensively to check the truthfulness of what the candidates were reporting.

anonymous survey comment
dblp User Survey 2020 | https://dblp.org

I really appreciate that DBLP is focused on computer science bibliography, which eliminates lots of references that appear in other databases but are not really related to my research. This really optimizes time dedicated to filter references. I also like the classification of references by type of publication (journal, conference, etc.).

anonymous survey comment
dblp User Survey 2020 | https://dblp.org

I LOVE DBLP, as much as a person can "love" structured information. But honestly, I had some VERY great experiences in the past. A while ago I crawled some data from DBLP when the server responded with a proper HTTP 429 code indicating that I was performing too many requests. The FAQ casually mentioned that there is a full XML dump available, which made my work much easier. I really enjoy such attention to detail. And I LOVE the search engine. [...] The results are fast, responsive and relevant. I don't usually remember other websites' search "experience", but in this case: really great work!

anonymous survey comment
dblp User Survey 2020 | https://dblp.org

Thank you for being selective in what you index. Google Scholar and many other research indexes/sites are full of fake conferences and similar garbage. For the most part, if the conference or journal I'm considering doesn't get indexed by DBLP then I reconsider and submit elsewhere

anonymous survey comment
dblp User Survey 2020 | https://dblp.org

Overall I'm very satisfied with dblp. I appreciate that you do *not* index every meeting on this planet that involves computers. dblp should be the gate keeper to put junk conferences and journals where they belong. This is not easy (and probably also risky) - I am sure you know about Beall's list. So a list that is curated by an individual or a small group may be difficult but I would hope you can find a way to prevent the junk conferences from taking over (and the fact that Springer publishes a fair number of these does not help). I have seen a number of CVs (of faculty candidates) that contains 100 entries – but when I went to dblp to check how this candidate's real publication list looked like, and when I then saw that there were maybe only a handful (and I did not even know most of these conferences or venues) then this information helped us tremendously to sort the pile of faculty candidates.

anonymous survey comment
dblp User Survey 2020 | https://dblp.org

as someone who has been using DBLP for the last 20 years, I have say thank you as warmly as possible, for all the support throughout these years. DBLP is simply a tremendous service to mankind, as a clean, structured index of the bibliography of computer science

Resonanz in Sozialen Netzwerken

Social Media Feedback

Elsevier Pure, Amsterdam, The Netherlands

Twitter | https://twitter.com/elsevierpure/status/1282639677409890306

We are always on the look-out for new and valuable import sources to add to Pure! Did you check out our latest addition, @dblp_org, that includes more than 5 million #computerscience publications?

Mirela Riveni, TU Vienna, Austria

Twitter | https://twitter.com/mirusx/status/1229735699051696130

A tweet of gratitude to @dblp_org for their valuable work. Had seen the latest additions and the nice feature of open access indicators, but I just noticed that my ORCID is validated on it. Kudos for the speed and thanks!

Toby Walsh, University of New South Wales, NSW, Australia

Twitter | https://twitter.com/TobyWalsh/status/1243185294481879043

Thank you DBLP. You are the reason I haven't typed up a bibtex entry for many years. We appreciate you. Who do I write to so you never stop?

Philipp Leitner, Chalmers University of Technology, Sweden

Twitter | https://twitter.com/xLeitix/status/1261303698313097217

I'm max two years ago from writing "see DBLP" everywhere, because in practice this is the ground truth that I currently use to consolidate everything.

Julian Togelius, New York University, NY, USA

Twitter | https://twitter.com/togelius/status/1273095663560134659

arXiv + Google Scholar are the only platforms I do any active maintenance of. Everything else is either automatic or dysfunctional. Kudos to DBLP, for mostly getting things right without requiring any input from authors.

Jana Dunfield, Queen's University, ON, Canada

Twitter | https://twitter.com/etrolleybus/status/1337618881846910980

Yesterday, I emailed @dblp_org asking to correct my name. I figured, they're busy, it might take some time. It's already done.

Quite a contrast to ACM's "we'll eventually reply, to tell you which hoops we'll make you jump through before we'll even think about doing anything."

Amin Milani Fard, New York Institute of Technology, NY, USA

Twitter | https://twitter.com/milanifard/status/1339308448865894400

I have been using DBLP for the past 15 years, especially when I was an undergrad researcher and Google Scholar was not well-known. It is a very influential tool and changed the way computer scientists work. If you have ever used DBLP, please help to make it even better.

Antonio Vergari, University of California, Los Angeles, CA, USA

Twitter | https://twitter.com/tetraduzione/status/1339691185477042176

how is it possible that the quality of BibTex references from #Google #Scholar is generally crap while those from @dblp_org range from good to great? Why (at least for CS) isn't Google importing the higher quality ones from #DBLP?

ACM Distinguisched Service Award

ACM Distinguisched Service Award

Association for Computing Machinery, New York City, NY, USA

2019 ACM Distinguished Service Award laudation | https://awards.acm.org/award_winners/ley_2903227

Michael Ley was named recipient of the ACM Distinguished Service Award for creating, developing, and curating DBLP, an extraordinarily useful and influential online bibliographic resource that has changed the way computer scientists work.

Michael Ley created DBLP, one of the first and most influential online computer science bibliographic information systems. His tour de force effort required vision, technical innovation, long-term dedication, and a strong commitment to service. DBLP provides highly reliable bibliographic data, setting standards for accuracy that are to this day unsurpassed. DBLP has changed the way the computer science community works. Researchers and practitioners use it to find relevant papers when exploring new areas, editors and program committee chairs use it when searching for reviewers, and authors use it to find relevant citations and make sure that the citations are correct. Through his work on DBLP, Michael Ley has made the enormous body of published computer science research more accessible and useful to the entire community. DBLP is now operated by a department of "Schloss Dagstuhl - Leibniz Center for Informatics" located at the University of Trier.

Arjen P. de Vries, Radboud University, The Netherlands

Twitter | https://twitter.com/arjenpdevries/status/1260599944676851714

Congratulations with the Distinguished Service award Michael Ley, and thank you for giving us DBLP

Gautam Kamath, University of Waterloo, ON, Canada

Twitter | https://twitter.com/thegautamkamath/status/1260958896660844544

We don't celebrate those who silently do amazing service enough in our community. DBLP's an institution, an incredibly useful & *accurate* bibliographic tool. I always take it for granted. Give it up for Michael Ley, who founded and ran it essentially single-handedly for 20 years

Tamer Özsu, University of Waterloo, ON, Canada

Twitter | https://twitter.com/ozsu/status/1261031681345105926

Congratulations Michael. I don't know where we would be without DBLP. I remember him typing by hand the TOCs of conference proceedings at Dagstuhl...

Department of Computer Science, University of Paderborn, Germany

Twitter | https://twitter.com/CompScience_UPB/status/1262289153099804673

Congratulations to Michael Ley and @dblp_org for this recognition of a very important community tool!

C. Mohan, Tsinghua University, China

Twitter | https://twitter.com/seemohan/status/1262862451915120640

#Database community is forever grateful to @dblp_ley. Michael created the wonderful bibliographic resource #DBLP @dblp_org. He just received #ACM #DistinguishedService #Award for it. Hearty congratulations Michael!

Shriram Krishnamurthi, Brown University, RI, USA

Twitter | https://twitter.com/ShriramKMurthi/status/1264585723216347136

Hey, let's all thank @dblp_ley for his work. There isn't a computer scientist on here who hasn't used DBLP. It's even in his Twitter handle! It's a pity most people don't know what the "DBLP" part stands for ... <-;

Resonanz zu Dagstuhl Publishing

5.3

Feedback on Dagstuhl Publishing

Im Prozess der Veröffentlichung von Konferenz-Proceedings, Zeitschriften-Artikeln und Büchern stehen wir in engem Kontakt mit den Herausgebern und Autoren. Rückmeldungen zu unseren Veröffentlichungsangeboten erhalten wir aber auch im Rahmen unserer regelmäßigen Befragungen der Teilnehmer von Dagstuhl-Seminaren oder Dagstuhl-Perspektiven-Workshops.

We are in close contact with editors and authors as part of the publishing procedures for conference proceedings, journal articles, and books. Additionally, we receive feedback regarding our publishing services in the questionnaires filled out by the participants of Dagstuhl Seminars or Dagstuhl Perspectives Workshops.

anonymous survey comment

Author/Editor Survey | https://www.dagstuhl.de/

I think Dagstuhl Publishing is doing excellent job regarding guidelines and instructions. The LaTeX style is very elegant.

anonymous survey comment

Author/Editor Survey | https://www.dagstuhl.de/

I thought it all went very smoothly and the style is very elegant. Congratulations, and thank you very much for this great service!

anonymous survey comment

Author/Editor Survey | https://www.dagstuhl.de/

I liked the way you encourage authors to publish full versions of their paper (and provide access to code). This is very beneficial for the scientific process. Overall, a very good experience. Quite smooth, and with lot of attention to quality.

anonymous survey comment

Author/Editor Survey | https://www.dagstuhl.de/

The new DSUB is *amazing*! I remember doing it for 2016 and the new submission system is far better. I mean, I am *really* impressed at how good it is.

Resonanz in Sozialen Netzwerken

Social Media Feedback

Jesper Agdakx

Twitter | https://twitter.com/agdakx/status/1283329505331945472

Huge props to @dagstuhl for not only providing open-access journals with reasonable author fees but also building the first paper submission site that's actually a pleasure to use. @TheOfficialACM, @CambridgeUP & others could really learn something.

Fig. 5.1
Spring cleaning in Dagstuhl's garden: During the temporary closure of our meeting center due to the pandemic, Dagstuhl staff were busy cleaning up the garden of Schloss Dagstuhl.

6 Die Seminare in 2020
The 2020 Seminars

Applications, Interdisciplinary Work

- Computational Metabolomics: From Cheminformatics to Machine Learning (20051)
- Tensor Computations: Applications and Optimization (20111)
- Decision-Making Modeling and Solutions for Smart Semiconductor Manufacturing (20452)

Artificial Intelligence, Computational Linguistics

- Spoken Language Interaction with Virtual Agents and Robots (SLIVAR): Towards Effective and Ethical Interaction (20021)
- Beyond Adaptation: Understanding Distributional Changes (20372)

Cryptography, Security, Privacy

- Symmetric Cryptography (20041)

Databases, Information Retrieval, Machine Learning, Data Mining

- Foundations of Composite Event Recognition (20071)

Data Structures, Algorithms, Complexity

- Scalability in Multiobjective Optimization (20031)
- Scheduling (20081)
- Resiliency in Numerical Algorithm Design for Extreme Scale Simulations (20101)

Geometry, Image Processing, Graphics, Visualization

- Interactive Visualization for Fostering Trust in AI (20382)

Software Technology, Programming Languages

- SE4ML – Software Engineering for AI-ML-based Systems(20091)

Verification, Logic, Formal Methods, Semantics

- SAT and Interactions (20061)

6.1 Spoken Language Interaction with Virtual Agents and Robots (SLIVAR): Towards Effective and Ethical Interaction

Organizers: Laurence Devillers, Tatsuya Kawahara, Roger K. Moore, and Matthias Scheutz

Seminar No. 20021

Date: January 5–10, 2020 | Dagstuhl Seminar
Full report – DOI: 10.4230/DagRep.10.1.1

Participants: Hugues Ali Mehenni, Gérard Bailly, Bruce Balentine, Roberto Basili, Timo Baumann, Michael C. Brady, Hendrik Buschmeier, Nick Campbell, Nigel Crook, Laurence Devillers, Johanna Dobbriner, Jens Edlund, Mary Ellen Foster, Emer Gilmartin, Manuel Giuliani, Martin Heckmann, Kristiina Jokinen, Tatsuya Kawahara, Casey Kennington, Evangelia Kordoni, Ivana Kruijff-Korbayová, Pierre Lison, Joseph J. Mariani, Cynthia Matuszek, Roger K. Moore, Mikio Nakano, Catherine Pelachaud, Roberto Pieraccini, Matthias Scheutz, David Schlangen, Abhishek Shrivastava, Gabriel Skantze, Lucy Skidmore, Serge Thill, David R. Traum, Matthew Walter, Lun Wang, Preben Wik

Motivation and aims

Recent times have seen growing interest in spoken language-based interaction between human beings and so-called "intelligent" machines. Presaged by the release of Apple's Siri in 2011, speech-enabled devices – such as Amazon Echo, Google Home, and Apple HomePod – are now becoming a familiar feature in people's homes. Coming years are likely to see the appearance of more embodied social agents (such as robots), but, as yet, there is no clear theoretical basis, nor even practical guidelines, for the optimal integration of spoken language interaction with such entities.

One possible reason for this situation is that the spoken language processing (SLP) and human-robot interaction (HRI) communities are fairly distinct, with only modest overlap. This means that spoken language technologists are often working with arbitrary robots (or limit themselves to conversational agents), and roboticists are typically using off-the-shelf spoken language components without too much regard for their appropriateness. As a consequence, an artefact's visual, vocal, and behavioural affordances are often not aligned (such as providing non-human robots with inappropriate human-like voices), and usability suffers – the human-machine interface is not "habitable".

These usability issues can only be resolved by the establishment of a meaningful dialogue between the SLP and HRI communities. Both would benefit from a deeper understanding of each other's methodologies and research perspectives through an open and flexible discussion. The aim of the seminar was thus to bring together a critical mass of researchers from the SLP and HRI communities in order to (i) provide a timely opportunity to review the critical open research questions, (ii) propose appropriate evaluation protocols for speech-based human-robot interaction, (iii) investigate opportunities to collect and share relevant corpora, and (iv) consider the ethical and societal issues associated with such machines.

Participants

A broad range of expertise was represented by the seminar participants, with a total of 38 attendees including industry experts, PhD students and academics from 14 different countries. The research areas of this interdisciplinary group included SLP, robotics, virtual agents, HRI, dialogue systems, natural language processing, as well as other intersections of SLIVAR.

Seminar overview

The seminar began with short presentations from all attendees, providing them an opportunity to introduce themselves and their research, as well as share their insights on challenges and opportunities in SLIVAR. The presentations were interwoven with four stimulus talks given by leading experts in their respective fields. In light of these presentations, participants formed discussion groups based on the clustering of related topics. The seminar's schedule was intentionally adaptable to allow for discussions to shift and new groups to form over the course of the week. Alongside discussions, "Show and Tell" sessions were organised to provide participants an opportunity to demonstrate their work and further stimulate discussion.

A non-exhaustive list of topics covered are outlined below along with a selection of the questions discussed within groups.

- Adaptability
  - *How do you cope with the frontier between user adaptation and system adaptation?*
  - *Are there representations that better enable adaptivity to users?*
- Architecture
  - *What are the desiderata for a spoken dialogue system-robot architecture?*
- Ethics
  - *What can we do as scientists and engineers to create ethical agents?*

- *Should a robot be able to pursue goals that you do not know?*

- Evaluation
  - *How do we evaluate HRI systems effectively and efficiently?*
  - *What are the existing evaluation approaches for SLIVAR?*
- Interaction
  - *How do we bridge the gap between dialogue management and interaction management?*
  - *What kind of interaction modules are useful for dialogue and why?*
- Multimodality
  - *What are the minimum representations units for different modalities?*
  - *What is the added value of multimodal features of spoken interaction in HRI?*
- Natural Language Understanding (NLU) Scalability
  - *How should we approach large scale supervised learning for NLU?*
- Speech in Action
  - *How can we create challenging interaction situations where speech performance is coordinated to a partner's action?*
- Usability
  - *What are the use cases for SLIVAR systems?*
  - *What is the role of physical or virtual embodiment?*

Seminar outcomes

The topics and questions outlined above facilitated a stimulating week of discussion and interdisciplinary collaboration, from which several next steps were established. These include participation in a number of workshops, special sessions and conferences, including but not limited to:

- SIGdial 2020 Special Session on Situated Dialogue with Virtual Agents and Robots [30]
- HRI 2020 Second Workshop on Natural Language Generation for HRI [31]
- IJCAI 2020 ROBOTDIAL Workshop on Dialogue Models for HRI [32]
- 29th IEEE International Conference on Robot & Human Interactive Communication [33]
- Interspeech 2020 [34]

Research and position papers were also discussed, specifically focusing on the evaluation and ethics of SLIVAR systems. For the former, suggestions included a survey of existing evaluation approaches, a report paper on issues in SLIVAR and HRI evaluation, and investigations into the automation of SLIVAR system objective evaluation. For the latter, next steps included a survey of existing architectures for embedded ethical competence and a position paper on ethical machine learning and artificial intelligence.

The final, and perhaps most valuable outcome of the seminar was the establishment of a new SLIVAR community. There was a strong enthusiasm for the discussions during the seminar to continue with a second SLIVAR meeting, as well as suggestions for growing the community through the formal establishment of a special interest group. Overall, the seminar provided a unique opportunity to create a foundation for collaborative research in SLIVAR which will no doubt have a positive impact on future work in this field.

[30] https://www.sigdial.org/files/workshops/conference21/
[31] https://hbuschme.github.io/nlg-hri-workshop-2020/
[32] http://sap.ist.i.kyoto-u.ac.jp/ijcai2020/robotdial/
[33] http://ro-man2020.unina.it/
[34] http://www.interspeech2020.org/

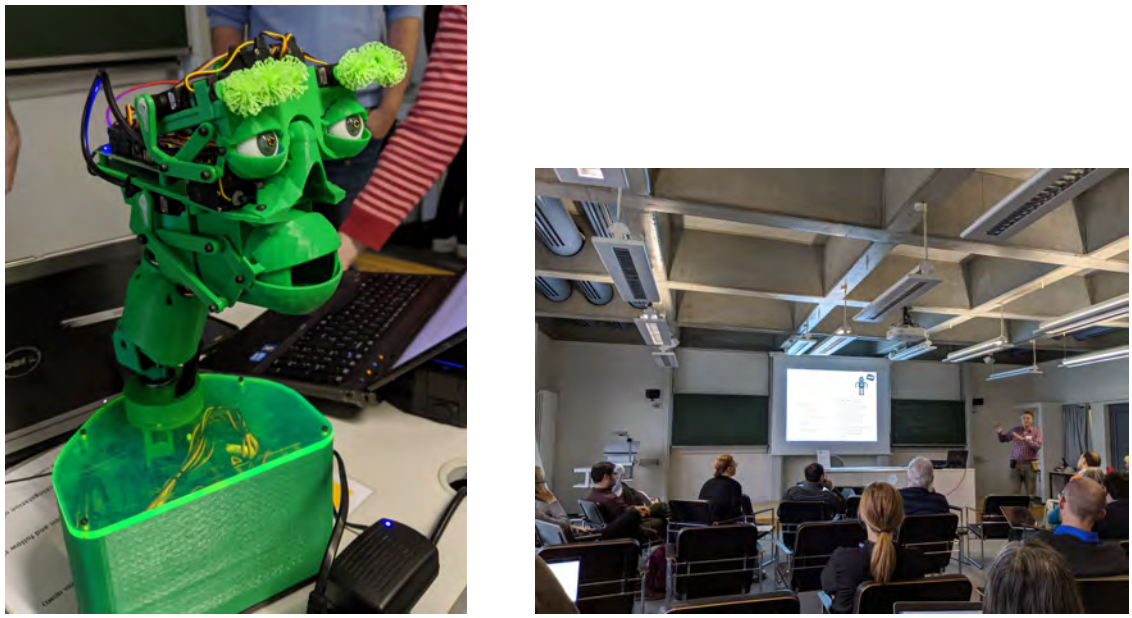


Fig. 6.1
Impressions from Dagstuhl Seminar 20021. Photo courtesy of Roberto Pieraccini.

6.2 Scalability in Multiobjective Optimization

Organizers: Carlos M. Fonseca, Kathrin Klamroth, Günter Rudolph, and Margaret M. Wiecek

Seminar No. 20031

Date: January 12–17, 2020 | Dagstuhl Seminar
Full report – DOI: 10.4230/DagRep.10.1.52

Participants: Richard Allmendinger, Mickaël Binois, Fritz Bökler, Jürgen Branke, Dimo Brockhoff, Carlos A. Coello Coello, Kerstin Dächert, Matthias Ehrgott, Gabriele Eichfelder, Michael Emmerich, Georges Fadel, José Rui Figueira, Carlos M. Fonseca, Andreia P. Guerreiro, Jussi Hakanen, Susan R. Hunter, Hisao Ishibuchi, Andrzej Jaszkiewicz, Pascal Kerschke, Kathrin Klamroth, Karl Heinz Küfer, Arnaud Liefooghe, Manuel López-Ibánez, Kaisa Miettinen, Sanaz Mostaghim, Boris Naujoks, Luís Paquete, Patrick M. Reed, Enrico Rigoni, Günter Rudolph, Stefan Ruzika, Serpil Sayin, Anita Schöbel, Britta Schulze, Pradyumn Kumar Shukla, Ralph E. Steuer, Michael Stiglmayr, Christiane Tammer, Heike Trautmann, Tea Tusar, Daniel Vanderpooten, Margaret M. Wiecek

To continue being useful to society, MO has to address new challenges brought to science and engineering by big data that are continuously being produced and stored with a much lower cost than ever in the past. Since massive production of data takes place in the areas of human activity that have traditionally benefited from MCDM (e.g., social media analysis, retail sales, or high-frequency finance), MO needs to enter a new stage of development to be able to handle the high-dimensional data. Driven by this increasing availability of data and also motivated by an unprecedented demand for efficient, reliable and robust optimization methods, research in MO has to focus on the particular difficulties arising in large-scale problems. This requires from MCDM researchers new statistical thinking and leads to an increasing demand for efficient solution methods for large-scale problems, involving *many* objective functions and/or constraints, *many* decision makers, *many* variables and large amounts of data.

In this spirit, the focus in the seminar was on *scalability* which has become a universal challenge for mathematical optimization, and for EMO *and* MCDM in particular. *Scalability* is a characteristic of a system that describes its capability to cope and perform under an increased or expanding workload. A system that scales well will be able to maintain or even increase its level of performance or efficiency when tested by larger operational demands. In an economic context, a company's scalability implies that the underlying business model offers the potential for economic growth within the company. Therefore the main goals of the seminar were the exploration and elucidation of scalability in three fundamental domains: MO with many objective functions, MO with many decision makers, and MO with many variables.

While single objective optimization problems possess (at most) one optimal objective value, biobjective optimization problems are already intractable in many cases, i.e., combinatorial problems such as, for example, shortest path and spanning tree problems, may have an exponential number of nondominated solutions. Going from two to three objectives is another major step in difficulty since there does no longer exist a complete ordering of nondominated solutions. Problems with *many objective functions* pose even greater challenges. Since the number of nondominated solutions generally grows exponentially with the number of objective functions (as long as these are conflicting), efficient strategies for the detection of redundancies, for model reduction and for metamodelling are crucial for the scalability of existing methods. In the domain of MO with many objective functions the following specific topics were addressed:

- *Model building* and the derivation of technical properties are crucial for understanding the specific challenges in many-objective optimization. The following topics were undertaken: (i) Identification of interdependencies between objective functions as compared to real conflict; (ii) Relevance of many objective functions to a given real-life decision-making situation; (iii) Exploration of mathematical or statistical tools that can compress information while retaining the important problem features. Methodological approaches in this context included data analysis, metamodelling, partial and full scalarization, and a new concept for approximation schemes with quality guarantees.
- Concise *representations* are indispensable for the development of efficient algorithms, particularly EMO algorithms, interactive approaches, and decision support tools. The scalability of quality measures and associated representations, including hypervolume, uniformity, coverage, and ε-indicator were discussed and novel representation and visualization paradigms suitable for many-objective optimization were proposed.
- *Efficient solution algorithms* that scale well with an increasing number of objective functions or computationally expensive

objective functions are needed. The shortcomings of existing methods were discussed and new strategies that are specifically designed for large-scale problems were derived.
- *Scalable test cases* are needed for the evaluation of the developed approaches. This has been a concern of the EMO community to some extent. The difficulties pertaining to construction of the test cases were identified and future work in this direction was proposed.

The discussion of MO with many decision makers considered the inherent changes in the decision process as soon as there is not just a single decision maker. The focus was on building a formal framework that guarantees a fair decision respecting the preferences of all decision makers with the least total loss.

The domain of MO with many variables was discussed jointly with the domain of MO with many objective functions because large-scale optimization problems involving many variables and large amounts of data often also involve many objective functions. However, an emphasis was put on the required adaptations of EMO and MCDM approaches to handle problems with a high-dimensional decision space. While EMO algorithms often scale relatively well with an increasing dimension of the decision space (at least as long as the number of objective functions remains relatively small), this is in general not the case for MCDM approaches. In particular, the most commonly used exact solution approaches, such as dynamic programming and branch and bound, suffer from the curse of dimensionality. Complexity theoretic aspects were discussed and the use of approximation paradigms, metamodelling, hybridization, or parallelization in this situation was investigated.

During the seminar the schedule was updated on a daily basis to maintain flexibility in balancing time slots for talks, discussions, and working groups, and to integrate in the program the talks whose authors were inspired by the ongoing seminar. The working groups were established on the first day in an interactive fashion. Starting with three large working groups focused around the three central topics of the seminar (MO with many objectives, MO with many decision makers, and MO with many variables), each participant was requested to formulate her/his favorite topics and most important challenges.

The three groups then rejoined and the prevailing topics were put into groups through a natural clustering process while the participants made up initial five working groups. During the week the participants were allowed to change the working groups while some groups split. Overall, the teams remained fairly stable throughout to eventually form eight groups by the end of the seminar. Abstracts of the talks and extended abstracts of the eight working groups can be found in in the full version of the report.

Further notable events during the week included: (i) an invitation to the opening of the art exhibition with paintings of the artist Lola Sprenger, (ii) a hike during a time period with the best (!) weather conditions in the entire week, (iii) a presentation session allowing the participants to share details of upcoming events in the research community, and (iv) a wine and cheese party (see Fig. 6.2) made possible by a donation of *Fraunhofer-Institut für Techno- und Wirtschaftsmathematik (ITWM)* represented by Karl-Heinz Küfer. The participants are pleased to announce that they made a donation to Schloss Dagstuhl to make a painting by Lola Sprenger entitled "Berg und Tal" part of the permanent art display.

Fig. 6.2
Traditional wine & cheese party.

Offers and Needs Market

A major innovation to this seminar was the *Offers & Needs Market* open for the entire week. The participants could write their research offers and needs regarding MO on notepads in different colors and post on pin boards (see fig. 6.3) to attract or find a possible collaborator. The idea was well received and the participants desired its repetition in future events.

Outcomes

The outcomes of each of the working groups can be seen in the sequel. Extended versions of their findings will be submitted to a Special Issue of *Computers and Operations Research* entitled "Modern Trends in Multiobjective Optimization" and guest-edited by the organizers of this Dagstuhl Seminar.

This seminar resulted in a very insightful, productive and enjoyable week. It has already led to first new results and formed new cooperation, research teams and topics.

Fig. 6.3
Offers and needs market.

Acknowledgements

The organizers would like to express their appreciation to the Dagstuhl office and its helpful and patient staff for their professional and smooth cooperation; huge thanks to the organizers of the previous seminars in this series for setting us up for success; and thanks to all the participants, who worked hard and were amiable company all week. In a later section, we also give special thanks to Kathrin Klamroth and Günter Rudolph as they step down from the organizer role.

6.3 Symmetric Cryptography

Organizers: Nils Gregor Leander, Bart Mennink, Kaisa Nyberg, and Kan Yasuda

Seminar No. 20041

Date: January 19–24, 2020 | Dagstuhl Seminar
Full report – DOI: 10.4230/DagRep.10.1.130

Participants: Elena Andreeva, Frederik Armknecht, Christof Beierle, Daniel J. Bernstein, Eli Biham, Christina Boura, Anne Canteaut, Joo Yeon Cho, Itai Dinur, Christoph Dobraunig, Orr Dunkelman, Maria Eichlseder, Patrick Felke, Henri Gilbert, Lorenzo Grassi, Tetsu Iwata, Pierre Karpman, Dmitry Khovratovich, Virginie Lallemand, Tanja Lange, Nils Gregor Leander, Gaëtan Leurent, Stefan Lucks, Atul Luykx, Willi Meier, Florian Mendel, Bart Mennink, Kazuhiko Minematsu, Maria Naya-Plasencia, Kaisa Nyberg, Léo Perrin, Bart Preneel, Yann Rotella, Arnab Roy, Yu Sasaki, Ling Song, Meltem Sonmez Turan, Marc Stevens, Stefano Tessaro, Emmanuel Thomé, Yosuke Todo, Aleksei Udovenko, Damian Vizár, Kan Yasuda

IT Security plays a crucial role in everyday life and business. Virtually all modern security solutions are based on cryptographic primitives. *Symmetric* cryptography deals with the case that both the sender and the receiver of a message are using the same key and is highly relevant not only for academia, but also for industrial research and applications.

We identified the following areas as among the most important topics for future research.

Cryptography in the presence of strong constraints. This area deals with the development of symmetric cryptographic primitives and modes that must operate under strong constraints. The area, often indicated by the misleading term lightweight cryptography, has become a very active research field in recent years.

Proving relevant bounds for permutations and (tweakable) block ciphers. Security arguments for symmetric cryptographic primitives often rely on simplifying assumptions and unproven heuristics. Moreover, not only are they often limited by those simplifications, but more fundamentally by the resulting statements.

Development of modes for dedicated functionality or robustness. A cryptographic primitive, e.g., a cryptographic permutation or a (tweakable) block cipher, is of little use without being embedded in a suitable mode of operation. Traditional modes turn such a primitive into an (authenticated) encryption scheme, a message authentication code or a hash function. However, modes of operations could provide more advanced functionalities on the one hand and advanced security features on the other hand.

Quantum cryptanalysis. The threat that one would be able to build a sufficiently large quantum computer has a major impact on the security of many cryptographic schemes we are using today. In particular, the seminal work of Shor showed that such computers would allow to factor large integers and compute discrete logs over large groups in practical time. In the case of symmetric cryptography, the situation seems less critical – but is also significantly less studied. For almost 20 years, it was believed that the only advantage an attacker would have by using a quantum computer when attacking symmetric cryptography is due to Grover's algorithm for speeding up brute force search. Only recently researchers have started to investigate in more detail how the security of symmetric primitives would be affected by attackers equipped with quantum computers.

Seminar Program

The seminar program consisted of short presentations and group meetings. Presentations were about the above topics and other relevant areas of symmetric cryptography, including state-of-the-art cryptanalytic techniques and new designs. Below one can find the list of abstracts for talks given during the seminar. Also, participants met in smaller groups and spent a significant portion of the week, each group intensively discussing a specific research topic. There were eight research groups: 1) Design and analyze ciphers over prime fields, 2) Bounds on the degree of Feistel ciphers with round functions with low univariate degree, 3) Forkcipher, 4) Time-space tradeoffs, 5) Quantum cryptanalysis of hash functions, 6) NIST LWC, 7) Cryptanalysis of the Russian standards, and 8) Security of ProMACs. On the last day of the week the leaders of each group gave brief summaries of achievements. Some teams continued working on the topic after the seminar and started new research collaborations.

6.4 Computational Metabolomics: From Cheminformatics to Machine Learning

Organizers: Sebastian Böcker, Corey Broeckling, Emma Schymanski, and Nicola Zamboni

Seminar No. 20051

Date: January 26–31, 2020 | Dagstuhl Seminar
Full report – DOI: 10.4230/DagRep.10.1.144

Participants: Oliver Alka, Nikiforos Alygizakis, Sebastian Böcker, Evan Bolton, Corey Broeckling, Celine Brouard, Andrea Brunner, Jacques Corbeil, Alexis Delabriere, Pieter Dorrestein, Xiuxia Du, Timothy Ebbels, Markus Fleischauer, Laurent Gatto, Kati Hanhineva, Rick Helmus, Lukas Käll, Oliver Kohlbacher, Adelene Lai Shuen Lyn, Jan Lisec, Marcus Ludwig, Tytus Mak, Hiroshi Mamitsuka, Ewy Mathé, Hunter Moseley, Steffen Neumann, Louis-Felix Nothias-Scaglia, Jamie Nunez, Tomas Pluskal, Stacey N. Reinke, Simon Rogers, Juho Rousu, Augustin Scalbert, Tobias Schulze, Emma Schymanski, Christoph Steinbeck, Michael Andrej Stravs, Justin van der Hooft, Philip Wenig, Egon Willighagen, David Wishart, Michael Anton Witting, Oscar Yanes, Nicola Zamboni

Mass spectrometry is the predominant analytical technique for detection, identification, and quantification in metabolomics experiments. Technological advances in mass spectrometry and experimental workflows during the last decade enabled novel investigations of biological systems on the metabolite level. Metabolomics started as the study of all metabolites in a living cell or organism; in comparison to transcriptome and proteome, the metabolome is a better proxy of metabolic activity. Emerging fields including personalized medicine and exposomics have expanded the scope of metabolomics to "all" small molecules, including those of non-biological origin. Advances in instrumentation plus rapid increase in popularity, throughput and desired compound coverage has resulted in vast amounts of both raw and processed data; the field is in desperate need for further developments in computational methods. Methods established in other -omics fields are frequently not transferable to metabolomics due to the structural diversity of small molecules. This third Dagstuhl Seminar on Computational Metabolomics (following Seminars 15492 and 17491) focused on cheminformatics and machine learning. The seminar was less structured than previous seminars, forming break-out sessions already from Monday afternoon, then collecting participants back into plenary sessions at regular intervals for discussions and further topic exploration. The major topics launched on Monday included cheminformatics, genome mining and autoencoders, which were developed throughout the day. Other topics discussed throughout the week included biosynthesis and gene clusters, confidence and compound identification, spectral versus structural similarity, statistical integration, collision cross section (CCS) and ion mobility separation (IMS), benchmarking data, open feature file format, exposomics, data processing and acquisition. Several evening sessions were also held, including retention time, Bioschemas, MassBank, ethics and philosophy of software development, open biological pathways, mass spec health check, Jupyter notebooks, a mini decoy session and a session on coding tips. The excursion, breaking with previous Christmas Market traditions, was to the Völklingen steelworks. Finally, the entire seminar was wrapped up with a discussion on the future of untargeted metabolomics on Friday – time will tell what the future Computational Metabolomics Seminars will bring. A further seminar in the series may be considered for the end of 2021 or in 2022.

6.5 SAT and Interactions

Organizers: Olaf Beyersdorff, Uwe Egly, Meena Mahajan, and Cláudia Nalon

Seminar No. 20061

Date: February 2–7, 2020 | Dagstuhl Seminar
Full report – DOI: 10.4230/DagRep.10.2.1

Participants: Olaf Beyersdorff, Joshua Lewis Blinkhorn, Benjamin Böhm, Ilario Bonacina, Florent Capelli, Leroy Nicholas Chew, Judith Clymo, Nadia Creignou, Anupam Das, Susanna de Rezende, Akhil Dixit, Clare Dixon, Uwe Egly, Vijay Ganesh, Azza Gaysin, Edward A. Hirsch, Ullrich Hustadt, Mikoláš Janota, Jan Johannsen, Hans Kleine Büning, Oliver Kullmann, Massimo Lauria, Meena Mahajan, Joao Marques-Silva, Barnaby Martin, Stefan Mengel, Claudia Nalon, Jakob Nordström, Dirk Pattinson, Tomáš Peitl, Renate Schmidt, Uwe Schöning, David R. Sherratt, Anil Shukla, Friedrich Slivovsky, Gaurav Sood, Lutz Straßburger, Jacobo Torán, Marc Vinyals, Florian Wörz

The problem of deciding whether a propositional formula is satisfiable (SAT) is one of the most fundamental problems in computer science, both theoretically and practically. Its theoretical significance derives from the Cook-Levin Theorem, identifying SAT as the first NP-complete problem. Since then SAT has become a reference for an enormous variety of complexity statements, among them the celebrated P vs NP problem: one of seven million-dollar Clay Millennium Problems. Due to its NP hardness, SAT has been classically perceived as an intractable problem, and indeed, unless $\mathsf{P} = \mathsf{NP}$, no polynomial-time algorithm for SAT exists.

There are many generalisations of the SAT problem to further logics, including quantified Boolean formulas (QBFs) and modal and temporal logics. These logics present even harder satisfiability problems as they are associated with complexity classes such as PSPACE, which encompasses NP. However, QBFs, modal and temporal logics can express many practically relevant problems far more succinctly, thus applying to more real-world problems from artificial intelligence, bioinformatics, verification, and planning.

Due to its practical implications, intensive research has been performed on how to solve SAT problems in an automated fashion. The last decade has seen the development of practically efficient algorithms for SAT, QBFs and further logics and their implementation as solvers, which successfully solve huge industrial instances.

Very often, these developments take place within different communities, e.g., there has been almost no interaction between the areas of SAT/QBF solving and solving for modal logics.

The main aim of the proposed Dagstuhl Seminar therefore was to bring together researchers from proof complexity and proof theory, SAT, MaxSAT and QBF solving, and modal logics so that they can communicate state-of-the-art advances and embark on a systematic interaction that will enhance the synergy between the different areas. As such the seminar was the first workshop (in Dagstuhl and elsewhere) to unite researchers working on both theory and practice of propositional SAT, QBF, and modal logics. One of the specific aims was to foster more interaction between these different communities with the goal to transfer the success of theoretical research on SAT to further logics and SAT problems.

To facilitate such interactions, the seminar included a number of survey talks to introduce neighbouring communities to the main notions, results, and challenges of the represented areas. The following survey talks were given during the seminar:

- Massimo Lauria: Proof Complexity: A Survey,
- Lutz Straßburger: Introduction to Deep Inference,
- Vijay Ganesh: Machine Learning and Logic Solvers: The Next Frontier,
- Mikoláš Janota: QBF Solving and Calculi: An Overview,
- João Marques-Silva: Practical MaxSAT Solving: A Survey,
- Cláudia Nalon: Modal Logics: An Overview.

Each of these surveys was accompanied by one or more sessions with contributed talks dedicated to recent specific results of the field.

The seminar also included an open discussion session on ‘Future Directions of Research’, where ideas for a closer interaction between theoretical fields such as proof theory and proof complexity and practical fields such as SAT/QBF and modal solving were discussed.

The organisers believe that the seminar fulfilled their original high goals: most talks were a great success and many participants reported about the inspiring seminar atmosphere, fruitful interactions, and a generally positive experience. The organisers and participants wish to thank the staff and the management of Schloss Dagstuhl for their assistance and excellent support in the arrangement of a very successful and productive event.

6.6 Foundations of Composite Event Recognition

Organizers: Alexander Artikis, Thomas Eiter, Alessandro Margara, and Stijn Vansummeren

Seminar No. 20071

Date: February 9–14, 2020 | Dagstuhl Seminar
Full report – DOI: 10.4230/DagRep.10.2.19

Participants: Elias Alevizos, Alexander Artikis, François Bry, Diego Calvanese, Daniele Dell'Aglio, Emanuele Della Valle, Thomas Eiter, David Eyers, Avigdor Gal, Minos Garofalakis, Alejandro J. Grez, Sylvain Hallé, Manfred Hauswirth, Fredrik Heintz, Annika M. Hinze, Boris Koldehofe, Danh Le Phuoc, Alessandro Margara, Wim Martens, Ruben Mayer, Angelo Montanari, Boris Motik, Thomas Prokosch, Umakishore Ramachandran, Tore Risch, Cristian Riveros, Till Rohrmann, Kurt Rothermel, Sabri Skhiri, Kostas Stathis, Riccardo Tommasini, Martin Ugarte, Jacopo Urbani, Han van der Aa, Stijn Vansummeren, Matthias Weidlich, Thomas Zeume, Holger Ziekow

Composite Event Recognition (CER for short) refers to the activity of detecting patterns in streams of continuously arriving "event" data over, possibly geographically, distributed sources. CER is a key ingredient of many contemporary Big Data applications that require the processing of such event streams in order to obtain timely insights and implement reactive and proactive measures. Examples of such applications include the recognition of attacks in computer network nodes, human activities on video content, emerging stories and trends on the Social Web, traffic and transport incidents in smart cities, error conditions in smart energy grids, violations of maritime regulations, cardiac arrhythmia, and epidemic spread. In each application, CER allows to make sense of streaming data, react accordingly, and prepare for counter-measures.

CER systems become increasingly important as we move from an information economy to an "intelligent economy", where it is not only the accessibility to information that matters but also the ability to analyse, reason, and act upon information, creating competitive advantage in commercial transactions, enabling sustainable management of communities, and promoting appropriate distribution of social, healthcare, and educational services. Current businesses tend to be unable to make sense of the amounts of data that are generated by the increasing number of distributed data sources that are becoming available daily, and rely more and more on CER. As an example, traffic management in smart cities requires the analysis of data from an increasing number of sensors, both mobile (mounted on public transport vehicles and private cars) and stationary (installed on intersections). Using such data streams, CER may be used to detect or even forecast traffic congestions, thus allowing for proactively changing traffic light policies and speed limits, with the aim of reducing carbon emissions, optimising public transportation, and improving the quality of life and productivity of commuters. As another example, in smart energy grids, streaming information from power grid elements sensors, end-user devices, and diverse other sources such as weather forecasts and event schedules can be combined through CER to improve the grid efficiency and meet the rapidly increasing electricity demand.

Numerous CER systems and languages have been proposed in the literature. While these systems have a common goal, they differ in their architectures, data models, pattern languages, and processing mechanisms, resulting in many heterogeneous implementations with sometimes fundamentally different capabilities. Their comparative assessment is further hindered by the fact that they have been developed in different communities, each bringing in their own terminology and view of the problem.

Moreover, the established CER literature focuses on the practical system aspects of CER. As a result, little work has been done on its formal foundations. Consequently, and in contrast to the situation for more traditional fields in Computer Science, we currently lack a common understanding of the trade-offs between expressiveness and complexity in the design of CER systems, as well as an established theory for comparing their fundamental capabilities.

As such, currently, CER frameworks are difficult to understand, extend and generalise. It is unclear which of the proposed approaches better meets the requirements of a given application domain, in terms of capturing the intended meaning of the composite events of interest, as well as detecting them efficiently. Furthermore, the lack of foundations makes it hard to leverage established results – from automata theory, temporal logics, etc – thus hindering scientific and technological progress in CER.

At the same time, recent years have witnessed increased activities in diverse fields of Computer Science on topics that are related to CER: Inductive and deductive reasoning over streaming data, a field known as Stream Reasoning in Artificial Intelligence. Theoretical complexity results related to processing database queries under updates, associated with advances in Incremental

View Maintenance in Database Research. Expressiveness and complexity of logics in the dynamic setting, in Logic research.

The seminar brought together 39 researchers and practitioners working in domains that are strictly related to CER. The first days of the seminar mainly focused on tutorials and talks that gave an overview of the approaches, techniques, methodologies, and vocabularies used in different communities to refer to CER problems. In particular, the following tutorials were presented:

- Applications and requirements for CER
- CER in data management
- CER in distributed event-based systems
- Stream reasoning
- CER in logic and AI
- CER in business process management

The seminar continued by alternating sessions with focused research talks and group discussions on the following topics, that the participants identified as the most relevant for future investigations and research efforts:

- CER language formalisms
- Towards a common framework for CER expressiveness and complexity
- Evaluation strategies: parallel and distributed processing
- Uncertainty in CER
- Pattern induction and composite event forecasting
- Benchmarking

The final sessions of the seminar focused on reporting the results of the group discussions and in planning follow-up activities, including co-organized workshops and events, joint publications, and projects.

6.7 Scheduling

Organizers: Nicole Megow, David Shmoys, and Ola Svensson

Seminar No. 20081

Date: February 16–21, 2020 | Dagstuhl Seminar
Full report – DOI: 10.4230/DagRep.10.2.50

Participants: Antonios Antoniadis, Yossi Azar, Etienne Bamas, Sanjoy K. Baruah, Shuchi Chawla, Christian Coester, Sami Davies, Christoph Dürr, Franziska Eberle, Thomas Erlebach, Naveen Garg, Tobias Harks, Ruben Hoeksma, Sungjin Im, Sven Jäger, Xinrui Jia, Thomas Kesselheim, Samir Khuller, Max Klimm, Peter Kling, Amit Kumar, Marilena Leichter, Jan Karel Lenstra, Alberto Marchetti-Spaccamela, Sebastien Martin, Jannik Matuschke, Nicole Megow, Rolf H. Möhring, Sarah Morell, Benjamin J. Moseley, Kamesh Munagala, Viswanath Nagarajan, Seffi Naor, Neil Olver, Britta Peis, Kirk Pruhs, Jens Quedenfeld, Shijin Rajakrishnan, Lars Rohwedder, Thomas Rothvoss, Guido Schäfer, Kevin Schewior, Jiri Sgall, David Shmoys, Bertrand Simon, René Sitters, Martin Skutella, Clifford Stein, Leen Stougie, Ola Svensson, Éva Tardos, Vera Traub, Marc Uetz, Rob van Stee, Laura Vargas Koch, Victor Verdugo, Jose Verschae, Tjark Vredeveld, Andreas Wiese

This seminar was the sixth in a series of Dagstuhl "Scheduling" seminars (since 2008). Scheduling is a major research field that is studied from a practical and theoretical perspective in computer science, mathematical optimization, and operations research. Applications range from traditional production scheduling and project planning to the newly arising resource management tasks in the advent of internet technology and shared resources.

This edition of the seminar focused on the interplay between scheduling problems and problems that arise in the management of traffic. There are several notable aspects of the scheduling problems that arise particularly in this context:

- the role of dynamic decision-making in which data-driven approaches emerge (especially those that have stochastic elements in modelling multi-stage decision-making);
- the interplay between scheduling aspects and what might be viewed as routing aspects, providing a spacial component to the nature of the scheduling problem;
- the tension between questions of coordination and competition that arise from the fact that, for many of the issues in this domain, there are significant questions that depend on the extent to which the traffic can be centrally coordinated.

Since the community working on the intersection of scheduling and traffic is itself rather broad, the seminar focused on researchers whose methodological focus relies on tools from the theoretical design of algorithms, on mathematical optimization methods, and on the combination of optimization and game-theoretic approaches.

Organization of the seminar. The seminar brought together 59 researchers from theoretical computer science, mathematical optimization and operations research. The participants consisted of both senior and junior researchers, including a number of postdocs and advanced PhD students.

During the five days of the seminar, 31 talks of different lengths took place. Four keynote speakers gave an overview of the state-of-the art of the respective area in 60 minutes:

- Shuchi Chawla: Mechanisms for resource allocation
- Benjamin Moseley: Combinatorial Optimization Augmented with Machine Learning
- Evá Tardos: Learning in Games and in Queueing Systems
- Vera Traub: Approximation algorithms for traveling salesman problems.

The remaining slots were filled with shorter talks of 30 minutes on various topics related to scheduling, routing, transportation, mechanism design, learning, and applications in practice. Another highlight of the seminar was a historical note given by Jan Karel Lenstra with his view on the dynamic development of the area of scheduling in the past 60 years. Further, in the beginning of the week, open problem sessions were held. Throughout the week, a few sessions with spotlight talks of 8 minutes gave participants the chance to announce recent results and invite for discussions. The schedule left ample free time that was actively used for fruitful discussions and joint research.

Outcome. Organizers and participants regard the seminar as a great success. The seminar achieved the goal to bring together the related communities, share the state-of-the art research and discuss the current major challenges. The talks were excellent and very stimulating; participants actively met in working groups in the afternoon and evenings. It was remarked very positively that a significant number of younger researchers (postdocs and PhD students) participated and integrated very well.

The organizers wish to express their gratitude towards the Scientific Directorate and the administration of the Dagstuhl Center for their great support for this seminar.

6.8 SE4ML – Software Engineering for AI-ML-based Systems

Organizers: Kristian Kersting, Miryung Kim, Guy Van den Broeck, and Thomas Zimmermann

Seminar No. 20091

Date: February 23–28, 2020 | Dagstuhl Seminar
Full report – DOI: 10.4230/DagRep.10.2.76

Participants: Hadil Abukwaik, Molham Aref, Earl T. Barr, Houssem Ben Braiek, Pavol Bielik, Carsten Binnig, Luc De Raedt, Rob DeLine, Joachim Giesen, Elena Leah Glassman, Nikolas Göbel, Jin L.C. Guo, Barbara Hammer, Fabrice Harel-Canada, Ahmed E. Hassan, Steven Holtzen, Christian Kästner, Kristian Kersting, Miryung Kim, Angelika Kimmig, Parisa Kordjamshidi, Vu Le, Rupak Majumdar, Tim Menzies, Andreas Metzger, Mira Mezini, Alejandro Molina, Sandeep Neema, Siegfried Nijssen, Andrea Passerini, Michael Pradel, Christopher Ré, Sameer Singh, Daniel Speicher, Isabel Valera, Guy Van den Broeck, Antonio Vergari, Laurie Williams, Ce Zhang, Jie Zhang, Tianyi Zhang, Xiangyu Zhang, Thomas Zimmermann

Any AI- and ML-based systems will need to be built, tested, and maintained, yet there is a lack of established engineering practices in industry for such systems because they are fundamentally different from traditional software systems. Building such systems requires extensive trial and error exploration for model selection, data cleaning, feature selection, and parameter tuning. Moreover, there is a lack of theoretical understanding that could be used to abstract away these subtleties. Conventional programming languages and software engineering paradigms have also not been designed to address challenges faced by AI and ML practitioners. This seminar brainstormed ideas for developing a new suite of ML-relevant software development tools such as debuggers, testers and verification tools that increase developer productivity in building complex AI systems. It also discussed new innovative AI and ML abstractions that improve programmability in designing intelligent systems.

The seminar brought together a diverse set of attendees, primarily coming from two distinct communities: software engineering and programming languages vs. AI and machine learning. Even within each community, we had attendees with various backgrounds and a different emphasis in their research. For example, within software engineering the profile of our attendees ranged from pure programming languages, development methodologies, to automated testing. Within, AI, this seminar brought together people on the side of classical AI, as well as leading experts on applied machine learning, machine learning systems, and many more. We also had several attendees coming from adjacent fields, for example attendees whose concerns are closer to human-computer interaction, as well as representatives from industry. For these reasons, the first two days of the seminar were devoted to bringing all attendees up to speed with the perspective that each other field takes on the problem of developing, maintaining, and testing AI/ML systems.

On the first day of the seminar, Ahmed Hassan and Tim Menzies represented the field of software engineering. Their talks laid the foundation for a lot of subsequent discussion by presenting some key definitions in software engineering for machine learning (SE4ML), identifying areas where there is a synergy between the fields, informing the seminar about their experiences dealing with industry partners, and listing some important open problems. Sameer Singh and Christopher Ré took care of the first day's introduction to machine learning. Christopher Ré described recent efforts in building machine learning systems to help maintain AI/ML systems, specifically for managing training data, and monitoring a deployed system to ensure it keeps performing adequately. Sameer Singh's talk focused on bug finding, and debugging machine learning systems, either by inspecting black-box explanations, generating realistic adversarial examples in natural language processing (NLP), and doing behavioral testing of NLP models to make them more robust.

The second day of the seminar continued to introduce the attendees to some prominent approaches for tackling the SE4ML problem. Elena Glassman presented her work at the intersection of human-computer interaction and software engineering, while Jie Zhang gave an overview of software testing for ML, based on her recent survey of the field. Significant attention during the seminar was spent on the problem of deploying machine learning models in environments that change over time, where the behavior of the AI/ML system diverges from the intended behavior when the model was first developed. For example, such issues were discussed by Barbara Hammer in her talk on machine learning in non-stationary environments. Isabel Valera introduced the seminar to another important consideration when developing AI/ML-based systems: interpretability and algorithmic fairness. Andrea Passerini's talk was aimed at explaining some of the basic principles of machine learning for a non-machine learning audience; for example generalization, regularization, and overfitting, as well as some recent trands in combining learning with symbolic reasoning.

The remainder of the seminar was centered around various breakout sessions and working groups, including sessions on (1) Specifications and Requirements, (2) Debugging and Testing, (3) Model Evolution and Management, and (4) Knowledge Transfer and Education. There were extended discussions on the question "what is a bug?" in an AI/ML setting, what is a taxonomy of such bugs, and can we list real-world examples of such bugs happening in practice. Interleaved with these working groups, there were several demand-driven talks, designed to answer questions that came up during the discussions. For example, Steven Holtzen and Parisa Kordjamshidi introduced the seminar to efforts in the AI community to build higher-level languages for machine learning, in particular probabilistic programming and declaritive learning-based programming. Christian Kästner shared his insights from teaching software engineering for AI/ML-based systems using realistic case studies. Molham Aref gave his unique view on developing such systems from industry, which was a tremendously valuable perspective to include in these discussions.

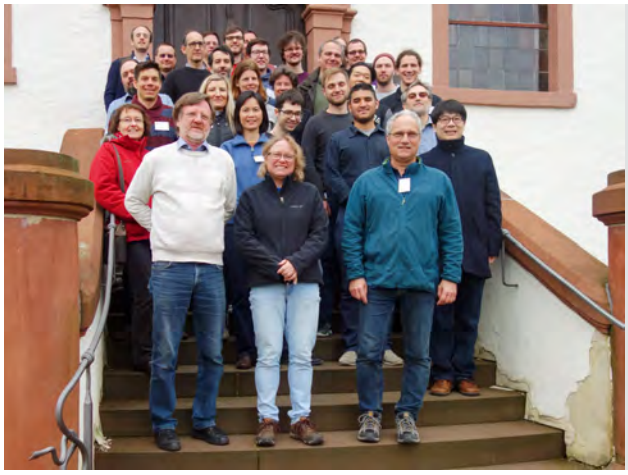
Overall, this seminar produced numerous new insights into how complex AI-ML systems are designed, debugged, and tested. It was able to build important scientific bridges between otherwise disparate fields, and has spurred collaborations and follow-up work.

6.9 Resiliency in Numerical Algorithm Design for Extreme Scale Simulations

Organizers: Luc Giraud, Ulrich Rüde, and Linda Stals

Seminar No. 20101

Date: March 1–6, 2020 | Dagstuhl Seminar
Full report – DOI: 10.4230/DagRep.10.3.1



Participants: Emmanuel Agullo, Mirco Altenbernd, Hartwig Anzt, Leonardo Bautista-Gomez, Tommaso Benacchio, Luca Bonaventura, Hans-Joachim Bungartz, Florina M. Ciorba, Nathan DeBardeleben, Daniel Drzisga, Sebastian Eibl, Christian Engelmann, Luc Giraud, Dominik Göddeke, Marco Heisig, Fabienne Jézéquel, Nils Kohl, Xiaoye Sherry Li, Miriam Mehl, Michael Obersteiner, Enrique S. Quintana-Ortí, Ulrich Rüde, Martin Schulz, Feng Shilu, Robert Speck, Linda Stals, Keita Teranishi, Dominik Thönnes, Andreas Wagner, Barbara Wohlmuth

On the path to extreme scale computing, the hardware design must meet stringent requirements to keep the energy consumption of parallel computers at acceptable levels. This technological challenge is tackled by shrinking the electronic devices and reducing the voltage while simultaneously increasing the number of components. Recent studies indicate that such computer systems will become less reliable and some forecasts show that the mean time between failures could be lower than the time to recover from classical checkpoint, so that large calculations at scale might not make any progress if robust alternatives are not investigated.

The goal of this Dagstuhl Seminar was to bring together a diverse group of scientists with expertise in exascale computing to discuss novel ways to make applications resilient against detected and undetected faults. In particular, participants explored the role that algorithms and applications play in the holistic approach needed to tackle this challenge.

As a major result from the seminar, all of the participants contributed to the white paper provided in the full version of the report.

6.10 Tensor Computations: Applications and Optimization

Organizers: Paolo Bientinesi, David Ham, Furong Huang, Paul H. J. Kelly, Christian Lengauer, and Saday Sadayappan

Seminar No. 20111

Date: March 8–13, 2020 | Dagstuhl Seminar
Full report – DOI: 10.4230/DagRep.10.3.58

Participants: Peter Braam, Charisee Chiw, Jeremy Cohen, Anna Engels-Putzka, Jutho Haegeman, David Ham, Koby Hayashi, Paul H. J. Kelly, Christian Lengauer, Lawrence Mitchell, Norman Rink, Volker Tresp, Richard M. Veras, Frank Verstraete, Sophia Vorderwuelbecke

This seminar was planned for 40 participants, but due to travel restrictions resulting from Covid-19, only 15 were able to attend – though several key talks were delivered via teleconferencing. As a result, the Seminar was very focused, and very productive. Some aspects were lost, perhaps in particular representation in-person of the full breadth of applications communities.

It was very evident from the presentations and lively discussions at the Seminar that the field of "Tensor Computations" is vibrant, multi-faceted, interdisciplinary, and fundamental to progress in a diverse range of important areas which are driving researchers in different fields to search for common foundations and common tools.

One of the communities with an interest in tensor computations can be described as "classical" computational science, focusing, for example, on partial differential equations in fluid dynamics, and electronic structure computations in chemistry and materials science. Tensor contractions have been identified as a powerful way of representing the computational structure in the architecture of compilers for domain-specific languages serving these communities. Exploiting this algebraic intermediate representation in the compiler has enabled important performance optimizations far beyond the scope of conventional compilers based on loop nests and polyhedral techniques.

Another major community is primarily concerned with tensor decomposition – finding low-rank approximations of tensors. This is fundamental to data analytics and machine learning applications. Tensor factorization also provides a powerful framework for deep learning and representation learning, and provides a promising strategy for weight compression in convolutional neural networks.

Tensor contractions, in the form of tensor networks, have enormous importance as a tool for understanding and computation in particle and quantum physics. Indeed mapping the connections between these topics, as exposed through the structure of the tensor network representation, offers an exciting frontier with the potential to underpin these different disciplines with common language and shared software.

The seminar developed a focus, to some extent as a result of the participants able to attend, on tensor contractions, recognising that this provides a foundation for implementation of numerical methods for tensor decompositions. Revisiting this is a key topic to be addressed in following up this Seminar in the future.

A major focus for progress was identified in characterization of safety and correctness properties – ensuring that tensor contraction expressions are well-formed and meaningful. A related topic that was identified as critical concerns how structure is captured, represented and used. This is not only conceptually valuable, but provides a pathway to exploiting block, band and symmetry structure in generating efficient code.

An open question remains in how to capture, track and exploit the properties of tensors with unstructured (i.e. data-dependent) sparsity.

A key outcome from the Seminar was to recognize the massive replication of efforts in terms of software development. Many tools and libraries are being re-developed within different communities, while failing to share techniques and experience in high-performance implementation. The aim of this Seminar was to address this lack of cohesive, coherent community effort to develop computational building blocks. The results of this effort are being realized in the form of a "white paper", offering a manifesto for how to bridge the discipline divides and realize the potential for tensor computations in the future.

6.11 Beyond Adaptation: Understanding Distributional Changes

Organizers: Georg Krempl, Vera Hofer, Geoffrey Webb, and Eyke Hüllermeier

Seminar No. 20372

Date: September 6–11, 2020 | Dagstuhl Seminar
Full report – DOI: 10.4230/DagRep.10.4.1

Participants: Barbara Hammer, Claudia Kirch, Georg Krempl, Mykola Pechenizkiy, Sarah Schnackenberg, Myra Spiliopoulou, Dirk Tasche, Andreas Theissler
Remote Participants: Amir Abolfazli, Shai Ben-David, Antoine Cornuéjols, Sašo Džeroski, Johannes Fürnkranz, João Gama, Gerhard Gößler, Vera Hofer, Eyke Hüllermeier, Yun Sing Koh, Mark Last, Loong Kuan Lee, Pavlo Mozharovskyi, Eirini Ntoutsi, Arno Siebes, Jerzy Stefanowski, Ruth Urner, Geoffrey I. Webb, Indrė Žliobaitė

The world is dynamically changing and non-stationary. This is reflected by the variety of methods that have been developed to detect changes and adapt to them. These contributions originate from various communities, including statistics, machine learning, data mining, and the evolving and adaptive systems community. Nevertheless, most of this research views the changing environment as a black-box data generator, to which models are adapted (Fig. 6.4).

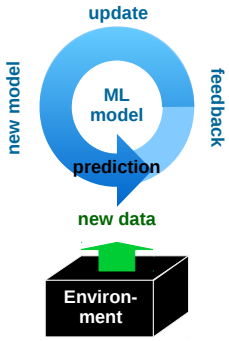


Fig. 6.4
Black-Box Model Adaptation.

The aim of this seminar was to put the focus on the distributional change itself, i.e., to make the process itself more transparent and a subject of research in its own right (Fig. 6.5). In its endeavour to understand causes, nature and consequences of distributional change, the seminar brought together researchers from communities in which related questions have already been studied, albeit in separate lines of research. These include *data stream mining*, *time series and sequence analysis*, *domain adaptation* and *transfer learning*, *subgroup discovery* and *emerging pattern mining*.

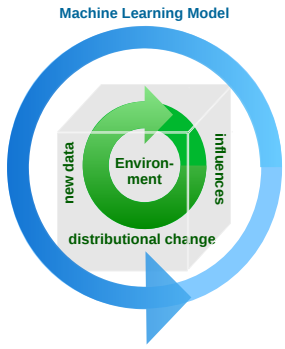


Fig. 6.5
Understanding Distributional Change.

Data stream mining studies data that arrives either one-by-one or in batches over time, and where the data generating process is often non-stationary. This requires computationally efficient approaches that are capable to detect and adapt to distributional changes. In this literature, the latter are commonly denoted as *concept drift*, *population drift*, or *shift*. Related to this seminar are in particular the problems of identifying change or irregularities in data streams, such as *outlier detection* [1], *anomaly detection* [2], *change detection* [3], *change diagnosis* [4], *change mining* [5], *drift mining* [6], and *drift understanding* [7].

Time series analysis studies data observed over a time course typically exhibiting some time dependencies. The correspondence of distributional change in this literature are *distributional structural breaks* or *change points*. Thus, of particular interest are the problems of *statistical change point analysis*, see e.g. the books by [8–10] or recent survey articles [12, 13]. A different line of research focuses on smallest detection delay for changes in sequentially observed data, see e.g. the recent books by [14, 15].

Of recent interest are also methods for the localization of multiple change points also known as *data segmentation* methodology, see e.g. the recent survey articles [16–20]. Of further interests is an *early classification of time series* [21].

Domain adaptation and **transfer learning** study the problem of transferring knowledge between domains or tasks. While there is not necessarily a temporal relationship between domains or tasks, distributional differences between domains are studied under the notion of *dataset shift*. Related problems of particular interest are *lifelong learning* [22] and *unsupervised domain adaptation* [23].

Subgroup discovery studies the problem of finding subgroups that show an unusual distribution for a target variable. There is not necessarily a temporal relationship between subgroup. Of particular interest is *exceptional model mining*, which studies the problem of finding subgroups, where a model fitted to that subgroup is somehow exceptional [24]. Another related area is *emerging pattern mining* [25] for identifying emerging trends in time-stamped databases.

Topics discussed in the seminar

The seminar identified several key research questions around understanding distributional changes:

1. Understanding the practical relevance of different scenarios and types of change.
2. How to model such types of change effectively.
3. How to detect, verify, and measure types of change.
4. How to effectively adapt prediction models to the different types of change.
5. How to establish bounds for distributional change, or for predictive performance under change.
6. How to visualise change, and how to highlight individual types of change.(interactively).
7. How to evaluate techniques for the above questions.

Due to the limited time, discussion has focused mostly on the first four research questions, with plans to address the remaining questions in a follow-up seminar.

Program overview

This one-week seminar was structured such that plenary sessions formed a frame around parallel break-out group sessions. It was opened with plenary sessions on Monday and Tuesday morning, where four tutorial served to establish a common vocabulary and understanding between the participants from the different communities. In the subsequent four half-days, 13 spotlight talks were organised, each followed by discussions in break-out groups, and each closing by a short bring-back plenary session. The seminar closed by two plenary sessions on Friday morning, where action plans for further steps on research and collaboration were discussed.

Outcomes

As detailed in the description of the sessions in the full version of the report, and in particular for the plenary session, differences in the terminology, concepts and common assumptions used in the different communities were identified as an important challenge towards common understanding of distributional changes. Therefore, a potential follow-up collaboration will focus on a joint publication that provides a mapping of terms and concepts. In particular, it should work out the notion of change (and representation) in data streams and time series, as well as in domain adaptation with multiple temporally connected source domains.

References

1 Shiblee Sadik and Le Gruenwald. Research issues in outlier detection for data streams. *ACM SIGKDD Explorations Newsletter*, 15(1):33–40, 2014.

2 Varun Chandola, Arindam Banerjee, and Vipin Kumar. Anomaly detection: A survey. *ACM computing surveys (CSUR)*, 41(3):15, 2009.

3 Dang-Hoan Tran, Mohamed Medhat Gaber, and Kai-Uwe Sattler. Change detection in streaming data in the era of big data: models and issues. *ACM SIGKDD Explorations Newsletter*, 16(1):30–38, 2014.

4 Charu C. Aggarwal. On change diagnosis in evolving data streams. *IEEE Transactions on Knowledge and Data Engineering*, 17(5):587–600, 2005.

5 Mirko Böttcher, Frank Höppner, and Myra Spiliopoulou. On exploiting the power of time in data mining. *ACM SIGKDD Explorations Newsletter*, 10(2):3–11, 2008.

6 Vera Hofer and Georg Krempl. Drift mining in data: A framework for addressing drift in classification. *Computational Statistics and Data Analysis*, 57(1):377–391, 2013.

7 Geoffrey Webb, Loong Kuan Lee, Bart Goethals, and Francois Petitjean. Analyzing concept drift and shift from sample data. *Data Mining and Knowledge Discovery*, 32(5):1179–1199, 2018.

8 Miklós Csörgö and Lajos Horváth. *Limit Theorems in Change-point Analysis*, volume 18. John Wiley & Sons Inc, 1997.

9 Jie Chen and Arjun K Gupta. *Parametric statistical change point analysis: with applications to genetics, medicine, and finance*. Springer Science & Business Media, 2nd edition, 2011.

10 B. E. Brodsky and B. S. Darkhovsky. *Nonparametric Methods in Change-point Problems*. Springer, 1993.

11 John AD Aston and Claudia Kirch. *Detecting and estimating changes in dependent functional data*. Journal of Multivariate Analysis, 109:204–220, 2012

12 Alexander Aue and Lajos Horváth. Structural breaks in time series. *Journal of Time Series Analysis*, 34:1–16, 2013.

13 Lajos Horváth and Gregory Rice. Extensions of some classical methods in change point analysis. *TEST*, 23:1–37, 2014.

14 Alexander Tartakovsky, Igor Nikiforov, and Michele Basseville. *Sequential analysis: Hypothesis testing and changepoint detection*. CRC Press, 2014.

15 Alexander Tartakovsky. *Sequential Change Detection and Hypothesis Testing: General Non-iid Stochastic Models and Asymptotically Optimal Rules*. CRC Press, 2019.

16 Idris A Eckley, Paul Fearnhead, and Rebecca Killick. Analysis of changepoint models. In David Barber, A. Taylan Cemgil, and Silvia Chiappa, editors, *Bayesian Time Series Models*, chapter 10, pages 205–224. Cambridge University Press, Cambridge, 2011.

17 Samaneh Aminikhanghahi and Diane J Cook. A survey of methods for time series change point detection. *Knowledge and Information Systems*, 51:339–367, 2017.

18 Haeran Cho and Claudia Kirch. Data segmentation algorithms: Univariate mean change and beyond. *arXiv preprint arXiv:2012.12814*, 2020.

19 Paul Fearnhead and Guillem Rigaill. Relating and comparing methods for detecting changes in mean. *Stat*, page e291, 2020.

20 Charles Truong, Laurent Oudre, and Nicolas Vayatis. Selective review of offline change point detection methods. *Signal Processing*, 167:107299, 2020.

21 Zhengzheng Xing, Jian Pei, and Eamonn Keogh. A brief survey on sequence classification. *ACM Sigkdd Explorations Newsletter*, 12(1):40–48, 2010.

22 Anastasia Pentina and Ruth Urner. Lifelong learning with weighted majority votes. In *Neural Information Processing Systems*, volume 29, pages 3619–3627, 2016.

23 Shai Ben-David and Ruth Urner. On the hardness of domain adaptation and the utility of unlabeled target samples. In *International Conference on Algorithmic Learning Theory*, pages 139–153, 10 2012.

24 Wouter Duivesteijn and Julia Thaele. Understanding where your classifier does (not) work. In Albert Bifet, Michael May, Bianca Zadrozny, Ricard Gavalda, Dino Pedreschi, Francesco Bonchi, Jaime Cardoso, and Myra Spiliopoulou, editors, *Machine Learning and Knowledge Discovery in Databases*, pages 250–253, Cham, 2015. Springer International Publishing.

25 Petra Kralj Novak, Nada Lavrač, and Geoffrey I Webb. Supervised descriptive rule discovery: A unifying survey of contrast set, emerging pattern and subgroup mining. *Journal of Machine Learning Research*, 10(2), 2009.

6

6.12 Interactive Visualization for Fostering Trust in AI

Organizers: Daniela Oelke, Daniel Keim, Polo Chau, and Alex Endert

Seminar No. 20382

Date: September 13–16, 2020 | Dagstuhl Seminar
Full report – DOI: 10.4230/DagRep.10.4.37

Participants: Michael Behrisch, Rita Borgo, Mennatallah El-Assady, Daniel A. Keim, Jörn Kohlhammer, Daniela Oelke, Maria Riveiro, Tobias Schreck, Jarke J. van Wijk

Artificial Intelligence (AI) and other computational processes continue to influence decisions across a wide range of applications including healthcare decisions, vehicle navigation, data science, and others. This Dagstuhl Seminar reflected on some of the challenges inherent in the goal of increasing the interpretability of these systems, and when applicable, increase the trust people put into them to make decisions. The seminar participants discussed the complexity of trust itself, and how the concept is multi-faceted, and likely outside of researchers in technology and computer science to fully define. We discussed an inter-disciplinary research agenda, as well as a manifesto that should help frame this direction going forward.

6.13 Decision-Making Modeling and Solutions for Smart Semiconductor Manufacturing

Organizers: Chen-Fu Chien, Hans Ehm, John W. Fowler, and Lars Mönch

Seminar No. 20452

Date: November 1–5, 2020 | Dagstuhl Seminar
Full report – DOI: 10.4230/DagRep.10.5.1

Participants: Chen-Fu Chien, Hans Ehm, John Fowler, Raphael Herding, Abddelgafar Ismail, Steffen Kalisch, Leon McGinnis, Lars Mönch, Niklas Petersen, Sven Spieckermann, Nour Ramzy, Marco Ratusny, Tobias Völker

Introduction

The Industry 4.0 vision is a frequently discussed topic in manufacturing enterprises in Europe, Asia, and North America. It is expected that advanced technologies such as Cyber-Physical Systems (CPS), Internet of Things (IoT), cloud computing, artificial intelligence, machine learning, and big data technologies enable the emergence of smart manufacturing systems. A smart factory promises to bring transparency to manufacturing facilities by integrating technological advances in computer networks, data integration, and analytics [13]. At the same time, critical questions are asked related to the benefits of Industry 4.0 ([14], [17], [15]). It is mainly criticized that the requirements and consequences of Industry 4.0 regarding future production planning and control strategies are not fully understood or not even taken into account in the overall Industry 4.0 conception, i.e., many of key decision processes are not included [14].

The semiconductor industry is capital intensive with the cost of an entire wafer fab up to nearly $10 billion US. The high cost is primarily due to extremely expensive machines, some cost up to $100 million US each. The manufacturing process is very complex due to reentrant flows in combination with very long cycle times and multiple sources of uncertainty [16]. Capacity expansions are expensive and time-consuming. The semiconductor industry is an extreme field for production planning and control solutions from an algorithmic and also from a software and information systems point of view. At the same time, the degree of automation has always been and continues to be high compared to other industries [1]. On the one hand, one can argue that some elements of smart manufacturing are already realized in wafer fabs, namely:

- most manufacturing information is available in real-time
- the manufacturing process is paperless
- lots can be uniquely identified and located
- collaborative human-machine interactions exist.

On the other hand, there are significant differences from automation efforts in manual work-intensive industries such as automotive or aircraft manufacturing where assembly operations are performed in flow lines. In addition to shop-floor control concerns, supply chain management (SCM) problems have become more and more important in the last decade in the semiconductor industry which necessitate horizontal integration of the semiconductor supply chain.

The literature with respect to an adoption of Industry 4.0 principles for semiconductor manufacturing is small and mainly on a survey or conceptual level ([6], [4], [9], [3], [10, 11]). Concrete answers towards future production planning and control strategies that exploit the new possibilities of CPSs and big data approaches to address complicated decisions involved in semiconductor supply chains are only very initially given in the literature.

The major objective of the seminar was related to developing a research agenda for making smart semiconductor manufacturing decisions and the information systems to empower flexible decisions for smart production. This includes innovative modeling approaches for supply chain planning and more detailed production planning and scheduling in semiconductor manufacturing and an analysis of requirements for next-generation information systems that support such decisions. One of the expected outcomes of the seminar consisted of developing a significant draft of a concept for a simulation testbed which allows for assessing smart planning and control decisions in the semiconductor industry.

Thus, the purpose of this seminar was to bring together researchers from different disciplines including information systems, computer science, industrial engineering, supply chain management, and operations research whose central interest is in decision-making for smart semiconductor manufacturing. Practitioners from the semiconductor industry who have frequently articulated their perception that academic research does not always address the real problems faced by the industry brought in their domain knowledge to make sure that progress towards appli-

cability and feasibility would be made during the seminar. Due to the Covid 19 pandemic, the seminar had only nine attendees from Germany who physically attended at Dagstuhl. Moreover, four online talks were given by participants from US, Taiwan, and Germany. We had participants from the leading semiconductor companies Infineon Technologies and Globalfoundries.

A primary purpose of the seminar was to extend the scope of the academic research community from conventional decision-making for single wafer fabs to making smart semiconductor manufacturing decisions for entire semiconductor supply chains. The principle architecture of the planning and control system of a conventional semiconductor supply chain is shown in Figure 6.6.

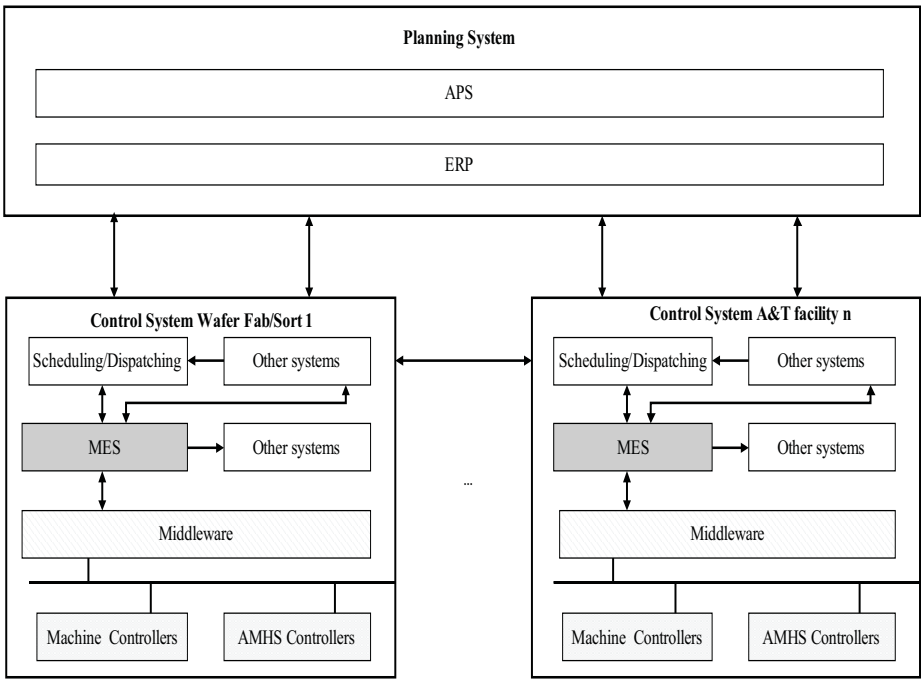


Fig. 6.6
Planning and Control System of a Semiconductor Supply Chain (adapted from [16]).

Seminar Objectives

The primary objective of the proposed seminar was to develop a research agenda for decision-making in smart semiconductor manufacturing. This included innovative modeling approaches for supply chain planning and detailed production planning and scheduling/dispatching in semiconductor supply chains. But it also included ideas on how to design the related future information systems.

The research agenda was developed around the following two main topics:

- **Topic 1: Novel decision-making approaches that exploit the huge amount of available data and orchestrate the interrelated decisions:**
  - It is required to develop a better understanding of which parts of the Industry 4.0 vision are already implemented in semiconductor manufacturing and what is still missing.
  - The specific automation drivers in semiconductor manufacturing compared to other industries must be identified.
  - The usage of additional data which, for instance, is provided by sensors and cyber-physical systems has to be explored to make better decisions [2]. The improvement potential based on the advanced data availability must be quantified [10].
  - Research is necessary to determine which decisions can or even should be integrated. Possible examples for integrated short-term decisions are job scheduling on machines and automated transportation and job scheduling and preventative maintenance planning. Integrated scheduling and process control decisions are another example. On the mid-term planning level, the integrated management of production jobs and engineering jobs is challenging. Up to 30% of all jobs in a wafer fab are engineering jobs. They compete with the production jobs for the scarce capacity of the machines. It is also interesting to make integrated production planning and inventory planning decisions in semiconductor manufacturing.
  - We are interested in which changes are required (or even possible) for planning and control algorithms in smart manufacturing systems. It has to be discussed whether we expect fundamentally new algorithms or not.
  - We are also interested in exploring the need for new fab layouts in the context of smart manufacturing. Initial steps towards the possible redesign of the automated material handling system (AMHS) are discussed by Ham and Kim [7] and Hwang and Jang [8].
  - Dynamics and stochasticity have to be included into decision-making. Different modeling techniques that attempt to reduce the effects of stochasticity include robust optimization, approximate dynamic programming, and stochastic programming and these techniques need to be researched in the smart semiconductor manufacturing context. Different approaches to appropriately deal with stochasticity include rolling planning techniques and inventory holding strategies and these also need to be

studied. Generation of scenarios and other distribution parameters for planning problems in supply chains using big data techniques have to be investigated.
- Many planning and control approaches are based on (distributed) hierarchical approaches. The role of anticipation of lower level behavior in upper level decision-making is still not well understood and has to be studied in more detail. Because many different, often autonomous decision-making entities including humans occur in semiconductor manufacturing, negotiation approaches are typical in such distributed hierarchical planning and control systems. Research is needed to investigate how such negotiation approaches can be automated and which decisions should continue to be made by humans.
- It has to be explored how to incorporate sustainability issues into decision making. For instance, taking advantage of real-time pricing in future energy markets is only reasonable when scheduling decisions can be made in real-time.
- The relationship of real-time decisions based on real-time information on the status of the shop-floor (or even the supply chain) and planning nervousness has to be studied.
- As the level of automation increases in the factory of the future, there is a need to adapt the decision-making entities to the current situation on the shop floor and at the entire supply chain level. Different machine learning paradigms have to be investigated for this purpose.

- **Topic 2: Future information systems for decision support and facilitating digital transformation:**
  - The required changes for next-generation decision support systems have to be investigated. It is expected that decentralized decision support systems are more important than in the past.
  - Alternative software solutions including software agents and service-oriented computing for planning and scheduling applications in smart semiconductor manufacturing have to be proposed.
  - Alternative software solutions including software agents and service-oriented computing for planning and scheduling applications in smart semiconductor manufacturing have to be proposed
  - We have to study role of different simulation paradigms in the factory of the future/supply chain of the future.
  - The benefit of digital twins in semiconductor manufacturing has to be explored. For instance, it has to be decided at what levels (e.g. factory, supply chain) they should be considered.
  - Integration concepts for state-of-the-art computing techniques to get models that are computationally tractable and address the different uncertainties encountered in this industry have to be investigated for their usage in smart semiconductor manufacturing.
  - Getting a better understanding the interaction of human agents with information systems in the factory of the future is required.
  - Because of the complexity of semiconductor supply chains, long computing times still hinder the usage of analytic solution approaches especially for what-if analysis. The role of state-of-the-art computing techniques including parallel computing on Graphics Processing Units (GPU) machines or cloud computing techniques in decision-making for smart semiconductor manufacturing needs to be investigated.

Since the expected potential of smart manufacturing is based on advanced information and communication technologies, we think that the second topic is important and should be also addressed in the research agenda. Research related only to the first main topic is not sufficient.

Due to the inherent complexity of semiconductor supply chains, simulation of the physical supply chain is required to: a) understand the interactions between the planning and control components and the physical supply chain, b) find solution approaches to problems, and c) verify the solution approaches in the risk-free simulation environment before implementing them. Existing models do not reflect the complexity and the level of detail of current and future semiconductor supply chains. Therefore, the secondary objective of the seminar consisted in identifying the core elements of a simulation testbed which allows for assessing smart planning and control decisions in the semiconductor industry.

The Process

In the opening session, the organizers welcomed the participants. Next, the participants each introduced themselves. This was followed by an overview of the goals and objectives of the seminar and a detailed review of the seminar program including the ground rules for interactions.

The remainder of the day on Monday consisted of a keynote talk by Chen-Fu Chien and two industry overview talks (by Hans Ehm and by Steffen Kalisch). Another keynote talk was given by Leon McGinnis on Monday afternoon. The rest of Monday afternoon, Tuesday, and half a day on Wednesday were devoted to presentations and discussions about the various elements of smart decision-making in semiconductor supply chain planning and control systems as shown in Figure 1 above. There was another keynote talk delived by John Fowler on simulation modeling to reduce the impact of COVID-19. See Table 6.1 for a list of topics and presenters and Section 3 for abstracts of the presentations.

Wednesday afternoon was the hiking excursion that was enjoyed by the participants.

Tuesday afternoon was devoted to one breakout session with report outs on the topics in Table 6.2. Section 4 has the breakout report outs. The first set of breakout sessions had two groups focus on smart planning and control decisions. The second set of breakouts on Wednesday morning again had two groups that discuss requirements for performance assessment of smart planning and control decisions in semiconductor supply chains.

Thursday consisted of a discussion on the required core elements of a simulation testbed for assessing smart semiconductor and supply chain planning and control decisions and a wrap-up session.

Table 6.1
Individual Presentations.

Topic	Presenter
Smart manufacturing	Chen-Fu Chien (virtual)
Industry overview	Hans Ehm
Challenges for smart manufacturing in wafer fabs	Steffen Kalisch (virtual)
Reference modeling and smart manufacturing	Leon McGinnis (virtual)
Semantic data integration for supply chain management	Nour Ramzy
Visualization and interpretation of customer order behaviors	Marco Ratusny
in semiconductor supply chains with machine learning approaches	
Ontology-based information modeling in the industrial data space	Niklas Petersen
Modeling and simulation for the pandemic, the bullwhip effect	Abddelgafar Ismail
and sustainability	
How simulation modeling can help reduce the impact of COVID-19	John Fowler (virtual)
S2CMAS: an agent-based system for planning in	Raphael Herding
semiconductor supply chains	
Sustainability in smart manufacturing	Lars Mönch
Data-driven production planning	Tobias Völker
Digital twin and simulation	Sven Spieckermann

Table 6.2
Breakout Sessions.

Session	Topic	Participants (lead in italic)
1	Smart Planning in Semiconductor	Hans Ehm, *Niklas Petersen*,
	Supply Chain Management	Marco Ratusny, Tobias Völker
	Smart Manufacturing Control Decisions	*Raphael Herding*, Lars Mönch,
		Sven Spickermann
2	Smart Planning in Semiconductor	Hans Ehm, *Niklas Petersen*,
	Supply Chain Management	Marco Ratusny, Tobias Völker
	Requirements for Performance Assessment	*Raphael Herding*, Lars Mönch,
	of Smart Manufacturing Control Decisions	Sven Spickermann

Key Take Aways

There were a number of key findings and areas for future research that were identified in the seminar. We will first summarize some of the key findings and will follow this with some areas for future research.

One of the first findings was that the participants generally agreed that the term smart manufacturing is somehow fuzzy. While the different elements in Figure 6.6 are reasonably well understood by both the industrial and academic communities with respect to smart decision-making, the interactions between the elements are less well understood. Second, the participants generally agree that the integration of the decisions made by the different elements is often fairly ad hoc and could/should be improved. Finally, the participants generally agreed that there are new requirements for an adequate reference model for smart manufacturing in semiconductor supply chains. Although there are reasonable data sets available on the factory (i.e., the SMT2020 dataset, cf. [12]) and supply chain level (cf. [5]) no data sets exist yet that take the specifics of smart manufacturing into account.

In addition to the findings mentioned above, several areas for future research were identified. An overarching idea was that the future research should focus more on using artificial intelligence tools in smart manufacturing for semiconductor supply chains. Some of the future research areas are included below:

- Using ontologies, for instance the digital reference, for planning and control purposes.
- Developing better integration of various smart decisions made in the elements of Figure 6.6.
- Incorporating sustainability aspects into wafer fab and supply chain models.
- Extend existing performance assessment schemes for smart manufacturing, for instance by considering renewable energy sources such as the sun and wind.
- Extend existing simulation-based performance assessment

schemes in the sense that machine learning-based planning and control schemes can be benchmarked. This requires adaptive behavior of the planning and control schemes.

Next Steps

The organizers plan to repeat the seminar after the end of the Covid 19 pandemic since several objectives of the seminar were not reached due to the limited number of participating attendees. This is especially true for the development of the research agenda for smart decisions in semiconductor manufacturing and for the simulation testbed which allows for assessing smart planning and control decisions in the semiconductor industry.

Acknowledgements

The seminar organizers would like to thank the Dagstuhl team for the provided support and the flexibility which was required due to the Covid 19 situation. The seminar also would not have been nearly as productive without the active contribution of every physical or virtual attendee, and for that the organizers are extremely grateful.

References

1 Chien, C.-F., Dauzére-Pèrés, S., Ehm, H., Fowler, J. W., Jiang, Z., Krishnaswamy, S., Lee, T.-E., Mönch, L., Uzsoy, R. 2011. Modeling and Analysis of Semiconductor Manufacturing in a Shrinking World: Challenges and Successes. *European Journal of Industrial Engineering*, 5(3), 254-271.

2 Chien, C.-F, Chuang, S.-C. 2014. A Framework for Root Cause Detection of Sub-Batch Processing System for Semiconductor Manufacturing Big Data Analytics. *IEEE Transactions on Semiconductor Manufacturing*, 27(4), 475-488.

3 Dequeant, D., Vialletelle, P., Lemaire, P., Espinouse, M.-L. 2016. A Literature Review on Variability in Semiconductor Manufacturing: The Next Forward Leap to Industry 4.0. *Proceedings of the 2016 Winter Simulation Conference*, 2598-2609.

4 Ehm, H., Mönch, L. 2016. Von der Digitalen Fabrik zur Digitalen Lieferkette in der Halbleiterindustrie: Bestandsaufnahme, Lösungsansätze und viele Herausforderungen. Obermaier, R. (ed.) *Industrie 4.0 als unternehmerische Gestaltungsaufgabe*, Springer/ Gabler, 149-158.

5 Ewen, H., Mönch, L., Ehm, H., Ponsignon, T., Fowler, J. W., Forstner, L. 2017. A Testbed for Simulating Semiconductor Supply Chains. *IEEE Transactions on Semiconductor Manufacturing*, 30(3), 293-305.

6 Forstner, L., Dümmler, M. 2014. Integrierte Wertschöpfungsnetzwerke – Chancen und Potenziale durch Industrie 4.0. *Elektrotechnik und Informationstechnik*, 131(7), 199-201.

7 Ham, A., Kim, D. J. 2017. Scheduling of Drone-based Material Transfer System in Semiconductor Manufacturing. *Proceedings of the 2017 Winter Simulation Conference*, 3726-3732.

8 Hwang, I., Jang, Y. J. 2020. Q(λ) Learning-based Dynamic Route Guidance Algorithm for Overhead Hoist Transport systems in Semiconductor Fabs. *International Journal of Production Research*, 58(4), 1199-1221.

9 Kaufmann, T., Forstner, L. 2017. Die horizontale Integration der Wertschöpfungskette in der Halbleiterindustrie – Chancen und Herausforderungen. T. Bauernhansl, M. ten Hompel, B. Vogel-Heuser (eds.) *Industrie 4.0 in Produktion, Automatisierung und Logistik*, Wiesbaden, 359-367.

10 Khakifirooz, M., Fathi, M., Wu, K. 2019a. Development of Smart Semiconductor Manufacturing: Operations Research and Data Science Perspectives, *IEEE Access*, 7.

11 Khakifirooz, M., Fathi, M., Chien, C.-F., Pardalos, P. M. 2019b. Management Suggestions for Process Control of Semiconductor Manufacturing: An Operations Research and Data Science Perspective. Blondin, M. J., Pardalos, P. M., Sáez, J. S. (eds.) *Computational Intelligence and Optimization Methods for Control Engineering*, Springer, 245-274.

12 Kopp, D., Hassoun, M., Kalir, A., Mönch, L. 2020. SMT2020 – A Semiconductor Manufacturing Testbed. *IEEE Transactions on Semiconductor Manufacturung*, 33(4), 522 – 531.

13 Lee, J. 2015. Smart Factory Systems. *Informatik-Spektrum*, 38(3), 230-235.

14 Mertens, P. 2014. Industrie 4.0 = CIM 2.0? *Industrie Management*, 30(1), 27-30.

15 Mertens, P., Barbian, D. 2019. Industrie 4.0 und Integrierte Informationsverarbeitung. Obermaier, R. (ed.) *Handbuch Industrie 4.0 und Digitale Transformation*, Springer/Gabler, 47-71.

16 Mönch, L., Fowler, J. W., Mason, S. J. 2013. *Production Planning and Control for Semiconductor Wafer Fabrication Facilities*. New York: Springer.

17 Sucky, E., Gampl, M., Ruh, A., Stelzer, N., Weidinger, J. 2018. Industrie 4.0: Marketingkampagne oder Revolutionsbeginn? https://opus4.kobv.de/opus4-bamberg/frontdoor/index/index/docId/46573.

7 Öffentlichkeitsarbeit
Public Relations and Outreach

7.1 Pressemitteilungen und Medienarbeit

7.1 *Press Releases and Media Work*

Die regelmäßige Erstellung und Herausgabe von Pressemitteilungen dient der verständlichen Verbreitung von aktuellen Informatikthemen. Die Vermittlung des Konzepts von Schloss Dagstuhl ist dabei ebenfalls ein Thema. Pressemitteilungen und Berichterstattungen in diversen Medien – soweit bekannt – sind über das Internetportal von Schloss Dagstuhl[35] abrufbar.

Schloss Dagstuhl hat sich zur allgemeinen Anlaufstelle für Journalisten etabliert, die über bestimmte Informatikthemen, aber auch über Schloss Dagstuhl berichten möchten. Durch Unterstützung des Saarländischen Rundfunks steht Schloss Dagstuhl ein professionelles Reporterset zur Verfügung, welches Rundfunkjournalisten erlaubt, vor Ort mit Seminarteilnehmern Interviews in digitaler, verlustfreier Audioqualität zu führen.

Schloss Dagstuhl verbreitet Neuigkeiten rund um sein Programm auch über soziale Netzwerkdienste wie Twitter und LinkedIn. Über Twitter-Nutzer @dagstuhl werden Programmankündigungen, die Publikation von neuen Tagungsbänden aber auch andere relevante Neuigkeiten an aktuell ca. 2 630 Abonnenten verbreitet. Zunehmend nutzen aber auch Seminarteilnehmer den Dienst, um ihre Eindrücke vom Seminar mitzuteilen. Darüber hinaus werden über den Twitter-Nutzer @dblp_org Informationen über die Bibliographiedatenbank dblp an ca. 1 500 Abonnenten verbreitet. Bei LinkedIn wird eine eigene Gruppe „Friends of Schloss Dagstuhl“ gepflegt (derzeit über 620 Mitglieder), mit dem Ziel, die Vernetzung der Teilnehmer von Dagstuhl-Seminaren zu unterstützen. Weiterhin werden dort interessante Neuigkeiten rund um Schloss Dagstuhl bekannt gegeben.

Regular press releases showcase and disseminate information about current computer science topics in a comprehensible manner and clarify the concept behind Schloss Dagstuhl. Press releases and media reports that come to the center's attention are available on the Schloss Dagstuhl website[35].

Schloss Dagstuhl has become a port of call for journalists seeking to report on specific computer science topics and/or on Schloss Dagstuhl itself. Thanks to the support of the Saarländischer Rundfunk, Schloss Dagstuhl has access to professional reporting equipment that enables broadcast journalists to conduct interviews with seminar participants in digital lossless audio quality.

News on the program of Schloss Dagstuhl are also disseminated via social networks such as Twitter and LinkedIn. The Twitter handle @dagstuhl is used to disseminate program announcements, publication announcements, and other relevant news to about 2,630 followers, but is also increasingly used by Dagstuhl Seminar participants to share their impressions. Additionally, information about the dblp computer science bibliography is sent using the Twitter account @dblp_org, having about 1,500 followers. At LinkedIn, a “Friends of Schloss Dagstuhl” group is maintained (with more than 620 members), which supports the networking of participants in Dagstuhl Seminars. Additionally, interesting news about Schloss Dagstuhl are announced there.

[35] https://www.dagstuhl.de/about-dagstuhl/press/

8 Einrichtungen
Facilities

Das Zentrum verfügt über drei Standorte; der Hauptstandort ist Schloss Dagstuhl in Wadern. Die Geschäftsstelle mit Sachbearbeitungsteam und wissenschaftlichen Mitarbeitern, die für die Dagstuhl-Seminare und Perspektiven-Workshops verantwortlich sind, befinden sich auf dem Campus der Universität des Saarlandes in Saarbrücken, während der Bibliographiedienst durch wissenschaftliche Mitarbeiter in Räumlichkeiten der Universität Trier betreut wird. Der Dagstuhl-Verlagsdienst befindet sich in Saarbrücken und Wadern.

The institution operates from three sites: the main site is Schloss Dagstuhl in Wadern. The administrative office and the scientific staff operating the Dagstuhl Seminars and Perspectives Workshops are located on the campus of Saarland University in Saarbrücken, while the scientific staff operating the Bibliographic Services are located in offices on the campus of the University of Trier. Dagstuhl Publishing is located in Saarbrücken and Wadern.

Hauptstandort in Wadern 8.1 *Main Site in Wadern*

Der Hauptstandort in Wadern umfasst das historische Schloss (gebaut um 1760) mit einem Anbau aus den 1970ern, einem 1993 fertiggestellten Erweiterungsbau, in dem sich Forschungsbibliothek, Hörsäle, Gästezimmer, Büros und Infrastruktur befinden, und ein 2012 fertiggestelltes Gästehaus mit Gästezimmern, einem Konferenzraum und Räumlichkeiten der Gebäudeverwaltung. Alle Einrichtungen in Wadern sind ganzjährig in Betrieb, abgesehen von je zwei Wochen im Sommer und Winter, die für größere Instandhaltungsarbeiten genutzt werden.

Die Kapazitäten von Dienstleistungen und Räumlichkeiten zur Veranstaltung von Seminaren sind genau aufeinander abgestimmt: Das Zentrum hat 71 Gästezimmer, davon sind 18 Doppelzimmer, sodass insgesamt 89 Teilnehmer übernachten können. Bei Normalbetrieb finden parallel zwei Seminare mit jeweils 30 und 45 Teilnehmern statt, wobei jedem Seminar ein Hörsaal für 35 bzw. 60 Personen zur Verfügung steht. Obwohl so eine Gesamtsumme von 75 Teilnehmern entsteht, ist es nur selten notwendig, Seminargäste in Doppelzimmern oder einem nahegelegenen Hotel unterzubringen. Die Obergrenze von 71 Zimmern wird regelmäßig erreicht, weshalb es wohl kaum Möglichkeiten gibt, die Nutzung unserer Einrichtungen weiter auszubauen.

The main site in Wadern comprises the historic manor house (built around 1760) with an extension from the 1970s, a facility completed in 1993, which is housing a research library, lecture halls, guest rooms, offices and infrastructure, and a guest house completed in 2012 with guest rooms, a conference room, and garages for facility management. All facilities at Wadern are operated all year round except for two weeks each in summer and winter when larger maintenance tasks are scheduled.

The capacities of services and facilities for hosting seminars at the main site are well coordinated: the site has 71 rooms, including 18 double rooms, for a total capacity of 89 participants staying overnight. During routine operation two seminars with nominally 30 and 45 participants are hosted in parallel, each using a lecture hall with 35 and 60 seats, respectively. Even though this sums up to 75 seminar participants, it is rarely necessary to book seminar guests into double rooms or a nearby hotel. The maximum capacity of 71 rooms is reached regularly and hence there is hardly a way to increase utilization of facilities further.

Tagungsräume

Schloss Dagstuhl bietet drei Hörsäle für jeweils 25 bis 60 Personen. Alle Hörsäle sind mit einem Beamer, einem MS-Windows-Laptop und einer Audioanlage einschließlich Mikrophonen ausgestattet. Durch diese Technik werden Vorträge, Präsentationen und Live-Vorführungen optimal unterstützt. Mittels eines Presenters können Vortragende ihre vorbereiteten Materialien präsentieren, ohne zum Laptop oder Arbeitsplatz zurückkehren zu müssen.

Neben den Hörsälen gibt es im Zentrum sechs Seminarräume. Davon sind zwei mit modernen Beamern ausgestattet, während in einem ein großes Plasmadisplay montiert ist. Fünf Beamer auf Rollwagen stehen zusätzlich zur flexiblen Benutzung in allen Räumen zur Verfügung.

Alle Hörsäle und andere Tagungsräume sind mit Tafeln und/oder Whiteboards augestattet.

Daneben gibt es über das ganze Zentrum verteilt weitere Räume, in denen Gäste sich in entspannter Atmosphäre treffen und diskutieren können. Insbesondere am Abend

Conference Facilities

Schloss Dagstuhl has three lecture halls with a seating capacity of 25 to 60 each. All lecture halls are equipped with a projector, an MS-Windows notebook, and an audio system including a microphone. These facilities not only enable talks and papers to be presented in an optimal manner but also permit online demonstrations to be given to large audiences. A presenter is available for those who wish to go through their presentations without physical access to a computer.

In addition to the lecture halls, the center has six meeting rooms. Two are equipped with up-to-date projectors and one has a large plasma display on the wall. Five mobile projectors are available for use in all of the rooms.

All lecture halls and meeting rooms are equipped with blackboards and/or whiteboards.

The center also offers a variety of other spaces where guests can sit and work together in a relaxed atmosphere. Particularly in the evening, guests gravitate towards the

zieht es viele Gäste in den Weinkeller und die Cafeteria, zwei der gemütlichsten Räume im Haus und hervorragend geeignet für die Fortsetzung einer produktiven Diskussion in angenehmer Atmosphäre.

Dagstuhls Küche

Die Mahlzeiten sind ein wichtiger Bestandteil des wissenschaftlichen Programms von Schloss Dagstuhl. Die Sitzordnung wird absichtlich stets zufällig gemischt, um eingefahrene Gruppen aufzuteilen und Gäste zu ermuntern, während ihres Aufenthalts möglichst viele verschiedene Kollegen kennenzulernen. Große Tische im Speiseraum fördern die gemeinschaftliche Interaktion bei den Mahlzeiten.

Dagstuhls Philosophie des Kochens ist einfach: saisonal, gesund und schmackhaft. Unsere Gerichte werden jeden Tag von unseren Mitarbeitern der Küche frisch zubereitet. Der Schwerpunkt liegt dabei auf leichtem Essen während des Tages, um unsere Gäste nicht zu ermüden, und auf warmen Gerichten am Abend. Dies steht ein wenig im Widerspruch zur deutschen Tradition, kommt aber der Mehrheit der internationalen Gäste des Zentrums durchaus entgegen.

Sowohl die Zutaten als auch die Gerichte wechseln saisonal. An warmen Sommerabenden wird auf Anfrage auf der Terrasse vor dem Speisesaal gegrillt, unter anderem saarländische Schwenker, eine lokale Variante des Grillsteaks, die unter dauerndem Schwenken des Grillrostes zubereitet wird. In den kalten Monaten steht einmal wöchentlich ein schmackhafter Eintopf auf dem Speiseplan. Über das Jahr hinweg wird eine ausgewogene Mischung an regionalen und internationalen Spezialitäten aus neuen sowie bewährten und beliebten Rezepten angeboten. Im Allgemeinen sind die angebotenen Gerichte im Sommer etwas leichter und im Winter ein wenig schwerer. Die Küche arbeitet nach dem HACCP-Konzept (Hazard Analysis and Critical Points Concept) und hält sich an die Kennzeichnungspflicht von Allergenen, zu der alle lebensmittelverarbeitenden Betriebe verpflichtet sind. Des Weiteren achten wir auf deklarationsfreie Zusatz- und Konservierungsstoffe.

Alle Gäste, die aus medizinischen oder ethischen Gründen Einschränkungen bei der Speiseauswahl haben, können sich vor dem Seminar bei Schloss Dagstuhl melden. Unsere Küchenmitarbeiter erarbeiten gerne individuelle Lösungen für jeden Gast, soweit es irgend möglich ist. Gäste, die koscheres Essen benötigen, haben die Möglichkeit, mitgebrachte abgepackte Speisen selbst zu erhitzen.

Um unseren Gästen trotz eines begrenzten Budgets eine ausgewogene Qualität anbieten zu können, bietet unsere Küche ein Frühstücksbüffet, dienstags bis donnerstags abhängig von den personellen Kapazitäten ein Mittagsbuffet sowie ein Menü am Abend an. Montags und freitags wird aus logistischen Gründen auch am Mittag ein Menü serviert. Unser Restaurant mit den großen Fenstern zum Garten des Hauptgebäudes bietet ca. 80 Personen Platz. Hier herrscht eine entspannte und fast familiäre Atmosphäre, was nicht zuletzt auf unsere freundlichen und engagierten Mitarbeiter zurückzuführen ist.

wine cellar and upstairs café, two of the coziest places in the house and great places for continuing a productive discussion in a comfortable atmosphere.

Dagstuhl's Kitchen

The dining experience at Dagstuhl is an important part of the center's scientific program. Seating arrangements are mixed deliberately in order to break up cliques and encourage guests to talk to as many different people as possible during the course of their stay. Large tables in the dining hall promote collaborative interaction during meals.

The philosophy behind Dagstuhl's cooking is simple: seasonal, healthy, and tasty meals. Everything is freshly prepared each day by the kitchen's staff. The focus is on lighter fare during the day in order to aid scientists' concentration, and on a warm meal in the evening, breaking with the German tradition of a cold evening meal while matching the internationality of the center's guests.

Both ingredients and dishes vary with the seasons. On warm summer evenings, guests are invited on demand to partake of grilled *Schwenker* (the local variant of barbecued steak) on the outdoor patio adjacent to the dining hall. During the cold winter months, warm soups appear on the menu weekly. In general, the kitchen tries to keep meals lighter in the summertime and heavier in the winter, offering a blend of regional and international dishes year-round that include some new recipes and many tried-and-true Dagstuhl favorites. The kitchen works in accordance with the HACCP Concept (Hazard Analysis and Critical Points Concept) and adheres to the mandatory labeling of allergens, which is required of all food processing establishments. Food additives and conservatives for which labeling is non-mandatory are also carefully monitored.

All guests with special dietary requirements due to ethical or health reasons can announce their needs previous to the events. Our kitchen staff will then work out individual solutions if at all possible. Guests who need kosher meals can heat up ready-to-eat meals for themselves.

To accomplish all of this within a reasonable budget, the center offers a buffet-style breakfast and a set evening meal served by the kitchen's friendly and dedicated staff. From Tuesday to Thursday the kitchen offers a buffet-style lunch depending on the staff capacities. Due to logistical reasons, a set meal is served at lunch on Mondays and Fridays. The large dining-hall, seating up to 80 persons, opens onto the castle garden and patio, and offers a relaxed, familiar atmosphere.

Small and late-morning breaks punctuate the daily routine. During the small coffee break in the morning, hot drinks are served outside the lecture halls. During the longer coffee break in the afternoon, hot drinks together with freshly baked cake are served in the dining hall. In addition, there are self-service bean-to-cup coffee machines in the guest house, at the "old" café, and in the wine cellar. Guests can buy small snacks at the kiosk in front of the café. Bread and cheese is served in the café and the wine cellar every night.

Kleine und große Pausen unterbrechen auf angenehme Weise die tägliche Routine und anstrengenden Diskussionen. In der kleinen Kaffeepause am Vormittag stehen vor den Vortragsräumen heiße Getränke auf einem Kaffeewagen bereit. In der großen Kaffeepause am Nachmittag wird den Gästen im Speiseraum neben heißen Getränken auch frisch gebackener Kuchen angeboten. Darüber hinaus gibt es im Gästehaus, der „alten“ Cafeteria und dem Weinkeller jeweils einen Kaffeevollautomaten zur Zubereitung von Kaffee, Kakao und Tee. Im Kiosk vor der Cafeteria können Gäste Snacks erwerben. Abends gibt es in der Cafeteria und im sogenannten Weinkeller einen Gruß aus der Küche, bestehend aus Brot und einer Käseauswahl.

Kinderbetreuung

Schloss Dagstuhl bietet Teilnehmern, die mit Kindern anreisen, ein qualifiziertes Betreuungsprogramm für Kinder an. Dieser Service kann gegen ein geringes Entgelt im Voraus gebucht werden. Alternativ ist es Eltern auch möglich, eine Begleitperson zur Betreuung des Kindes oder der Kinder mitzubringen. Schloss Dagstuhl kommt für die Unterkunft und Verpflegung der Kinder auf. Wenn statt Inanspruchnahme der Kinderbetreuung von Schloss Dagstuhl eine Betreuungsperson mitreist, hat diese ebenfalls freien Aufenthalt.

Dagstuhls Angebot der Kinderbetreuung.für Eltern wird prinzipiell gut genutzt. Pandemiebedingt wurden im Jahr 2020 jedoch nur 2 Kinder durch eine Tagesmutter und 1 weiteres durch Verwandte bzw. durch die Eltern selbst betreut. Insgesamt beherbergte Schloss Dagstuhl 3 Kinder von Teilnehmern an 3 Veranstaltungen während 3 Wochen.

Freizeit und Ambiente

Die Freizeitanlagen auf Schloss Dagstuhl wurden so gestaltet, dass sie auf unterschiedliche Art und Weise sowohl tagsüber als auch abends die Kommunikation zwischen den Seminarteilnehmern fördern. Die Mischung aus Arbeit und Freizeit in entspannter, familiärer Atmosphäre ist ein wichtiger Bestandteil des Dagstuhl-Konzepts. Gäste leben und arbeiten zusammen in einem Komplex aus drei Gebäuden, im Zentrum das historische Schloss, wo sie rund um die Uhr freien Zugang zu den zahlreichen Freizeiträumen und -anlagen haben. Musikalische Gäste können ihre Fertigkeiten im barocken Musiksaal zu Gehör bringen, wo ein Flügel und diverse andere Instrumente wie z. B. zwei Konzertgitarren zur Verfügung stehen. Unser Zentrum verfügt außerdem über eine Sauna, einen Billardtisch, Tischfußball, Mountainbikes, eine Dartscheibe, einen Freizeitraum mit Fitnessgeräten und Tischtennis sowie einen Außenbereich mit Volleyballnetz.

Childcare

Schloss Dagstuhl gladly offers to organize childcare with a certified nanny for participants who need to visit our center with young children. The service, which supports families and particularly women computer scientists, can be booked for a small recompense prior to the seminar.

Parents also have the option to bring along their own “nanny,” usually a spouse or relative. In the case of seminar participants the costs for room and board are absorbed by the center for the children. If an own nanny takes care for the children instead of Dagstuhls childcare service, also the cost for the accompanying person for room and board are absorbed by Dagstuhl.

Guests make good use of Dagstuhl’s childcare offer for parents. However, due to the pandemic, Dagstuhl hosted only 3 children in 2020, 2 of whom were cared for by a nanny on site, 1 by relatives or their parents. Participants of 3 events in 3 weeks were thus able to attend although they were traveling with their children.

Leisure Facilities

Leisure facilities at Schloss Dagstuhl are designed to encourage and support communication among seminar participants in different settings throughout the day and evening. This work/life continuum within a relaxed, informal setting is an important part of the Dagstuhl concept. Guests live and work together in a complex of three buildings, the historical manor house (“Schloss”) in the middle, and enjoy full access to the center’s many unique rooms and facilities around the clock. Musically talented guests are welcome to exercise their skills in the baroque music room on the upper floor of the historical main building, which features a grand piano and various other instruments, e.g., two concert guitars. Schloss Dagstuhl also has a full sauna, a pool table, table football facilities, mountain bikes, a dartboard, and a recreation room with gym equipment and table tennis as well as outdoor sports grounds featuring a volleyball net.

Geschäftsstelle in Saarbrücken 8.2

Die Geschäftsstelle in Saarbrücken befindet sich auf dem Campus der Universität des Saarlandes im Gebäude E11. Die Räumlichkeiten werden vom Sachbearbeitungsteam und von einem Teil des wissenschaftlichen Stabs genutzt. Es hat sich gezeigt, dass ein großer Teil unserer Tätigkeit enge Zusammenarbeit zwischen dem wissenschaftlichen Stab und dem Sachbearbeitungsteam erfordert. Darüber hinaus profitiert der wissenschaftliche Stab davon, dass sich auf dem Campus in Saarbrücken viele Informatiker in unmittelbarer Nähe befinden.

Dagstuhl Office at Saarbrücken 8.2

The Dagstuhl Office in Saarbrücken is located on the campus of Saarland University in building E11. The site houses some administrative staff and a part of the scientific staff. By now, it is clear that a big part of our work requires close interaction between scientific and administrative staff. The scientific staff benefit from the availability of a very large number of computer scientists on the Saarbrücken campus.

Dagstuhl an der Universität Trier 8.3

Die für die Bibliographiedatenbank dblp zuständigen Mitarbeiter haben ihren Standort an der Universität Trier. Die Ende 2010 zunächst auf Basis zweier Projekte gestartete Zusammenarbeit zwischen Schloss Dagstuhl und der Universität Trier wurde im November 2018 in eine offizielle und permanente Außenstelle von Schloss Dagstuhl auf dem Campus der Universität Trier überführt. Dabei profitiert das dblp-Team von der engen Zusammenarbeit mit der Abteilung Informatikwissenschaften und als externer Partner im Digital Research and Bibliographic Meta Data Lab des Center for Informatics Research and Technology (CIRT).

Dagstuhl at University of Trier 8.3

The scientific and editorial staff working on the *dblp computer science bibliography* is located at the Dagstuhl offices at the University of Trier. Initially based on a project-based cooperation between Schloss Dagstuhl and the University of Trier which was first established in 2010, in November 2018, an official and permanent Schloss Dagstuhl branch office has been established on the campus of the University of Trier. In Trier, the dblp team benefits from the close cooperation with the University's department of computer sciences, and as an external partner in the Center for Informatics Research and Technology (CIRT) lab for Digital Research and Bibliographic Meta Data.

9 Zentrale Dienste
Central Services

Schloss Dagstuhl verfügt über zwei zentrale Dienste: die IT-Abteilung und eine Forschungsbibliothek. Beide Einrichtungen befinden sich am Hauptstandort in Wadern.

Bibliothek

Zur wissenschaftlichen Literatur- und Informationsversorgung der Seminarteilnehmer unterhält Schloss Dagstuhl eine hervorragende Forschungsbibliothek für Informatik.

Die Bibliothek ist für Wissenschaftler vor Ort rund um die Uhr und für externe Wissenschaftler nach Absprache zugänglich. Zur digitalen Informationsinfrastruktur gehören ein Online-Bibliothekskatalog, ein modernes Discovery-System zur Artikelrecherche sowie zahlreiche Angebote für den Online-Zugriff auf wissenschaftliche Publikationen.

Für jedes Seminar wird eine individuelle Buchausstellung zusammengestellt, bestehend aus Büchern, die von Seminarteilnehmern verfasst oder herausgegeben wurden. Die anwesenden Autoren werden gleichzeitig gebeten, ihre Bücher zu signieren. Zur Optimierung der Autorenidentifikation werden die ORCIDs der Personennamen im Bibliothekskatalog erfasst.

Außerdem wird der Name eines jeden Seminarteilnehmers in der Online-Teilnehmerliste mit seinen oder ihren in der dblp-Literaturdatenbank erfassten Veröffentlichungen verlinkt. Diese Maßnahmen ermöglichen den Seminarteilnehmern einfachen und schnellen Zugriff auf seminarrelevante Literatur.

Die Bibliothek verfügt über einen umfangreichen Buchbestand, der Zugriff auf aktuelle Forschungspublikationen wie Konferenzbände und wissenschaftliche Zeitschriften erfolgt ausschließlich digital.

- Der Buchbestand orientiert sich am wissenschaftlichen Seminarprogramm. Bei Neuanschaffungen liegt der Fokus auf Büchern, die einen Bezug zu Dagstuhl-Seminaren oder Perspektiven-Workshops haben oder von Seminarorganisatoren oder -teilnehmern verfasst wurden. Außerdem erhält die Bibliothek zahlreiche Bücher als Spenden von Verlagen und Autoren. Aktuell verfügt die Bibliothek über etwa 36 000 Informatikbücher. Die Metadaten werden standardisiert erfasst und mit Hyperlinks angereichert, die durch persistente Adressierung (DOIs) verlässlich verlinkt sind.
- Beiträge in Konferenzbänden verkörpern den wichtigsten Teil der Literatur in der Informatik. Die Bibliothek hat die kompletten ACM- und IEEE-Proceedings elektronisch abonniert. Ältere Bände stehen teilweise auch in Druckform zur Verfügung. Die Verlagsgruppe SpringerNature spendet der Bibliothek alle Bände der Reihe Lecture Notes in Computer Science (LNCS) sowohl in Druckform als auch elektronisch. Die Bibliothek verfügt somit über Druckexemplare aller veröffentlichten Bände ab Band 1.
- Wissenschaftliche Fachzeitschriften sind eine wesentliche Voraussetzung für exzellente Forschung. Häufig werden in Zeitschriften erweiterte Fassungen von

Schloss Dagstuhl has two central services: the IT service and a research library, which are both located at the main site in Wadern.

9.1 *Research Library*

Schloss Dagstuhl maintains an excellent research library for computer science to provide seminar participants with scientific literature and information.

The library is accessible to on-site researchers around the clock and to external researchers by appointment. The digital information infrastructure includes an online library catalog, a modern discovery system for article research as well as numerous options for online access to scientific publications.

For each seminar, an individual book exhibition is compiled, consisting of books written or edited by seminar participants. The authors who are present at the seminar are asked to sign their own books. In order to optimize the author identification, the ORCIDs of the authors' names are recorded in the library catalog.

In addition, the name of each seminar participant will be linked in the online list of participants with their publications recorded in the dblp literature database. These measures provide seminar participants with easy and quick access to the literature relevant to the seminar.

The library maintains an extensive collection of books. Access to current research publications such as conference proceedings and scientific journals is exclusively digital.

- The book collection is oriented towards the scientific seminar program. New acquisitions focus on books which are related to Dagstuhl Seminars and Perspectives Workshops or which were written by seminar organizers or participants. In addition, the library receives numerous books as donations from publishers and authors. Currently, the library has about 36,000 books on computer science. The metadata are recorded in a standardized way and enriched with hyperlinks, which are reliably linked by permanent addressing (DOIs).
- Contributions in conference proceedings represent the most important part of the literature in computer science. The library has subscribed to the complete ACM and IEEE proceedings electronically. Earlier volumes are also partly available in printed form. The Springer-Nature publishing group donates all volumes of the series Lecture Notes in Computer Science (LNCS) to the library both in print and in electronic form. The library thus has print copies of all published volumes from volume 1 onwards.
- Scientific journals are essential for excellent research. Journals often publish extended versions of results that were previously published in conference proceedings. The library provides access to several thousand digital scientific journals. Most of them are included in journal packages licensed in cooperation with nationwide consortia, such as DFG-funded national and alliance

Ergebnissen veröffentlicht, die zuvor in Konferenzbänden publiziert wurden. Die Bibliothek bietet Zugriff auf mehrere Tausend digitale Fachzeitschriften. Die meisten sind in Zeitschriftenpaketen enthalten, die in Kooperation mit deutschlandweiten Konsortien lizenziert sind, beispielsweise DFG-geförderte National- und Allianzlizenzen sowie von der Leibniz-Gemeinschaft geförderte Konsortiallizenzen.

- Die Bibliothek ermöglicht den benutzerfreundlichen Online-Zugriff auf über 7 000 deutschlandweite und internationale Zeitungen und Magazine aus über 120 Ländern.
- Um den Seminarteilnehmern temporär einen coronakonformen ausreichend großen Raum für die Seminarkaffeepause mit genügend Abstand und Lüftungsmöglichkeiten zu bieten, wurde im Sommer 2020 eine komplette Etage der Bibliothek frei geräumt. Der durch diesen Rückbau entstandene enorme Regalplatzverlust hatte umfangreiche Bestandsumräum- sowie Bestandspflegearbeiten zur Folge.

Zusammenarbeit

Schloss Dagstuhls Forschungsbibliothek ist mit zahlreichen überregionalen Bibliotheksdatenbanken vernetzt. Der komplette Zeitschriftenbestand ist in der Zeitschriftendatenbank (ZDB) nachgewiesen. Zusätzlich ist der Bestand an elektronischen Zeitschriften in der kooperativen bundesweiten Elektronischen Zeitschriftenbibliothek (EZB) erfasst. Darüber hinaus wird der aktuelle Buchbestand im K10plus, der gemeinsamen Katalogisierungsdatenbank von GBV und SWB mit über 180 Millionen Nachweisen, nachgewiesen.

Diese Datenbanken bilden die Grundlage für den deutschlandweiten und internationalen Leihverkehr der Bibliotheken. Somit steht der Zeitschriftenbestand auch standortübergreifend und überregional für Fernleihzwecke zur Verfügung.

Außerdem besteht eine enge Zusammenarbeit zwischen Schloss Dagstuhl und der Saarländischen Universitäts-und Landesbibliothek (SULB), der Campusbibliothek für Informatik und Angewandte Mathematik an der Universität des Saarlandes sowie der Bibliothek des Leibniz-Instituts für Neue Materialien (INM), die sich alle in Saarbrücken befinden.

Schloss Dagstuhls Fachbibliothek ist institutionelles Mitglied des Deutschen Bibliotheksverbandes (DBV). Die Bibliothekarin Frau Meyer ist persönliches Mitglied im Berufsverband Information Bibliothek e.V. (BIB).

Spenden an die Bibliothek

Die Bibliothek von Schloss Dagstuhl profitiert von zahlreiche Spenden. So erhielt die Informatik-Fachbibliothek im Jahr 2020 Buchspenden von den Verlagen, die in Fig. 9.1 aufgeführt sind. Auch viele Seminarteilnehmer spenden der Bibliothek ihre Bücher. Autorenexemplare werden ebenso dankbar entgegengenommen. Insgesamt erhielt das Zentrum im Berichtszeitraum 613 Bände als Spenden von Verlagen und Seminarteilnehmern.

licenses as well as consortium licenses funded by the Leibniz Association.

- The library enables user-friendly online access to over 7,000 Germany-wide and international newspapers and magazines from over 120 countries.
- In order to temporarily offer seminar participants a corona-compliant room of sufficient size for the seminar coffee break with sufficient distance and ventilation options, an entire floor of the library was cleared in the summer of 2020. The enormous loss of shelf space that resulted from this deconstruction led to extensive inventory rearrangement and maintenance work.

Collaboration

Schloss Dagstuhl's research library is connected to numerous national library databases. The complete journal inventory is recorded in the Zeitschriftendatenbank (ZDB). In addition, the inventory of electronic journals is recorded in the cooperative nationwide Electronic Journals Library (Elektronische Zeitschriftenbibliothek, EZB). Furthermore, the current book stock is recorded in K10plus, the joint cataloging database of GBV and SWB with over 180 million records.

These databases form the foundation for the libraries' nationwide and international lending system. Thus the journal collections are also available for inter-library loan purposes across locations and regions.

There is also a close cooperation between Schloss Dagstuhl and the Saarland University and State Library (SULB), the Campus Library for Computer Science and Applied Mathematics at Saarland University and the library of the Leibniz Institute for New Materials (INM), all of which are located in Saarbrücken.

Schloss Dagstuhl's specialized library is an institutional member of the German Library Association (Deutscher Bibliotheksverband, DBV). The librarian Ms. Meyer is a personal member of the Professional Association Information and Libraries (Berufsverband Information Bibliothek e.V., BIB).

Library Donations

The Dagstuhl Informatics Research Library receives numerous book donations from publishers and seminar participants. In 2020, the Informatics Research Library received book donations from the publishers listed in Fig. 9.1. The center is also grateful for donations of author's copies. The center received a total of 613 volumes during the year 2019 as donations from publishing houses and seminar participants.

SIAM – Society for Industrial and Applied Mathematics
http://www.siam.org

Springer-Verlag GmbH | Springer Science+Business Media
http://www.springer.com

Fig. 9.1
Donations from publishers to the Dagstuhl library.

9.2 IT-Service

Die IT-Abteilung bietet umfassenden Support für alle internen Vorgänge an den drei Standorten. Darüber hinaus betreut sie die IT-Infrastruktur und -Dienste und bietet Unterstützung für alle Gäste bei Dagstuhl-Veranstaltungen.

Der IT-Service umfasst u.a.:

- Internetzugang über Ethernet und WLAN in allen Räumen. Für den WLAN-Zugang bietet Schloss Dagstuhl persönliche Accounts an und ist auch an der *eduroam*-Initiative beteiligt (eine praktische Alternative für Gäste, die bereits einen *eduroam*-Account haben). Innerhalb sämtlicher Einrichtungen stellt Schloss Dagstuhl ein weitläufiges Netzwerk von Zugangspunkten zum Drahtlosnetzwerk zur Verfügung, das aktiv überwacht und regelmäßig erweitert wird. Die Verbindung zum (externen) Internet wird durch zwei redundante 375 Mbit/s-Leitungen sichergestellt, betrieben durch den DFN e.V. (Deutsches Forschungsnetz).
- Fahrbare ebenso wie fest montierte Präsentationsmöglichkeiten in den Tagungsräumen. In den größeren Tagungsräumen können Vortragende den vorhandenen oder den eigenen Laptop verwenden.
- Zugang zu Netzwerkfarbdruckern, einem Scanner und einem Kopierer.
- Zugang zu gemeinschaftlich genutzten Computern mit den Betriebssystemen Microsoft Windows, Apple Mac OS X und Linux.
- Technischen Support für Seminarteilnehmer und Mitarbeiter von Schloss Dagstuhl.

Der IT-Service verwaltet (virtuelle) Server für alle Abteilungen, z.B.

- einen Webserver, auf dem sich Schloss Dagstuhls Internetpräsenz befindet (https://www.dagstuhl.de), die Informationen für Teilnehmer, zum Seminarprogramm usw. enthält,
- einen Server, auf dem sich DROPS befindet, Schloss Dagstuhls Publikationsplattform (http://drops.dagstuhl.de),
- den dblp-Server (https://dblp.dagstuhl.de und https://dblp.org).

Darüber hinaus stellt der IT-Service Tools für das gemeinschaftliche Arbeitsumfelds zur Verfügung und hält sie in Stand, z.B. *Sihot* (eine Software zur Organisation von Gastdaten), MySQL-Datenbanken, ownCloud (ein Cloud-basiertes Speichersystem) und weitere.

IT Service

The IT service provides comprehensive support for all internal operations at all three sites. Moreover, it provides IT infrastructure, services, and support for all guests of Dagstuhl events.

This service includes – among others – the following:

- Internet access via Ethernet and Wi-Fi throughout all rooms. For Wi-Fi access Schloss Dagstuhl offers personal accounts and also takes part in the *eduroam* service[36] (which is a comfortable option for guests with existing *eduroam* accounts). Within its facilities, Schloss Dagstuhl provides a generous network of professional-grade wireless network access points that is actively monitored and extended regularly. External internet access for Schloss Dagstuhl is provided through two redundant 375 Mbit/s connections that are managed by DFN e.V. (National Science Network).
- Mobile and stationary presentation facilities in meeting rooms. In large meeting rooms, presenters can use either a provided laptop or their own.
- Access to network color printers, a scanner, and a copier.
- Access to shared computers with operating systems Microsoft Windows, Apple Mac OS X, and Linux.
- Technical support for both seminar participants and Dagstuhl staff.

The IT service manages (virtualized) servers for Schloss Dagstuhl's divisions, such as

- a web-server hosting Schloss Dagstuhl's web page at https://www.dagstuhl.de, providing information for participants, information about the seminar program, etc.,
- a server hosting DROPS at http://drops.dagstuhl.de, Schloss Dagstuhl's publishing platform,
- the dblp server at https://dblp.dagstuhl.de and at https://dblp.org.

Furthermore, for internal work procedures, the IT service provides and maintains tools for a collaborative work environment, such as *Sihot* (a software for organizing guest data), MySQL data bases, ownCloud (a cloud-based storage system), and several others.

[36] *eduroam* (education roaming) is a world-wide roaming access service developed for the international research and education community, see https://www.eduroam.org.

Fig. 9.2
Impressions of Schloss Dagstuhl. Photo courtesy of Christoph Sorge.

10 Kunst
Art

Dagstuhl als Galerie 10.1 *Dagstuhl as Art Gallery*

Im sogenannten Kreuzgang des Neubaus werden regelmäßig Kunstausstellungen organisiert. Das großzügige Raumangebot der Wände des Flurs sowie die hervorragende Ausleuchtung mit starken Kontrasten zwischen Tag und Nacht bieten den Künstlern sehr gute Möglichkeiten, ihre Werke darzustellen. Die Kunstwerke an den Wänden des schmalen Gangs durchbrechen die Nüchternheit des Neubaus in anregender und angenehmer Weise. Die wechselnden Ausstellungen bieten einen erfrischenden und dynamischen Kontrast zu der ständigen Kunstsammlung von Schloss Dagstuhl.

Prof. Reinhard Wilhelm, ehemaliger wissenschaftlicher Direktor des Zentrums, fungierte nach seinem Eintritt in den Ruhestand im April 2014 weiterhin als Betreuer der Ausstellungsaktivitäten von Schloss Dagstuhl. Das Zentrum veranstaltet jährlich etwa drei bis vier Kunstausstellungen für jeweils zwei bis drei Monate.

Waren es bisher Künstler und einzelne Sammler, die ihre Werke ausstellten, so kam seit 2016 durch die Zusammenarbeit zwischen der Saarland-Sporttoto GmbH (kurz Saartoto), der Hochschule der Bildenden Künste Saar (kurz HBKsaar) und Schloss Dagstuhl die Sammlung von Saartoto als Reservoir für eine Ausstellungsserie hinzu. Als bedeutender Förderer von Künstlern besitzt Saartoto einen großen Bestand an Kunstwerken. Im Rahmen der Zusammenarbeit wird diese Kunstsammlung durch die HBKsaar erfasst und dokumentiert. Im Ergebnis wurden bis 2018 insgesamt drei Ausstellungen aus dem Fundus von Saartoto zusammengestellt und in Dagstuhl präsentiert.

Pandemiebedingt fand in 2020 nur eine Ausstellung statt, die nachfolgend beschrieben ist. Die jeweils aktuellen Ausstellungen sind nach Anmeldung auch für die interessierte Öffentlichkeit zugänglich.

»DAS LOCH DAS VON DER ANDEREN SEITE KAM«

Lola Sprenger wurde 1983 in Starnberg geboren. Sie begann ihr Studium an der Akademie der Bildenden Künste in München (2011/2012) in der Klasse von Professor Jean Marc Bustamante. 2012 setzte sie ihr Studium unter der Leitung von Professor Markus Oehlen fort, bei dem sie 2018 ihr Studium abschloss. Seit 2017 absolviert Lola Sprenger ein Masterstudium bei Professor Daniel Richter an der Akademie der Bildenden Künste in Wien.

Lola Sprenger entwickelte ein hybrides künstlerisches Verfahren an der Grenze zwischen Malerei und Zeichnung, ausschließlich mit trockenen Pigmenten auf Papier, bei dem im Endstadium die hellen und dunklen Farbtöne des pigmentierten Puders durch energetische zuckende Bewegungen eingerieben werden. In der Trockenmalerei findet die Künstlerin eine Methode, die sich dem von ihr verachteten literarischen Pathos widersetzt.

Art exhibitions are regularly organized in the so-called cloister of the new building. The spacious surroundings, excellent lighting, and dramatic day-to-night contrast offer artists a unique exhibition space. Arranged along the corridor walls, the artworks offset the otherwise ascetic nature of the new building. These temporary exhibits offer a fresh and dynamic counterpoint to the center's permanent collection, which can be found scattered throughout the three buildings.

Prof. Reinhard Wilhelm has continued to supervise the Schloss Dagstuhl art exhibitions following his retirement as the center's Scientific Director in April 2014. The center holds approximately three to four art exhibits per year, with each exhibit generally running for two to three months.

Until recently, the exhibitions were organized by artists and individual collectors. The year 2016, however, saw the establishment of a cooperation between Saarland-Sporttoto GmbH (Saartoto for short), Hochschule für Bildende Künste Saar (university of art and design; HBKsaar for short), and Schloss Dagstuhl, which makes Saartotos collection accessible to Schloss Dagstuhl for a series of exhibitions. Being a major art sponsor, Saartoto is in possession of a substantial art collection. In the context of this collaboration, HBKsaar takes stock of and documents Saartoto's art collection. As a result, a total of three exhibitions from the Saartoto collection had been curated and presented in Dagstuhl until 2018.

Due to the Covid-19 pandemic, there was only one exhibition (see below) hosted by Schloss Dagstuhl in 2020. Current exhibitions are open to the interested public upon request.

»DAS LOCH DAS VON DER ANDEREN SEITE KAM«[37]

Lola Sprenger was born in Starnberg in 1983. She started her studies at the Academy of Fine Arts in Munich (2011/2012) in the class of Professor Jean Marc Bustamante. In 2012 she continued her studies under supervison of Professor Markus Oehlen, where she graduated in 2018. In 2017, she started her Master Studies under supervision of Professor Daniel Richter at the Academy of Fine Arts Vienna.

Lola Sprenger developed a hybrid artistic process at the line between painting and drawing. Working exclusively in dry pigments on paper the light and dark shades of the pigmented powder are rubbed in by energetic movements in the final stage. In dry painting she found a method to defy the literary pathos she so despises.

[37] engl. The hole which came from the other side

10.2 Kunstankauf durch Spenden

Im Jahr 2020 erhielt Schloss Dagstuhl insgesamt 1 000 € von verschiedenen Spendern. Wir möchten diese Stelle nutzen, allen Spendern, die 2020 zu der Kunstsammlung von Schloss Dagstuhl beigetragen haben, unseren Dank auszusprechen. Die Stifter werden sowohl in der virtuellen Internet-Galerie von Schloss Dagstuhl als auch an dem realen Objekt genannt.

Nähere Informationen und aktuelle Neuigkeiten finden sich auf der Kunst-Webseite[38] von Dagstuhl.

10.2 *Art Sponsorship and Donations*

In 2020, Schloss Dagstuhl received a total of 1,000 € from various donors. We would like to thank all donors who contributed to Dagstuhl's art collection in 2020. Donors' names appear in Dagstuhl's online art gallery and also next to the art items themselves.

For further information and current news about Dagstuhl's art program, please visit Dagstuhls's art webpage[38].

10.3 Dagstuhls permanente Kunstausstellung

Die von Gästen immer wieder positiv hervorgehobene Kunstsammlung geht auf den Gründungsdirektor Professor Wilhelm zurück. Seine Idee war es, den 1995 neueröffneten Speisesaal und den etwa ein Jahr älteren Neubau durch Kunstwerke zu beleben. Dazu startete er die oben beschrieben Kunstaustellungen. Unter Mitwirkung der Künstler wird aus ausgewählten Ausstellungen ein Werk ausgewählt, für das dann Spender gesucht werden. In den letzten 25 Jahren kamen so ungefähr 180 Kunstwerke zusammen. Auch durch diese Initiative angeregt und verstärkt erhielt Dagstuhl in den vergangenen Jahren weitere Spenden von Künstlern und Mäzenen. Die Arbeiten kommen in den Räumen des Zentrums in Wadern sowie in der Geschäftsstelle in Saarbrücken sehr gut zur Geltung.

10.3 *Dagstuhl's Permanent Art Exhibition*

The art collection, continually praised by guests, was initiated by Founding Director Professor Wilhelm. It was his idea to use works of art in order to enliven the New Building as well as the dining room opened in 1994 and 1995, respectively. To this end, Professor Wilhelm launched the exhibitions described above. Assisted by the artists, an artwork from selected exhibitions is chosen and donors are drummed up. Thus, approximately 180 works of art could be acquired over the last 25 years. Additionally, this initiative has increasingly encouraged artists and patrons to make donations. All of the pictures adorn the rooms of Schloss Dagstuhl in Wadern as well as the Dagstuhl Office in Saarbrücken.

[38] https://www.dagstuhl.de/art/

11 Struktur der Gesellschaft
Structure of the Company

Gründung und Gesellschafter 11.1 *Formation and Shareholders*

Schloss Dagstuhl ist als eine gemeinnützige GmbH mit elf Gesellschaftern (siehe Fig. 11.1) organisiert. Dies sind einerseits die vier Gesellschafter, die Schloss Dagstuhl gegründet haben, nämlich die Gesellschaft für Informatik e. V. (GI), die Universität des Saarlandes, die Technische Universität Kaiserslautern und das Karlsruher Institut für Technologie (KIT). Als vier weitere Gesellschafter wurden 1994 die Technische Universität Darmstadt, die Johann Wolfgang Goethe-Universität Frankfurt am Main, die Universität Stuttgart und die Universität Trier aufgenommen. Drei international renommierte Forschungsinstitute, das Institut National de Recherche en Informatique et en Automatique (INRIA, Frankreich), das Centrum Wiskunde & Informatica (CWI, Niederlande) und die Max-Planck-Gesellschaft (MPG, Deutschland) wurden 2005/2006 als weitere Gesellschafter aufgenommen.

Aufgrund eines Beschlusses der Bund-Länder-Kommission für Bildungsplanung und Forschungsförderung (heute Gemeinsame Wissenschaftskonferenz) wurde das Zentrum mit Wirkung zum 1. Januar 2006 als Serviceeinrichtung für die Forschung in die gemeinsame Forschungsförderung von Bund und Ländern aufgenommen. Es ist seit 2005 Mitglied der Leibniz-Gemeinschaft. Entsprechend wurde 2008 der Name des Zentrums von vormals „Internationales Begegnungs- und Forschungszentrum für Informatik“ in „Schloss Dagstuhl – Leibniz-Zentrum für Informatik“ geändert.

Schloss Dagstuhl wurde im Juli 2009 erstmals durch die Leibniz-Gemeinschaft evaluiert. Die Stellungnahme der Evaluierungs-Kommission vom März 2010 war sehr positiv: Schloss Dagstuhl widme sich mit herausragendem Erfolg seiner Aufgabe, die internationale Informatikforschung mit einem Seminarzentrum für wissenschaftliche Veranstaltungen zu unterstützen. Schloss Dagstuhl wurde 2016 erneut mit hervorragendem Ergebnis evaluiert. In der Stellungnahme des Senats der Leibniz-Gemeinschaft wurde das Veranstaltungsprogramm und die Beteiligung an der Literaturdatenbank dblp als „exzellent“ bewertet, während der Bereich Open Access (Publishing) als „sehr gut“ bewertet wurde.

Schloss Dagstuhl is operated as a non-profit organization by eleven associates (cf. Fig. 11.1), including its four founding associates: the Gesellschaft für Informatik e. V.[39] (GI), the Universität des Saarlandes, the Technische Universität Kaiserslautern, and the Karlsruher Institut für Technologie (KIT). In 1994, the organization was extended to include four new associates: the Technische Universität Darmstadt, the Johann Wolfgang Goethe-Universität Frankfurt am Main, the Universität Stuttgart and the Universität Trier. Finally, in 2005 and 2006, three internationally renowned research institutes joined the association: the Institut National de Recherche en Informatique et en Automatique (INRIA, France), the Centrum Wiskunde & Informatica (CWI, Netherlands), and the Max-Planck-Gesellschaft (MPG, Germany).

By resolution of the Bund-Länder-Kommission für Bildungsplanung und Forschungsförderung[40] (today Joint Science Conference) the center has been classified as a research service institution for joint funding by the German federal and state governments since January 2006. Since 2005, Schloss Dagstuhl has been a member of the Leibniz Association and changed its name accordingly from “Internationales Begegnungs- und Forschungszentrum für Informatik”[41] to “Schloss Dagstuhl – Leibniz-Zentrum für Informatik”[42] in 2008.

In July 2009, Schloss Dagstuhl was evaluated for the first time by the Leibniz Association. The March 2010 findings of the evaluation commission were very positive, and established that the center has shown outstanding commitment to its designated task of supporting the international computer science research community by providing a seminar center for academic events. In 2016, Schloss Dagstuhl has been evaluated again, with excellent results. In the Leibniz Association Senate report, the seminar program and the cooperation with the computer science bibliography dblp were rated as “excellent” whereas the Open Access Publishing was rated “very good.”

Organe der Gesellschaft 11.2 *Dagstuhl Organs*

Die drei Organe von Schloss Dagstuhl – Leibniz-Zentrum für Informatik GmbH, die stellvertretend für die Gesellschaft als juristische Person handeln, sind die folgenden:

- Gesellschafterversammlung
- Aufsichtsrat
- Geschäftsführung

Details zu den Organen sind den folgenden Abschnitten zu entnehmen.

The three organs of Schloss Dagstuhl – Leibniz-Zentrum für Informatik GmbH, which act for the company as a legal entity, are the following:

- Shareholders’ Meeting
- Supervisory Board
- Management

Detailed information is given in the sections below.

[39] engl.: German Informatics Society
[40] engl.: Federal/State Government Commission for Educational Planning and Research Promotion
[41] engl.: International Conference and Research Center for Computer Science
[42] engl.: Schloss Dagstuhl – Leibniz Center for Informatics

Die Gesellschafterversammlung

Die Gesellschafter beschließen über alle Änderungen an der Gesellschaft, insbesondere über die Aufnahme weiterer Gesellschafter, über die Änderung des Gesellschaftsvertrags und über ihre Auflösung. Die Gesellschafter bestätigen unter anderem auch die von Gesellschaftern neu entsandten Mitglieder in den Aufsichtsrat sowie die Berufung und Abberufung der Geschäftsführer. Derzeit haben anteilig nach der Höhe der Geschäftsanteile alle Gesellschafter die gleiche Anzahl von Stimmen, außer der Gesellschaft für Informatik, die die dreifache Anzahl besitzt. Beschlüsse werden entweder in der mindestens einmal jährlichen stattfindenden Gesellschafterversammlung gefasst oder durch schriftliche Stimmabgabe.

Der Aufsichtsrat

Der Aufsichtsrat ist verantwortlich dafür, dass die Geschäftsführung die Ziele der Gesellschaft rechtmäßig, zweckmäßig und wirtschaftlich sinnvoll erfüllt. Er wirkt in allen wesentlichen Angelegenheiten der Gesellschaft betreffend Forschung und Finanzplanung mit.

Die 12 Mitglieder des Aufsichtsrats (siehe Fig. 11.2) setzen sich aus vier Repräsentanten der Gesellschaft für Informatik, je einem Vertreter der drei Gründungsuniversitäten, zwei Vertretern der später hinzugekommenen vier Universitäten und je einem Vertreter des Bundes und der beiden Bundesländer Saarland und Rheinland-Pfalz, in denen Schloss Dagstuhl formal seinen Sitz hat, zusammen. Die reguläre Amtszeit der Aufsichtsratmitglieder beträgt mindestens vier volle, abgeschlossene Geschäftsjahre und endet mit der Entlastung für das vierte Geschäftsjahr. Die Vertreter der Universitäten in Darmstadt und Stuttgart wechseln im Allgemeinen Amtszeit für Amtszeit mit denen der Universitäten in Frankfurt und Trier ab.

Der Aufsichtsrat entscheidet über die Berufung und Abberufung der Geschäftsführer sowie der Mitglieder des Wissenschaftlichen Direktoriums, des Wissenschaftlichen Beirates und des Kuratoriums. Alle Beschlüsse, die die Finanzen oder das Vermögen der Firma betreffen, benötigen seine Zustimmung. Beschlüsse von forschungspolitischer Bedeutung und Beschlüsse mit erheblichen finanziellen Auswirkungen können nicht gegen die Stimmen der Vertreter des Bundes und der beiden Sitzländer gefasst werden. Der Aufsichtsrat entscheidet zudem über die Erteilung einer Prokura.

Die Geschäftsführung

Schloss Dagstuhl – Leibniz-Zentrum für Informatik GmbH hat zwei Geschäftsführer (siehe Fig. 11.3), die gemeinsam die Gesellschaft vertreten. Die Geschäftsführung besteht aus dem *Wissenschaftlichen Direktor* und dem *Technisch-administrativen Geschäftsführer*.

Der Wissenschaftliche Direktor ist verantwortlich für die wissenschaftlich-fachliche Zielsetzung und die Programmgestaltung, und ist zudem Mitglied und Vorsitzender des Wissenschaftlichen Direktoriums. Seit Mai 2014

Shareholders' Meeting

All changes to the company, in particular the inclusion of new associates, the revision of the Shareholders' agreement, and the dissolution of the company, are decided by the shareholders. Shareholders also confirm new members forwarded by them to the Supervisory Board and the appointment or recall of the managing directors. In accordance with their shares, all shareholders currently have the same number of votes except the Gesellschaft für Informatik, which has three times the number of votes of the other shareholders in proportion to its larger number of shares. Decisions are made in shareholders' meetings which take place at least once a year, or via a written vote.

Supervisory Board

The Supervisory Board is responsible for ensuring that the management complies with the center's objectives in a legally and economically meaningful manner. The board is involved in all essential matters with regard to research and financial planning.

The 12-member board (see Fig. 11.2) is composed of four representatives of the Gesellschaft für Informatik, one representative from each of the three founding universities, two representatives of the four universities that subsequently joined, and one representative from each of the German federal government and the two host state governments of Saarland and Rhineland-Palatinate. The Supervisory Board members typically hold office for at least four full fiscal years. The term of office ends with the approval for the fourth fiscal year. In general, representatives of the universities in Darmstadt and Stuttgart and of the universities in Frankfurt and Trier rotate after each term of office.

The Supervisory Board formally appoints and recalls the managing directors and members of the Scientific Directorate, Scientific Advisory Board, and Industrial Curatory Board. Furthermore, all decisions regarding financial issues and company assets must be approved by the Supervisory Board. Consent cannot be given against the votes of the represented (federal) state governments if the matter affects political issues in the area of science or has considerable financial weight. The Supervisory Board also holds decision power with respect to the granting of power of attorney.

Management

Schloss Dagstuhl – Leibniz-Zentrum für Informatik GmbH has two managing directors (see Fig. 11.3) who jointly represent the company. These are the *Scientific Director* and the *Technical Administrative Director*.

The Scientific Director is in charge of drafting the company's scientific goals and program planning, and is also a member and the chairperson of the Scientific Directorate. Since May 2014, Prof. Raimund Seidel, Ph.D., is the Scientific Director of Schloss Dagstuhl.

ist Prof. Raimund Seidel, Ph. D., der wissenschaftliche Direktor von Schloss Dagstuhl.

Der Wissenschaftliche Direktor wird dem Aufsichtsrat von einer Findungskommission zur Berufung vorgeschlagen. Dieser Findungskommission gehören mindestens der Vorsitzende des Aufsichtsrats und der Vorsitzende des Wissenschaftlichen Beirats an. Die Amtszeit des Wissenschaftlichen Direktors beträgt fünf Jahre.

Die technischen und administrativen Aufgaben werden vom Technisch-administrativen Geschäftsführer wahrgenommen. Seit Juli 2014 hat Frau Heike Meißner diese Position inne.

Gremien der Gesellschaft 11.3

Die Organe von Schloss Dagstuhl – Leibniz-Zentrum für Informatik GmbH werden durch drei Gremien unterstützt. Es sind die folgenden:

- Wissenschaftliches Direktorium
- Wissenschaftlicher Beirat
- Kuratorium

Details zu den Gremien werden in den folgenden Abschnitten ausgeführt.

Das Wissenschaftliche Direktorium

Das Wissenschaftliche Direktorium (siehe Fig. 11.4) ist für die Realisierung des Gesellschaftszwecks in fachlich-wissenschaftlicher Hinsicht verantwortlich. Es hat das Forschungs- und Veranstaltungsprogramm der Gesellschaft festzulegen, seine fachlich-wissenschaftliche Qualität zu sichern und seine Durchführung zu überwachen. Als wesentlicher Bestandteil dieser Aufgabe werden die Anträge auf Dagstuhl-Seminare und Dagstuhl-Perspektiven-Workshops von Mitgliedern des Wissenschaftlichen Direktoriums begutachtet. Auf den zweimal im Jahr stattfindenden Direktoriumssitzungen werden die Anträge diskutiert und es wird über ihre Annahme entschieden.

Der Wissenschaftliche Direktor gehört dem Wissenschaftlichen Direktorium an. Er empfiehlt dem Aufsichtsrat die Größe des Direktoriums. Neben den Gesellschaftern können das bestehende Wissenschaftliche Direktorium sowie der Beirat Kandidaten für das Wissenschaftliche Direktorium benennen. Die Auswahl der Kandidaten, die dem Aufsichtsrat zur Ernennung vorgeschlagen werden, obliegt dem Beirat zusammen mit dem Wissenschaftlichen Direktor.

Die Amtszeit der Mitglieder des Wissenschaftlichen Direktoriums – mit Ausnahme der des Wissenschaftlichen Direktors – beträgt drei Jahre. Sie beginnt am 1. November des Jahres ihrer Berufung und endet drei Jahre später am 31. Oktober. Wiederberufung ist möglich.

Der Wissenschaftliche Beirat

Die Aufgaben des Wissenschaftlichen Beirats (siehe Fig. 11.5) werden nicht nur durch den Gesellschaftsvertrag festgelegt, sondern auch durch die Empfehlungen der Leibniz-Gemeinschaft. Im Sinne dieser wirkt der Wissen-

The Supervisory Board appoints the Scientific Director on basis of the recommendation of a selection committee consisting of at least the chairperson of the Supervisory Board and the chairperson of the Scientific Advisory Board. The term of office of the Scientific Director is five years.

The Technical Administrative Director is responsible for technical and administrative tasks. Since July 2014, Ms Heike Meißner holds this position.

Dagstuhl Bodies

The organs of Schloss Dagstuhl – Leibniz-Zentrum für Informatik GmbH are supported by the following bodies:

- Scientific Directorate
- Scientific Advisory Board
- Industrial Curatory Board

Detailed information about these boards can be found in the sections below.

Scientific Directorate

The Scientific Directorate (see Fig. 11.4) is responsible for carrying out the company objectives from a technical and scientific point of view. It must determine the research and event program, ensure its technical and scientific quality, and monitor its execution. As a main task in support of this objective, members of the Scientific Directorate review proposals for Dagstuhl Seminars and Dagstuhl Perspectives Workshops. In its biannual directorate meetings, the Scientific Directorate discusses the proposals and decides which of them to accept or reject.

The Scientific Director is member of the Scientific Directorate. He recommends to the Supervisory Board the number of Scientific Directorate members. Candidates for the Scientific Directorate may be suggested not only by the shareholders, but also by the Scientific Directorate and the Scientific Advisory Board. The selection of candidates, which are recommended to the Supervisory Board for appointment, is carried out by the Scientific Advisory Board together with the Scientific Director.

The term of office of Scientific Directorate members – with the exception of the Scientific Director – is three years. It begins on November 1 of the year of appointment and ends three years later on October 31. Reelections are possible.

Scientific Advisory Board

The tasks of the Scientific Advisory Board (see Fig. 11.5) are not only defined by the Shareholders' Agreement, but also by the recommendations of the Leibniz Association. The latter stipulates two different ways in

schaftliche Beirat auf zwei Wegen bei der Qualitätssicherung mit. Zum einen berät er die Leitung in Fragen der Forschungs- und Entwicklungsplanung, nimmt Stellung zu den Programmbudgets und gibt Empfehlungen zum Ressourceneinsatz. Er unterstützt weiterhin den Aufsichtsrat bei wichtigen Entscheidungen zur Weiterentwicklung von Schloss Dagstuhl und bei der Gewinnung von Leitungspersonal. Zum anderen führt der Wissenschaftliche Beirat mindestens einmal zwischen je zwei Evaluierungen durch den Senatsausschuss Evaluierung (SAE) der Leibniz-Gemeinschaft ein Audit durch, bei dem die gesamte Einrichtung begutachtet wird. Ein Bericht über das Audit wird der Leitung, dem Aufsichtsrat und dem Senatsausschuss vorgelegt.

Der Wissenschaftliche Beirat sollte aus sechs bis zwölf international angesehenen, im Berufsleben stehenden Wissenschaftlern aus dem In- und Ausland bestehen. Die Amtszeit der Mitglieder beträgt vier Jahre, eine einmalige Wiederberufung ist möglich. Der Beirat wählt aus seiner Mitte einen Vorsitzenden. Der Wissenschaftliche Beirat tagt einmal im Jahr. Mitglieder des Beirats werden vom Aufsichtsrat auf Vorschlag des Beirats ernannt.

Das Kuratorium

Das Kuratorium (siehe Fig. 11.6) erfüllt eine Transmissionsfunktion zwischen Schloss Dagstuhl und den Forschungsabteilungen und Entwicklungslaboren der Industrie. Es hat die Aufgabe, die Akzeptanz des Zentrums in Verwaltung, Industrie und Wirtschaft abzusichern und als Förderungsorganisation die wirtschaftliche Basis des Zentrums zu verbreitern. Mitglieder des Kuratoriums werden vom Aufsichtsrat ernannt.

Nach seiner Geschäftsordnung hat das Kuratorium mindestens fünf Mitglieder, deren Amtszeit vier Jahre beträgt. Eine einmalige Wiederberufung ist möglich. Die Mitglieder des Kuratoriums unterstützen das Zentrum dabei, aktuelle Themen zu identifizieren und dazu geeignete zugkräftige Organisatoren aus der Industrie zu gewinnen. Sie werden ebenso gebeten, geeignete Personen aus der Industrie als Teilnehmer von Dagstuhl-Seminaren und Dagstuhl-Perspektiven-Workshops zu benennen. Das industrielle Kuratorium tagt einmal im Jahr zusammen mit dem Wissenschaftlichen Beirat.

which the Scientific Advisory Board is involved in quality assurance. On the one hand, the board offers advice to the management with regard to research as well as development planning and issues comments on the program budget draft, making recommendations on the use of resources. It also assists the Supervisory Board in important decisions with regard to future development of the institute as well as the acquisition of management staff. On the other hand, it carries out an audit of the entire institute between two evaluations by the Senatsausschuss Evaluierung (SAE, Senate Committee Evaluation) of the Leibniz Association. A report on this audit is sent to the management, the Supervisory Board, and the SAE.

The Scientific Advisory Board should consist of six to twelve internationally reputable, well established scientists and academics from Germany and abroad. The term of office for members is four years and can be prolonged once. The Scientific Advisory Board members elect a chairperson from their midst. The board convenes once a year. Members are appointed by the Supervisory Board in accordance with the suggestions of the Scientific Advisory Board.

Industrial Curatory Board

The Industrial Curatory Board (see Fig. 11.6) performs a transmissional function between the center and the industrial R&D departments and laboratories. Its role is to secure acceptance of Schloss Dagstuhl within the business, industry and administrative communities, and as a promotional organization to broaden the economic basis of the center. Board members are appointed by the Supervisory Board.

According to its rules of procedure, the Industrial Curatory Board consists of at least five members whose term of office is four years. A one-off reappointment for a second term is possible. The board members help the center to identify current R&D topics for seminars and locate attractive organizers in industry. The Industrial Curatory Board is regularly called upon to propose suitable participants for Dagstuhl Seminars and Dagstuhl Perspectives Workshops known to it from its activities. It convenes once a year together with the Scientific Advisory Board.

Gesellschafter | Associates
Centrum Wiskunde & Informatica (CWI), The Netherlands
Gesellschaft für Informatik e. V., Germany
Institut National de Recherche en Informatique et en Automatique (INRIA), France
Johann Wolfgang Goethe-Universität Frankfurt am Main, Germany
Karlsruher Institut für Technologie (KIT), Germany
Max-Planck-Gesellschaft zur Förderung der Wissenschaften e. V., Berlin, Germany
Technische Universität Darmstadt, Germany
Technische Universität Kaiserslautern, Germany
Universität des Saarlandes, Germany
Universität Stuttgart, Germany
Universität Trier, Germany

Fig. 11.1
Associates.

Aufsichtsrat | Supervisory Board
Dr. Marc Brüser Ministerium für Wissenschaft, Weiterbildung und Kultur, Mainz, Germany | Representative of Rhineland-Palatinate state
Prof. Dr.-Ing. Hannes Federrath Universität Hamburg, Germany | Representative of Gesellschaft für Informatik e. V.
Prof. Dr.-Ing. Dr. h. c. Stefan Jähnichen Technische Universität Berlin, Germany | Representative of Gesellschaft für Informatik e. V. | Chairman of the Supervisory Board
Prof. Dr. Volker Lindenstruth Johann Wolfgang Goethe-Universität Frankfurt am Main, Germany | Representative of Johann Wolfgang Goethe-Universität Frankfurt am Main
Dr. Svenja Marx Bundesministerium für Bildung und Forschung, Bonn, Germany | Representative of the German federal government
Prof. Dr. Arnd Poetzsch-Heffter Technische Universität Kaiserslautern, Germany | Representative of Technische Universität Kaiserslautern
Dr. Susanne Reichrath Staatskanzlei des Saarlandes, Saarbrücken, Germany | Representative of the Saarland
Prof. Dr. Ralph Schenkel Universität Trier | Representative of Universität Trier
Prof. Dr. Manfred J. Schmitt Universität des Saarlandes, Saarbrücken, Germany | Representative of Universität des Saarlandes
Prof. Dr. Peter H. Schmitt Karlsruher Institut für Technologie, Germany | Representative of Karlsruher Institut für Technologie
Prof. em. Dr.-Ing. Dr.-Ing. h. c. Roland Vollmar Karlsruher Institut für Technologie, Germany | Representative of Gesellschaft für Informatik e. V.
Cornelia Winter Gesellschaft für Informatik e. V., Bonn, Germany | Representative of Gesellschaft für Informatik e. V

Fig. 11.2
Supervisory Board members.

Geschäftsführung | Management
Heike Meißner (Technisch-administrative Geschäftsführerin | Technical Administrative Director) Schloss Dagstuhl – Leibniz-Zentrum für Informatik GmbH, Wadern, Germany
Prof. Raimund Seidel, Ph. D. (Wissenschaftlicher Direktor | Scientific Director) Schloss Dagstuhl – Leibniz-Zentrum für Informatik GmbH, Wadern and Universität des Saarlandes, Saarbrücken, Germany

Fig. 11.3
Management.

Wissenschaftliches Direktorium | Scientific Directorate
Prof. Dr. Elisabeth André Universität Augsburg, Germany
Prof. Dr.-Ing. Franz Baader TU Dresden, Germany
Prof. Gilles Barthe, Ph. D. IMDEA Software Institue, Madrid, Spain and Max Planck Institute for Security and Privacy, Bochum, Germany
Prof. Dr. Daniel Cremers Technische Universität München, Germany
Goetz Graefe Google Inc., Madison, USA | *tenure started in November 2020*
Prof. Dr. Reiner Hähnle TU Darmstadt, Germany
Prof. Dr. Barbara Hammer Universität Bielefeld, Germany
Prof. Dr. Lynda Hardman Centrum Wiskunde & Informatica (CWI), Amsterdam and University of Utrecht, The Netherlands
Prof. Dr.-Ing. Oliver Kohlbacher Eberhard Karls Universität Tübingen, Germany
Dr. Steve Kremer Institut National de Recherche en Informatique et en Automatique (INRIA), Nancy – Grand Est, France | *tenure started in November 2020*
Prof. Dr.-Ing. Bernhard Mitschang Universität Stuttgart, Germany
Prof. Dr. Albrecht Schmidt Ludwig-Maximilians Universität München, Germany
Prof. Dr.-Ing. Wolfgang Schröder-Preikschat Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany
Prof. Raimund Seidel, Ph. D. Universität des Saarlandes, Saarbrücken, Germany
Dr. Emmanuel Thomé Institut National de Recherche en Informatique et en Automatique (INRIA), Nancy – Grand Est, France | *tenure ended in October 2020*
Prof. Dr. Heike Wehrheim Universität Paderborn, Germany
Prof. Dr. Verena Wolf Universität des Saarlandes, Saarbrücken, Germany
Prof. Dr. Martina Zitterbart Karlsruher Institut für Technologie, Germany

Fig. 11.4
Scientific Directorate.

Wissenschaftlicher Beirat | Scientific Advisory Board
Prof. Dr. Christel Baier Technische Universität Dresden, Germany
Prof. Dr. Anja Feldmann Max-Planck-Institut für Informatik, Saarbrücken, Germany
Prof. Dr. Manuel V. Hermenegildo IMDEA Software Institute, Madrid and Technical University of Madrid, Spain | *tenure ended in December 2020*
Prof. Dr. Ir. Joost-Pieter Katoen, PDEng RWTH Aachen, Germany
Prof. Dr. Friedhelm Meyer auf der Heide Heinz Nixdorf Institute, Paderborn and Universität Paderborn, Germany | Chairman of the Scientific Advisory Board
Prof. Dr. Laurent Romary Centre Marc Bloch, Berlin, Germany and INRIA, Paris, France | *tenure started in January 2020*

Fig. 11.5
Scientific Advisory Board.

Kuratorium | Industrial Curatory Board
Dr. Goetz Graefe Google, Madison, Wisconsin, United States | *tenure ended in December 2020*
Christine Regitz SAP SE, Walldorf, Germany | *tenure started in January 2020*
Dr. Tim Harris Amazon, Cambridge, United Kingdom
Dr.-Ing. Andreas Wierse SICOS BW GmbH, Stuttgart, Germany
Dr. Thomas Ziegert SAP SE, Darmstadt, Germany

Fig. 11.6
Industrial Curatory Board.

12 Förderverein „Freunde von Dagstuhl“
Association “Friends of Dagstuhl”

Förderverein „Freunde von Dagstuhl“

Association “Friends of Dagstuhl”

Holger Hermanns (Universität des Saarlandes, Germany)
Erich Reindel (Universität des Saarlandes, Germany)

Seit Mitte 2014 gibt es den Verein zur Förderung von Schloss Dagstuhl — Leibniz-Zentrum für Informatik e.V.. Der sehr technische und holprig klingende Name spiegelt dabei exakt den Vereinszweck wider: die Förderung von Wissenschaft und Forschung im Leibniz-Zentrum für Informatik in Schloss Dagstuhl. Für die Webpräsenz wurde allerdings ein wesentlich geschmeidigerer Name gewählt: „Friends of Dagstuhl“ (http://www.friends-of-dagstuhl.de).

Der Verein ist darauf ausgerichtet, finanzielle Mittel zur erfolgreichen Umsetzung des Vereinszwecks zu beschaffen und bereitzustellen sowie die ihm zu diesem Zweck anvertrauten Mittel treuhänderisch zu verwalten. Die Stiftung Informatikzentrum Schloss Dagstuhl wurde daher auch als nicht rechtsfähige Stiftung in den Verein überführt. Seit Ende 2014 vertreten nun die Freunde von Dagstuhl die Stiftung im Rechts- und Geschäftsverkehr und verwalten das Stiftungsvermögen unter der strategischen Aufsicht eines Stiftungsrates (siehe Fig. 12.1). Der Verein wird von einem Vorstand (siehe Fig. 12.2 und Fig. 12.3) geleitet.

Das Stiftungsvermögen ist mit Hilfe einer professionellen und auf Stiftungen spezialisierten Vermögensverwaltungsgesellschaft angelegt worden, was sich gerade im von der Pandemie geprägten Jahr 2020 bis Redaktionsschluss bewährt hat. Der aufgrund der großzügigen Spende eines verstorbenen Freundes von Schloss Dagstuhl geplante Shuttle-Service vom Bahnhof Türkismühle nach Dagstuhl konnte pandemiebedingt noch nicht ausgerollt werden. Dieses wird aber nachgeholt, sobald der Tagungsbetrieb – hoffentlich im Spätsommer 2021 – wieder aufgenommen wird.

Es ist bemerkenswert, war aber wohl auch zu erwarten, dass an der satzungsgemäßen Vereinsversammlung am 03. Dezember 2020 relativ viele Mitglieder teilgenommen haben. Die Versammlung wurde per Videokonferenz durchgeführt und lange Anreisewege und -zeiten waren damit entfallen. So konnten wir sogar ein Mitglied aus London begrüßen. Es wurden zahlreiche Ideen zur Fortentwicklung der Vereinsaktivitäten angestoßen, denen der Vorstand nun nachgeht, soweit es die Pandemie zulässt.

Weitere Informationen zum Verein, aber auch Mitgliedschaftsanträge finden Sie unter http://www.friends-of-dagstuhl.de.

Since mid 2014, the registered association for support of Schloss Dagstuhl – Leibniz Center for Informatics (Verein zur Förderung von Schloss Dagstuhl – Leibniz-Zentrum für Informatik e.V.) exists. This very technical and rather clumsy name nevertheless reflects the precise purpose of the association: the support of science and research at the Leibniz Center for Informatics at Schloss Dagstuhl. A significantly smoother name, i.e., “Friends of Dagstuhl”, was chosen for the website (http://www.friends-of-dagstuhl.de).

The association aims at acquiring and providing funds for the successful execution of its purpose, as well as holding these funds in trust. The Dagstuhl Foundation (Stiftung Informatikzentrum Schloss Dagstuhl) was therefore integrated into the association as a dependent foundation. Since late 2014, the Friends of Dagstuhl represent the foundation in legal and business transactions and manage the foundation assets under the strategic supervision of a foundation council (see Fig. 12.1). The association is chaired by a board (see Fig. 12.2 and Fig. 12.3).

The foundation assets have been invested with the help of a professional asset management company specializing in foundations. This has proved its worth, especially in 2020, a year dominated by the pandemic up to the time of going to press. The shuttle service from Türkismühle train station to Dagstuhl, which was planned due to the generous donation of a deceased friend of Schloss Dagstuhl, could not yet be rolled out due to the pandemic. This will be made up for, however, as soon as on-site seminar operations resume – hopefully in late summer 2021.

It is remarkable, but was probably to be expected, that a relatively large number of members attended the statutory meeting of the Association on December 03, 2020. The meeting was conducted by video conference and long travel distances and times were thus eliminated. So we could even welcome a member from London. Numerous ideas for the further development of the association’s activities were initiated, which the board is now pursuing, as far as the pandemic allows.

Further information about the association as well as the membership application form can be found at http://www.friends-of-dagstuhl.de.

Stiftungsrat | Foundation council
Prof. Dr. Holger Hermanns (Vorstandsvorsitzender des Vereins “Friends of Dagstuhl” | First deputy chairperson of the association “Friends of Dagstuhl”) Universität des Saarlandes, Saarbrücken, Germany
Prof. Dr. Dr. h.c. mult. Kurt Mehlhorn Max Planck Institute for Informatics (MPII), Saarbrücken, Germany
Prof. Dr. Dorothea Wagner Karlsruher Institut für Technologie (KIT), Germany

Fig. 12.1
Der Stiftungsrat der Stiftung “Informatik-Zentrum Schloss Dagstuhl”
The council of the foundation “Informatik-Zentrum Schloss Dagstuhl”

Vorstand des Vereins | Chair of the association
Prof. Dr. Holger Hermanns (Vorstandsvorsitzender | First deputy chairperson) Universität des Saarlandes, Saarbrücken, Germany
Angelika Müller-von Brochowski (Schriftführerin | Secretary)
Erich Reindel (Schatzmeister | Treasurer) Universität des Saarlandes, Saarbrücken, Germany

Fig. 12.2
Der Vorstand des Vereins “Friends of Dagstuhl”
The chair of the association “Friends of Dagstuhl”

Fig. 12.3
Der Vorstand des Vereins “Friends of Dagstuhl”, v.l.n.r.: Prof. Dr. Holger Hermanns, Angelika Müller-von Brochowski, und Erich Reindel.
The chair of the association “Friends of Dagstuhl”, f.l.t.r.: Prof. Holger Hermanns, Angelika Müller-von Brochowski, and Erich Reindel.

13 Statistiken
Statistics

Statistiken zu Seminaren und Workshops

13.1

Statistics on Seminars and Workshops

In diesem Abschnitt werden statistische Daten zum wissenschaftlichen Programm und der Zusammenstellung der Teilnehmer aufgeführt. Die veranstaltungsbezogenen Werte weichen durch den pandemiebedingten Ausfall oder das Verschieben von Veranstaltungen erheblich von denen der Vorjahre ab. Die Diagramme und Tabellen sind dabei wie nachfolgend beschrieben gegliedert.

Antrags-bezogene Daten: Die Anzahl eingereichter Anträge von Dagstuhl Seminaren und Dagstuhl Perspektiven Workshops sowie deren Akzeptanzraten sind in Fig. 13.1 dargestellt. Fig. 13.2 zeigt, wie die akzeptierten Seminare und Workshops sich bezüglich Größe und Länge aufgliedern.

Veranstaltungs-bezogene Daten: Fig. 13.3 zeigt Anzahl und Anteil der eingeladenen Seminarteilnehmer, welche die Einladung annehmen bzw. ablehnen. Die Verteilung dieser Annahmerate ist in Fig. 13.4 dargestellt. Fig. 13.5 zeigt dagegen, wie viel Prozent der zugesagten Größe (gemessen an der Personenanzahl) tatsächlich von einem Seminar belegt wurde. Daten zu Anzahl, Größe und Dauer der durchgeführten Seminare sind in Fig. 13.6 angegeben. Fig. 13.7 zeigt die Anzahl der verschiedenen Veranstaltungstypen.

Teilnehmer-bezogene Daten: Die Teilnehmerzahlen – abhängig vom Veranstaltungstyp – gibt Fig. 13.8 an. Fig. 13.9 zeigt die Verteilung der Herkunftsländer unserer Gäste.

Umfrage-bezogene Daten: Hier stellen wir ausgewählte Daten unserer fortlaufenden Befragung von Teilnehmern an Dagstuhl-Seminaren und Dagstuhl-Perspektiven-Workshops dar. Ein Überblick über die Ergebnisse der regelmäßigen Gästebefragungen kann Fig. 13.10 entnommen werden. Die Anzahl von früheren Seminarbesuchen kann man Fig. 13.11 entnehmen. Fig. 13.12 gibt Auskunft über die Altersstruktur der Teilnehmer. Während Dagstuhl-Seminare und Dagstuhl-Perspektiven-Workshops sich primär an Forscher aus Universitäten und Forschungseinrichtungen richten, sind auch Anwender und Forscher aus der Industrie stets willkommen. Die Verteilung ihres Anteils ist in Fig. 13.13 gezeigt.

Auslastungs-bezogene Daten: Die Auslastung des Zentrums wird schließlich in Fig. 13.14 an Hand der Übernachtungen und ihrer Verteilung über die einzelnen Wochen getrennt nach Veranstaltungstypen aufgezeigt.

Geschlechter-bezogene Daten: Fig. 13.15 enthält Daten zur Geschlechter-Verteilung in der Seminarleitung. Dagegen zeigt Fig. 13.16 die Quote von Frauen bei der Beantragung von Seminaren sowohl bezüglich der Teams als auch bezüglich der gesamten Antragsteller. Die Abbildungen Fig. 13.17 und Fig. 13.18 zeigen insbesondere die Anteile weiblicher Teilnehmer bzw. Einladungen an weibliche Wissenschaftler. Die Verteilung der Rate der weiblichen Teilnehmer in den einzelnen Seminaren wird in Fig. 13.19 aufgezeigt.

This section provides statistical data about the scientific program and the composition of program participants. The meeting related values deviate considerably from those of previous years due to the cancellation or postponement of meetings caused by the pandemic. Charts and tables in this chapter may be outlined as follows.

Proposal-related data: Fig. 13.1 shows the number of submitted proposals for Dagstuhl Seminars and Dagstuhl Perspectives Workshops, as well as acceptance rates for recent years. The size and duration of accepted seminars and workshops are displayed in Fig. 13.2.

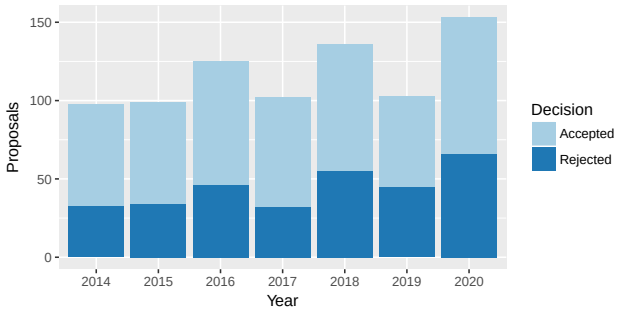
Event-related data: Fig. 13.3 shows the number and the fraction of invited seminar participants who accepted or declined the invitation. The distribution of the rate is given in Fig. 13.4. In contrast, Fig. 13.5 visualizes how much of the reserved space was actually used by seminar participants. Data related to the number of seminars held in the last years together with their sizes and durations are given in Fig. 13.6. Fig. 13.7 shows the distribution of different types of events at Dagstuhl.

Participant-related data: Fig. 13.8 shows the number of participants according to event type. Fig. 13.9 shows the distribution of country affiliations.

Survey-related data: In this section we present data obtained from our ongoing Dagstuhl Seminar and Dagstuhl Perspectives Workshop guest survey project. An overview of the results of the participants survey for Dagstuhl Seminars and Dagstuhl Perspectives Workshops can be found in Fig. 13.10. Fig. 13.11 displays how often participants have attended seminars in the past. Fig. 13.12 gives data on the seniority of participants. While Dagstuhl Seminars and Dagstuhl Perspectives Workshops are mainly oriented towards academic researchers, also researchers and developers from industry are welcome. The distribution of their ratio compared to all participants of a seminar is shown in Fig. 13.13.

Utilization-related data: Finally, Fig. 13.14 states the number of overnight stays – separated by event type – hosted at Schloss Dagstuhl as well as their distribution about the weeks.

Gender-related data: Fig. 13.15 shows mixed-gender data with respective to organizer teams of Dagstuhl Seminars and Dagstuhl Perspectives Workshops. In contrast Fig. 13.16 presents this data with respect to proposed seminar events. In Fig. 13.17 and Fig. 13.18 data is given with regard to female participants and invitees, respectively. The distribution of the rate of female participants by seminar and year is displayed in Fig. 13.19.

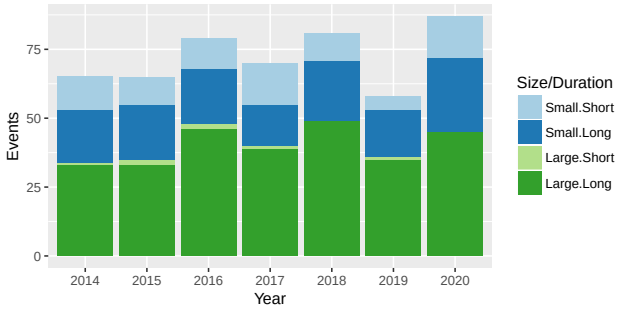


(a) Chart for 2014–2020

Year	Proposals	Accepted		Rejected	
	#	#	%	#	%
2014	98	65	66.3	33	33.7
2015	99	65	65.7	34	34.3
2016	125	79	63.2	46	36.8
2017	102	70	68.6	32	31.4
2018	136	81	59.6	55	40.4
2019	103	58	56.3	45	43.7
2020	153	87	56.9	66	43.1

(b) Detailed numbers for 2014–2020

Fig. 13.1
Proposals and acceptance rates for Dagstuhl Seminars and Dagstuhl Perspectives Workshops.

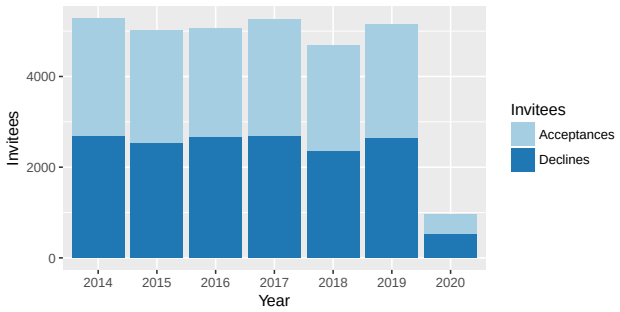


(a) Chart for 2014–2020

Year	30-person seminars		45-person seminars		Total
	3-day	5-day	3-day	5-day	
2014	12	19	1	33	65
2015	10	20	2	33	65
2016	11	20	2	46	79
2017	15	15	1	39	70
2018	10	22	0	49	81
2019	5	17	1	35	58
2020	15	27	0	45	87

(b) Detailed numbers for 2014–2020

Fig. 13.2
Size and duration of Dagstuhl Seminars and Dagstuhl Perspectives Workshops accepted in 2014–2020. Small = 30-person seminar, Large = 45-person seminar, Short = 3-day seminar, Long = 5-day seminar.

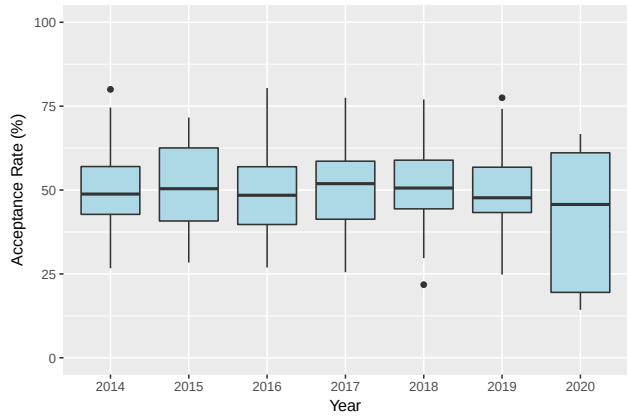


(a) Chart for 2014–2020

Year	Invitees	Acceptances		Declines	
	#	#	%	#	%
2014	5285	2590	49.0	2695	51.0
2015	5023	2473	49.2	2550	50.8
2016	5060	2393	47.3	2667	52.7
2017	5267	2572	48.8	2695	51.2
2018	4692	2320	49.4	2372	50.6
2019	5143	2498	48.6	2645	51.4
2020	962	419	43.6	543	56.4

(b) Detailed numbers for 2014–2020

Fig. 13.3
Total number of invitees, acceptances, and declines for Dagstuhl Seminars and Dagstuhl Perspectives Workshops.

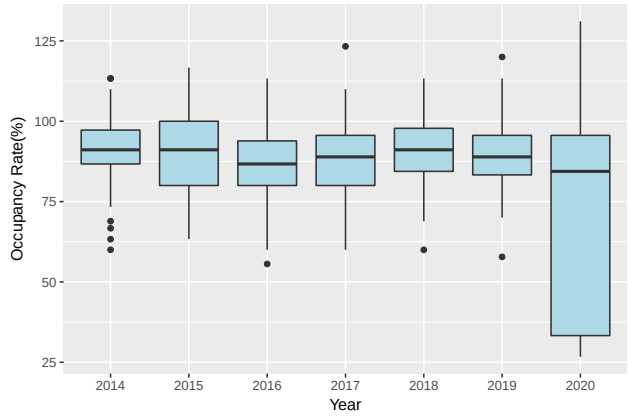


(a) Chart for 2014–2020

Year	Min (%)	Max (%)	Avg (%)	Std (%)
2014	26.7	80.0	50.2	11.2
2015	28.4	71.6	50.7	12.4
2016	26.9	80.4	48.6	11.2
2017	25.5	77.5	50.3	12.4
2018	21.8	77.0	51.2	12.0
2019	24.8	77.5	49.8	11.4
2020	14.3	66.7	42.2	19.2

(b) Detailed numbers for 2014–2020

Fig. 13.4
Distribution of the acceptance rate per Dagstuhl Seminar or Dagstuhl Perspectives Workshop in 2014–2020. Min = minimal value, Max = maximal value, Avg = average, Std = standard deviation.

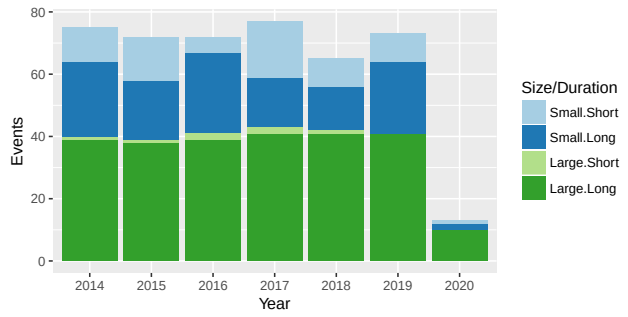


(a) Chart for 2014–2020

Year	Min (%)	Max (%)	Avg (%)	Std (%)
2014	60.0	113.3	90.6	10.3
2015	63.3	116.7	89.6	12.5
2016	55.6	113.3	86.7	11.8
2017	60.0	123.3	87.3	12.3
2018	60.0	113.3	90.3	10.2
2019	57.8	120.0	89.1	10.7
2020	26.7	131.1	73.8	32.2

(b) Detailed numbers for 2014–2020

Fig. 13.5
Distribution of the occupancy rate per Dagstuhl Seminar or Dagstuhl Perspectives Workshop in 2014–2020. Min = minimal value, Max = maximal value, Avg = average, Std = standard deviation.

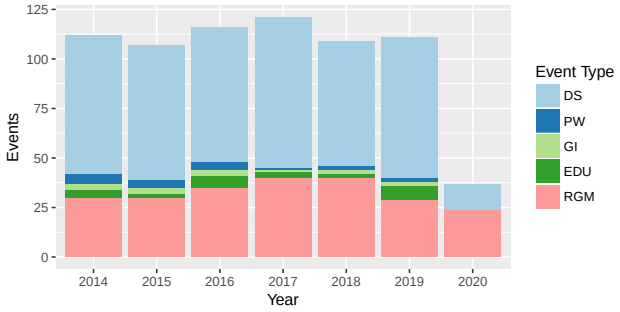


(a) Chart for 2014–2020

Year	30-person seminars		45-person seminars		Total
	3-day	5-day	3-day	5-day	
2014	11	24	1	39	75
2015	14	19	1	38	72
2016	5	26	2	39	72
2017	18	16	2	41	77
2018	9	14	1	41	65
2019	9	23	0	41	73
2020	1	2	0	10	13

(b) Detailed numbers for 2014–2020

Fig. 13.6
Size and duration of Dagstuhl Seminars and Dagstuhl Perspectives Workshops held in 2014–2020. Small = 30-person seminar, Large = 45-person seminar, Short = 3-day seminar, Long = 5-day seminar.

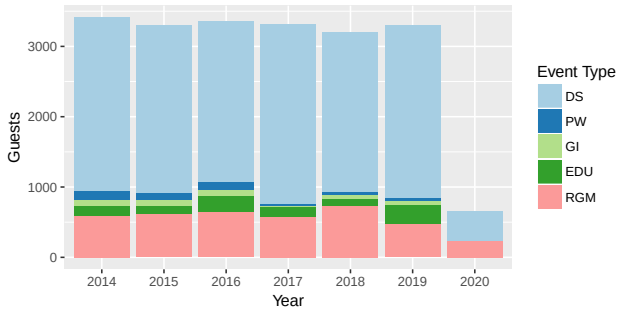


(a) Chart for 2014–2020

Year	DS	PW	GI	EDU	RGM	Total
2014	70	5	3	4	30	112
2015	68	4	3	2	30	107
2016	68	4	3	6	35	116
2017	76	1	1	3	40	121
2018	63	2	2	2	40	109
2019	71	2	2	7	29	111
2020	13	0	0	0	24	37

(b) Detailed numbers for 2014–2020

Fig. 13.7
Number of all events held at Dagstuhl, by type. DS = Dagstuhl Seminar, PW = Dagstuhl Perspectives Workshop, GI = GI-Dagstuhl Seminar, EDU = educational event, RGM = research group meeting.



(a) Chart for 2014–2020

Year	DS		PW		GI		EDU		RGM		Total
	#	%	#	%	#	%	#	%	#	%	#
2014	2463	72.2	127	3.7	86	2.5	144	4.2	589	17.3	3409
2015	2385	72.3	88	2.7	90	2.7	111	3.4	624	18.9	3298
2016	2280	68.0	113	3.4	78	2.3	232	6.9	650	19.4	3353
2017	2551	77.1	21	0.6	21	0.6	131	4.0	584	17.7	3308
2018	2268	70.8	52	1.6	50	1.6	99	3.1	733	22.9	3202
2019	2450	74.3	48	1.5	50	1.5	282	8.5	469	14.2	3299
2020	419	63.9	0	0.0	0	0.0	0	0.0	237	36.1	656

(b) Detailed numbers for 2014–2020

Fig. 13.8
Number of participants. DS = Dagstuhl Seminar, PW = Dagstuhl Perspectives Workshop, GI = GI-Dagstuhl Seminar, EDU = educational event, RGM = research group meeting.

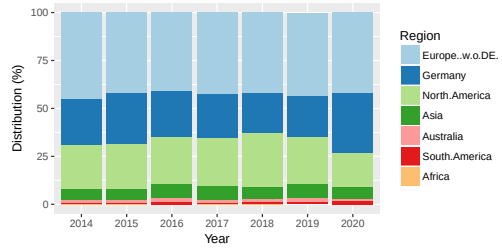
Country	A	B	Total
Germany	131	217	348
United States	68	1	69
United Kingdom	33	3	36
France	32	1	33
Netherlands	24	4	28
Switzerland	17	1	18
Italy	12	0	12
Belgium	9	1	10
Austria	6	3	9
Japan	9	0	9
Canada	7	0	7
Israel	7	0	7
Sweden	7	0	7
Australia	4	2	6
India	6	0	6
Spain	4	2	6
Chile	5	0	5
Finland	5	0	5

Country	A	B	Total
Portugal	5	0	5
Czech Republic	3	0	3
Denmark	2	1	3
Greece	3	0	3
Ireland	3	0	3
Luxembourg	3	0	3
Brazil	1	1	2
China	2	0	2
New Zealand	2	0	2
Estonia	1	0	1
Kyrgyzstan	1	0	1
Mexico	1	0	1
Norway	1	0	1
Poland	1	0	1
Russian Federation	1	0	1
Slovak Republic	1	0	1
Slovenia	1	0	1
Turkey	1	0	1
Total	419	237	656

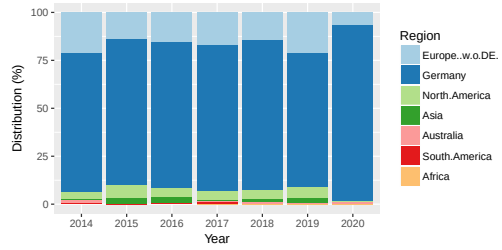
(a) Details for 2020 by country

Region	A		B		Total	
	#	%	#	%	#	%
Germany	131	31.3	217	91.6	348	53
Europe (w/o Germany)	175	41.8	16	6.8	191	29.1
North America	75	17.9	1	0.4	76	11.6
Asia	25	6	0	0	25	3.8
Australia	6	1.4	2	0.8	8	1.2
South America	7	1.7	1	0.4	8	1.2
Total	419	100	237	100	656	100

(b) Details for 2020 by region



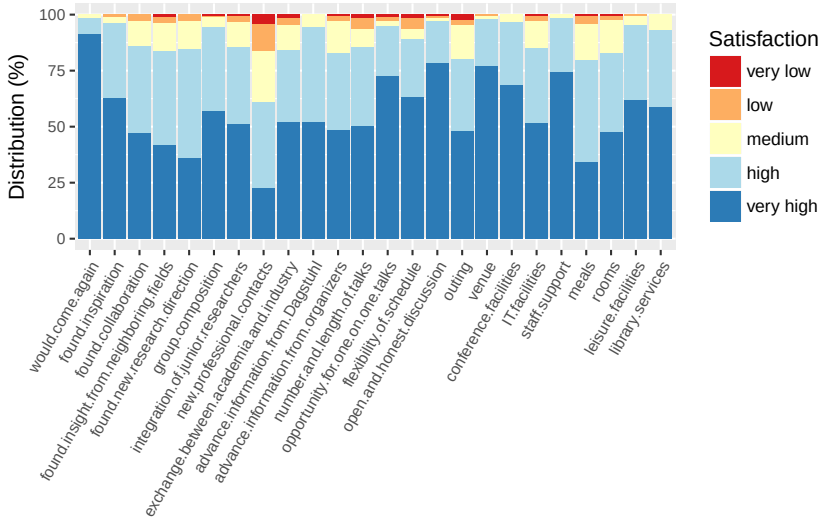
(c) Graphical distribution of seminar type A in 2014–2020 by year and region



(d) Graphical distribution of seminar type B in 2014–2020 by year and region

Fig. 13.9

Number of Dagstuhl guests by country of origin. A = Dagstuhl Seminar and Dagstuhl Perspectives Workshop participants, B = Participants in all other events (GI-Dagstuhl Seminars, educational events, and research group meetings).

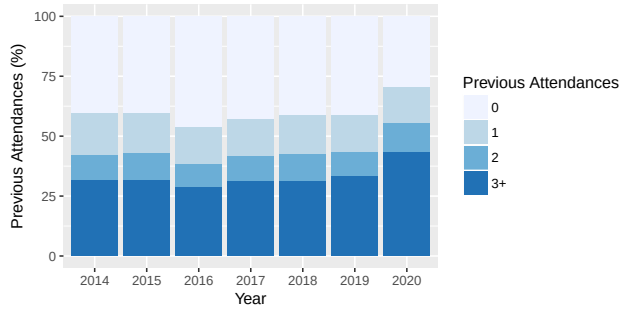


(a) Graphical distribution for 2020

	2014	2015	2016	2017	2018	2019	2020	2020 – Detailed Numbers					
	ø	ø	ø	ø	ø	ø	ø	1	2	3	4	5	total
would come again	4.9	4.9	4.9	4.9	4.9	4.9	4.9	0	0	3	15	193	211
found inspiration	4.4	4.5	4.5	4.5	4.6	4.6	4.6	0	2	6	72	137	217
found collaboration	4.1	4.1	4.1	4.2	4.2	4.3	4.3	0	6	24	83	102	215
found insight from neighboring fields	4.2	4.3	4.2	4.2	4.2	4.3	4.2	2	6	27	91	91	217
found new research direction	4.0	4.1	4.1	4.1	4.2	4.2	4.2	0	6	26	103	76	211
group composition	4.4	4.5	4.5	4.5	4.5	4.6	4.5	1	1	10	81	124	217
integration of junior researchers	4.2	4.2	4.3	4.3	4.3	4.3	4.3	1	6	24	75	111	217
new professional contacts	3.7	3.6	3.7	3.8	3.8	3.8	3.6	9	26	49	83	49	216
exchange between academia and industry	4.2	4.3	4.3	4.4	4.4	4.4	4.3	2	4	16	44	72	138
advance information from Dagstuhl	4.4	4.4	4.4	4.4	4.4	4.5	4.5	0	0	12	90	111	213
advance information from organizers	4.1	4.1	4.2	4.1	4.3	4.3	4.3	1	5	30	72	103	211
number and length of talks	4.1	4.2	4.3	4.2	4.3	4.3	4.3	3	10	16	73	103	205
opportunity for one on one talks	4.5	4.5	4.6	4.6	4.6	4.6	4.6	2	4	5	48	157	216
flexibility of schedule	4.3	4.3	4.4	4.3	4.3	4.5	4.4	3	11	9	57	137	217
open and honest discussion	4.7	4.7	4.7	4.7	4.7	4.7	4.7	1	2	3	41	170	217
outing	4.1	4.1	4.2	4.2	4.3	4.2	4.2	4	4	27	57	86	178
venue	4.7	4.7	4.7	4.7	4.7	4.7	4.7	0	1	3	45	166	215
conference facilities	4.7	4.6	4.7	4.7	4.7	4.7	4.7	0	0	7	60	149	216
IT facilities	4.4	4.3	4.4	4.3	4.4	4.4	4.3	1	4	23	63	98	189
staff support	4.7	4.7	4.7	4.7	4.8	4.8	4.7	0	0	3	50	156	209
meals	4.1	4.1	4.1	4.1	4.1	4.2	4.1	1	8	34	98	74	215
rooms	4.4	4.4	4.4	4.4	4.4	4.4	4.3	1	4	31	76	103	215
leisure facilities	4.6	4.6	4.5	4.5	4.6	4.6	4.6	0	1	8	66	122	197
library services	4.5	4.5	4.5	4.5	4.6	4.6	4.5	0	0	8	39	67	114

(b) Averages for 2014–2020 and detailed numbers for 2020: 1 = very low, 2 = low, 3 = medium, 4 = high, 5 = very high

Fig. 13.10
Satisfaction of Dagstuhl Seminar and Dagstuhl Perspectives Workshop participants, according to our guest survey.

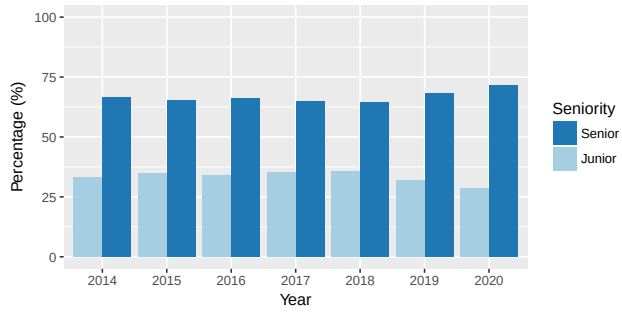


(a) Graphical distribution for 2014–2020

Year	Number of Previous Attendances								Total
	0		1		2		>2		
	#	%	#	%	#	%	#	%	#
2014	561	40	239	17	144	10	443	32	1387
2015	573	40	234	17	158	11	451	32	1416
2016	654	46	217	15	137	10	410	29	1418
2017	607	43	222	16	148	10	446	31	1423
2018	557	41	219	16	148	11	425	32	1349
2019	615	41	230	15	144	10	503	34	1492
2020	61	29	31	15	25	12	90	43	207

(b) Detailed numbers for 2014–2020

Fig. 13.11
Dagstuhl Seminar and Dagstuhl Perspectives Workshop participants and their previous instances of attendance in Dagstuhl Seminars or Dagstuhl Perspectives Workshops, according to our guest survey.

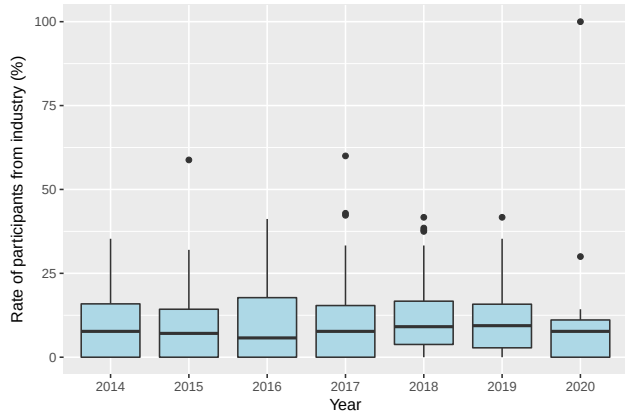


(a) Chart for 2014–2020

Year	Junior		Senior		Total
	#	%	#	%	#
2014	382	33.3	765	66.7	1147
2015	410	34.9	764	65.1	1174
2016	404	33.9	787	66.1	1191
2017	422	35.2	778	64.8	1200
2018	401	35.7	722	64.3	1123
2019	385	31.9	823	68.1	1208
2020	53	28.5	133	71.5	186

(b) Detailed numbers for 2014–2020

Fig. 13.12
Self-assigned seniority of Dagstuhl Seminar and Dagstuhl Perspectives Workshop participants, according to our guest survey.

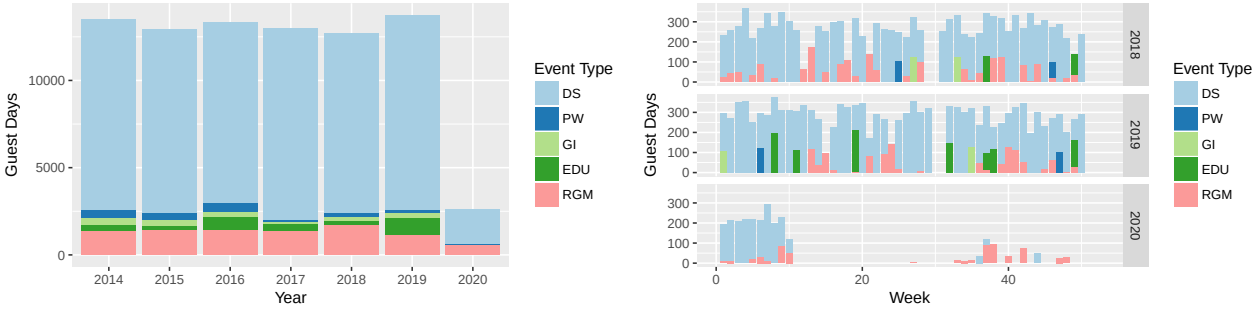


(a) Chart for 2014–2020

Year	Min (%)	Max (%)	Avg (%)	Std (%)
2014	0.0	35.3	9.4	9.4
2015	0.0	58.8	9.8	10.5
2016	0.0	41.2	10.3	11.0
2017	0.0	60.0	10.9	11.6
2018	0.0	41.7	11.1	10.4
2019	0.0	41.7	11.4	10.7
2020	0.0	100.0	14.6	25.9

(b) Detailed numbers for 2014–2020

Fig. 13.13
Distribution of the rate of participants with self-assigned primary occupation in business per Dagstuhl Seminar and Dagstuhl Perspectives Workshop in 2014–2020, according to our guest survey. Min = minimal value, Max = maximal value, Avg = average, Std = standard deviation. Occupation in business includes "industrial research", "industrial development", and "self employed".



(a) Chart for 2014–2020

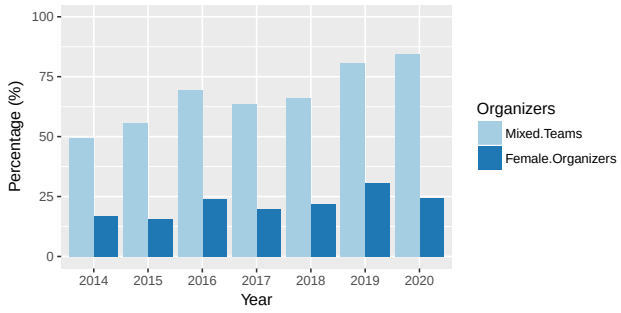
(b) Graphical distribution for 2018–2020 by week

Year	DS	PW	GI	EDU	RGM	Total
2014	10939	475	348	390	1370	13522
2015	10491	380	344	261	1424	12900
2016	10362	495	315	703	1462	13337
2017	10989	102	105	401	1391	12988
2018	10270	182	250	231	1740	12673
2019	11127	225	239	1004	1144	13739
2020	1984	0	0	0	614	2598

(c) Detailed numbers for 2014–2020

Fig. 13.14

Number of overnight stays at Schloss Dagstuhl. DS = Dagstuhl Seminar, PW = Dagstuhl Perspectives Workshop, GI = GI-Dagstuhl Seminar, EDU = educational event, RGM = research group meeting.



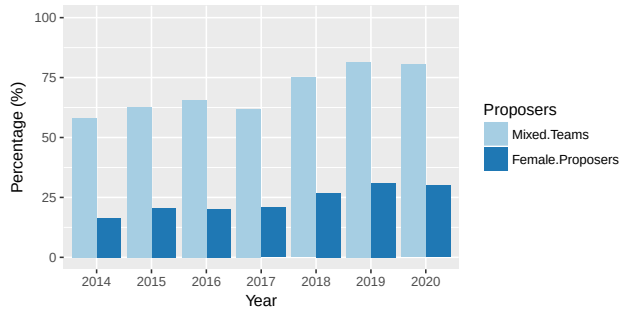
(a) Chart for 2014–2020

	Organizer Teams			Organizers		
Year	Total	Mixed		Total	Female	
	#	#	%	#	#	%
2014	75	37	49.3	303	51	16.8
2015	72	40	55.6	284	45	15.8
2016	72	50	69.4	278	67	24.1
2017	77	49	63.6	303	60	19.8
2018	65	43	66.2	259	57	22.0
2019	73	59	80.8	291	89	30.6
2020	13	11	84.6	53	13	24.5

(b) Detailed numbers for 2014–2020

Fig. 13.15

Dagstuhl Seminars and Dagstuhl Perspectives Workshops with mixed-gender organizer teams.

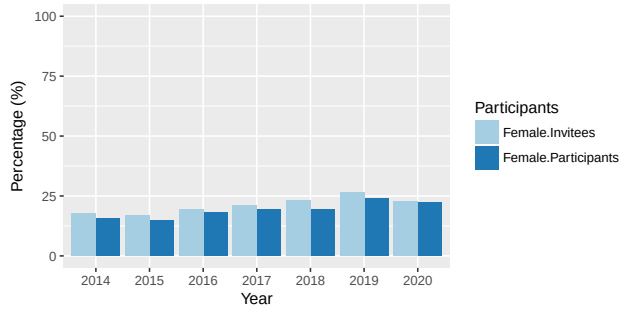


(a) Chart for 2014–2020

	Proposer Teams			Proposers		
Year	Total	Mixed		Total	Female	
	#	#	%	#	#	%
2014	98	57	58.2	387	64	16.5
2015	99	62	62.6	391	80	20.5
2016	125	82	65.6	491	99	20.2
2017	102	63	61.8	394	82	20.8
2018	136	102	75.0	522	140	26.8
2019	103	84	81.6	411	127	30.9
2020	153	123	80.4	593	178	30.0

(b) Detailed numbers for 2014–2020

Fig. 13.16
Dagstuhl Seminar and Dagstuhl Perspectives Workshop proposals with mixed-gender proposer teams.

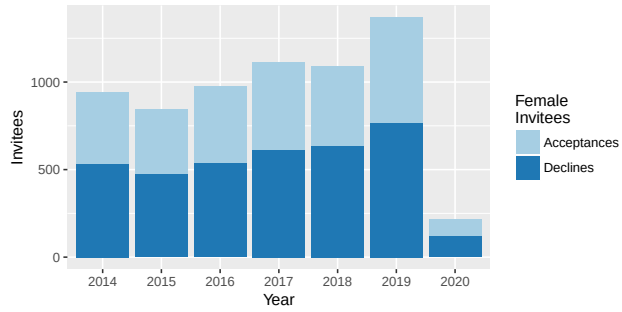


(a) Chart for 2014–2020

	Invitees			Participants		
Year	Total	Female		Total	Female	
	#	#	%	#	#	%
2014	5285	943	17.8	2590	406	15.7
2015	5023	845	16.8	2473	369	14.9
2016	5060	977	19.3	2393	437	18.3
2017	5267	1114	21.2	2572	497	19.3
2018	4692	1089	23.2	2320	455	19.6
2019	5143	1369	26.6	2498	603	24.1
2020	962	217	22.6	419	93	22.2

(b) Detailed numbers for 2014–2020

Fig. 13.17
Female invitees and participants in Dagstuhl Seminars and Dagstuhl Perspectives Workshops, by year.

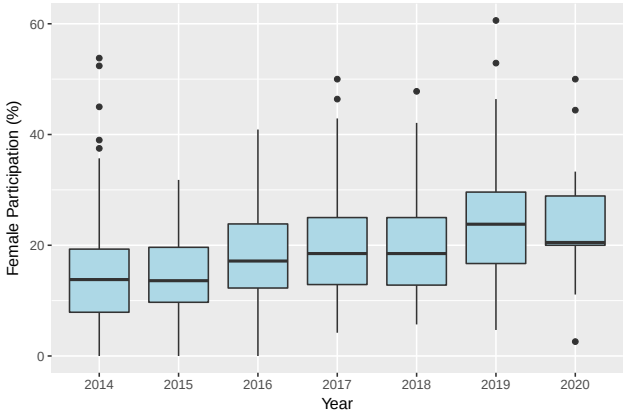


(a) Chart for 2014–2020

Year	Female Invitees	Acceptances		Declines	
	#	#	%	#	%
2014	943	406	43.1	537	56.9
2015	845	369	43.7	476	56.3
2016	977	437	44.7	540	55.3
2017	1114	497	44.6	617	55.4
2018	1089	455	41.8	634	58.2
2019	1369	603	44.0	766	56.0
2020	217	93	42.9	124	57.1

(b) Detailed numbers for 2014–2020

Fig. 13.18
Female invitees to Dagstuhl Seminar and Dagstuhl Perspectives Workshops.



(a) Chart for 2014–2020

Year	Min (%)	Max (%)	Avg (%)	Std (%)
2014	0.0	53.8	15.9	11.1
2015	0.0	31.8	14.8	7.7
2016	0.0	40.9	18.3	9.1
2017	4.2	50.0	19.8	9.8
2018	5.7	47.8	20.0	9.3
2019	4.7	60.6	24.6	10.6
2020	2.6	50.0	24.4	12.1

(b) Detailed numbers for 2014–2020

Fig. 13.19

Distribution of female participants rate per Dagstuhl Seminar or Dagstuhl Perspectives Workshop in 2014–2020. Min = minimal value, Max = maximal value, Avg = average, Std = standard deviation.

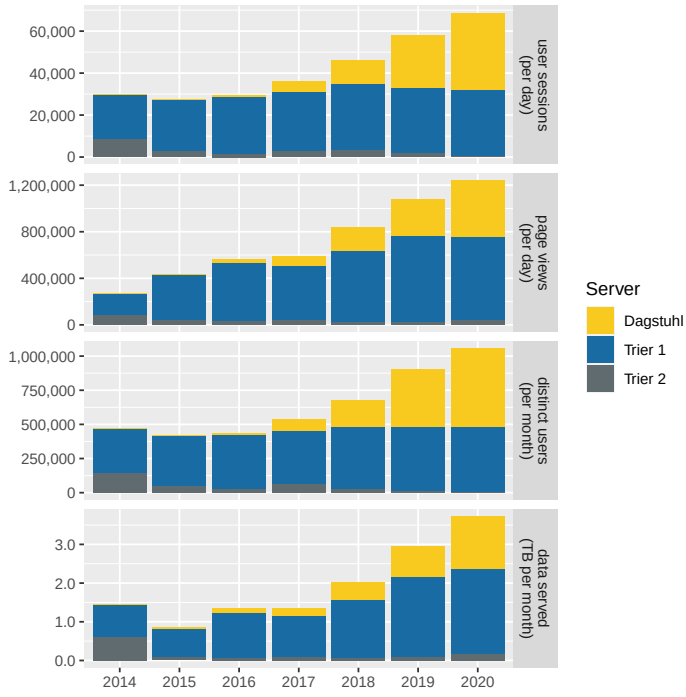
Statistiken zur Bibliographiedatenbank dblp

13.2

Statistics of the dblp computer science bibliography

Dieser Abschnitt enthält statistische Daten zur Bibliographiedatenbank dblp. Fig. 13.20 listet die durchschnittlichen Nutzungszahlen der letzten Jahre. Ein Überblick über die Entwicklung des dblp Datenbestandes kann Fig. 13.21 und Fig. 13.22 entnommen werden. Fig. 13.23–13.25 geben Auskunft über die kontinuierliche Datenkuration und -anreicherung des Bestandes.

This section provides statistical data about the dblp computer science bibliography. Fig. 13.20 shows the average usage statistics of the dblp servers in the past years. An overview of the development of the dblp database can be found in Fig. 13.21 and Fig. 13.22. Information about the continuous data curation and enrichment of existing records can be found in Fig. 13.23–13.25.



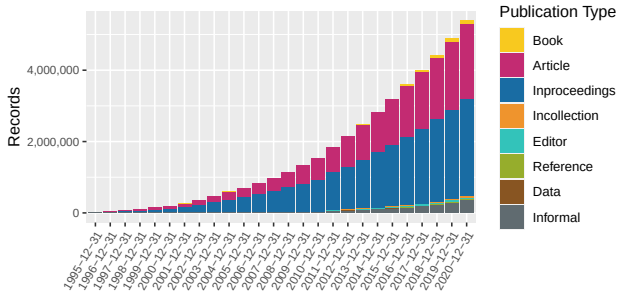
(a) Chart for 2014–2020

	Trier 1		Trier 2		Dagstuhl		Total		
	2019	2020	2019	2020	2019	2020	2019	2020	%
user sessions (visits) per day	31,024	31,450	1,808	414	24,994	36,849	57,827	68,715	+18.8
page views per day	735,190	712,228	22,761	40,523	326,053	486,166	1,084,005	1,238,918	+14.3
page views per user session	23.7	22.6	12.6	97.7	13.0	13.2	18.7	18.0	-3.8
distinct users (IPs) per month	466,015	473,014	12,963	4,433	424,106	578,492	903,085	1,055,941	+16.9
data served per month	2,114.1 GB	2,243.6 GB	89.6 GB	170.3 GB	821.3 GB	1,402.1 GB	3,025.0 GB	3,816.0 GB	+26.1

(b) Detailed numbers for the past two years

Fig. 13.20

Average usage of the three dblp servers. Trier 1 = dblp.uni-trier.de, Trier 2 = dblp2.uni-trier.de, Dagstuhl = dblp.dagstuhl.de. All figures exclude traffic caused by recognized bots and web crawlers. Usage data has not been collected before 2014. In 2015, changes have been made in the server setup in order to shift traffic from development server Trier 2 to the more powerful server Trier 1. Since 2017, server Dagstuhl has been promoted to play a more prominent role under the domain dblp.org.

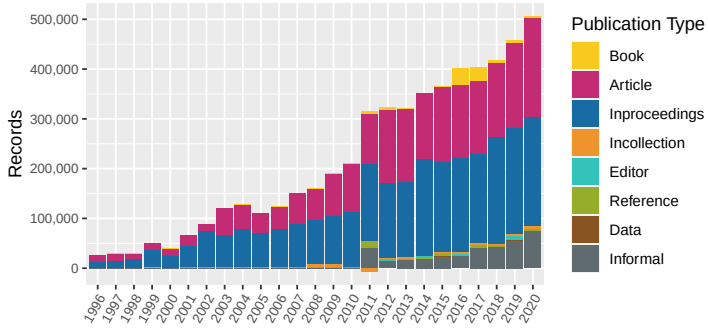


(a) Chart for 1996–2020

Year	Book		Article		Inproceedings		Incollection		Editor		Reference		Data		Informal		Total
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#
2014	17,533	0.6	1,129,231	39.8	1,545,065	54.5	14,470	0.5	26,137	0.9	14,690	0.5	0	0.0	88,217	3.1	2,835,343
2015	18,318	0.6	1,281,245	40.0	1,724,262	53.9	16,288	0.5	30,044	0.9	19,103	0.6	12	0.0	110,974	3.5	3,200,246
2016	51,070	1.4	1,429,427	39.7	1,912,895	53.1	19,774	0.5	33,782	0.9	20,174	0.6	26	0.0	134,354	3.7	3,601,502
2017	77,408	1.9	1,576,972	39.4	2,091,486	52.2	23,101	0.6	37,049	0.9	23,089	0.6	49	0.0	174,723	4.4	4,003,877
2018	83,249	1.9	1,725,704	39.0	2,306,585	52.2	24,708	0.6	40,795	0.9	23,150	0.5	514	0.0	216,984	4.9	4,421,689
2019	90,826	1.9	1,896,014	38.8	2,518,298	51.6	30,457	0.6	44,898	0.9	26,997	0.6	1,402	0.0	271,633	5.6	4,880,525
2020	95,442	1.8	2,096,005	38.9	2,735,716	50.8	36,372	0.7	48,481	0.9	27,321	0.5	2,230	0.0	345,676	6.4	5,387,243

(b) Detailed numbers for 2014–2020

Fig. 13.21
Development of the total size of the dblp database.

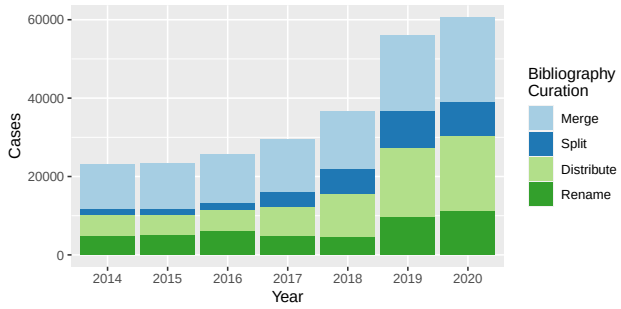


(a) Chart for 1996–2020

Year	Book		Article		Inproceedings		Incollection		Editor		Reference		Data		Informal		Total
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#
2014	714	0.2	131,411	37.4	194,352	55.3	1,673	0.5	3,366	1.0	1,565	0.4	0	0.0	18,312	5.2	351,393
2015	785	0.2	152,014	41.7	179,197	49.1	1,818	0.5	3,907	1.1	4,413	1.2	12	0.0	22,757	6.2	364,903
2016	32,752	8.2	148,182	36.9	188,633	47.0	3,486	0.9	3,738	0.9	1,071	0.3	14	0.0	23,380	5.8	401,256
2017	26,338	6.5	147,545	36.7	178,591	44.4	3,327	0.8	3,267	0.8	2,915	0.7	23	0.0	40,369	10.0	402,375
2018	5,841	1.4	148,732	35.6	215,099	51.5	1,607	0.4	3,746	0.9	61	0.0	465	0.1	42,261	10.1	417,812
2019	7,577	1.7	170,310	37.1	211,713	46.1	5,749	1.3	4,103	0.9	3,847	0.8	888	0.2	54,649	11.9	458,836
2020	4,616	0.9	199,991	39.5	217,418	42.9	5,915	1.2	3,583	0.7	324	0.1	828	0.2	74,043	14.6	506,718

(b) Detailed numbers for 2014–2020

Fig. 13.22
Development of newly included publications in dblp. The negative number of new *Incollection* records in 2011 results from relabeling several thousand existing records with the newly introduced *Reference* type. Similarly, in the same year, several thousand *Articles* and *Inproceedings* records have been labeled as *Informal*.



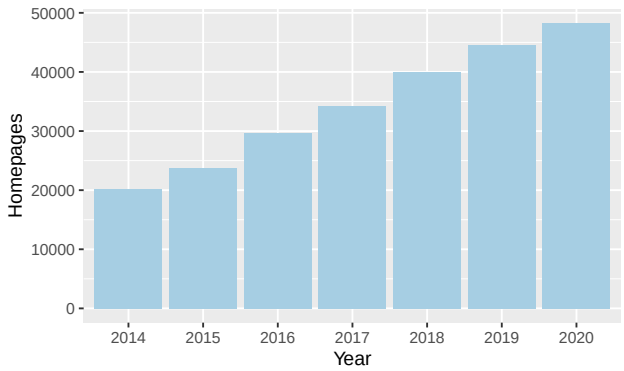
(a) Chart for 2014–2020

Year	Merge		Split		Distribute		Rename		Total
	#	%	#	%	#	%	#	%	#
2014	11,564	50.0	1,382	6.0	5,410	23.4	4,768	20.6	23,124
2015	11,526	49.6	1,495	6.4	5,323	22.9	4,876	21.0	23,220
2016	12,426	48.4	1,913	7.5	5,310	20.7	5,999	23.4	25,648
2017	13,537	46.0	3,660	12.4	7,465	25.3	4,786	16.3	29,448
2018	14,906	40.6	6,282	17.1	11,014	30.0	4,524	12.3	36,726
2019	19,595	34.9	9,192	16.4	17,795	31.7	9,562	17.0	56,144
2020	21,636	35.7	8,606	14.2	19,326	31.9	11,083	18.3	60,651

(b) Detailed numbers for 2014–2020

Fig. 13.23

Curation of existing dblp author bibliographies. The figures give the number of distinct edit cases (measured between the first and the last day of every given year) where a dblp team member manually corrected the assignment of publications within dblp author bibliographies. We distinguish between four curation cases: *Merge* = Two or more synonymous bibliographies have been merged into a single bibliography. *Split* = A single, homonymous bibliography has been split into two or more bibliographies. *Distribute* = A mixed case where records from two or more bibliographies have been redistributed between two or more bibliographies. *Rename* = A case where no actual publications have been reassigned, but the surface form of the author name(s) of a bibliography have been corrected or improved. These figures correct flawed figures given in earlier reports.



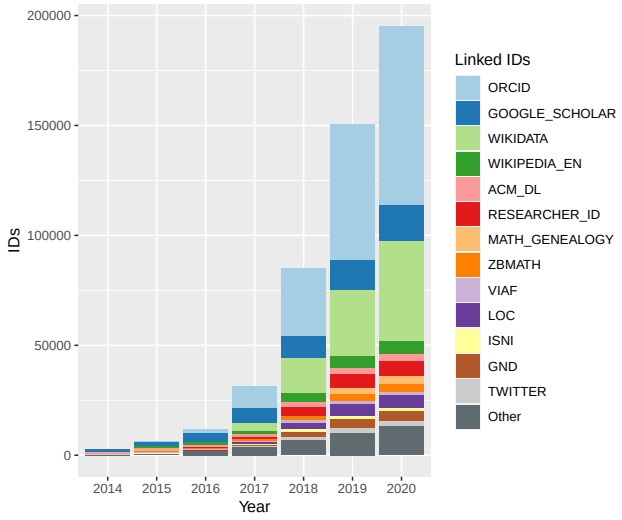
(a) Chart for 2014–2020

Year	Homepages
2014	20,176
2015	23,698
2016	29,642
2017	34,295
2018	40,046
2019	44,562
2020	48,265

(b) Detailed numbers for 2014–2020

Fig. 13.24

Linked and verified academic homepages in dblp author bibliographies. A single author bibliography may be linked to multiple academic homepages. These figures exclude linked external IDs which are given in Figure 13.25.



(a) Chart for 2014–2020

Year	ORCID		Google Scholar		Wikidata		Wikipedia (en)		ACM DL		ResearcherID		Math Genealogy	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%
2014	21	0.8	1,141	43.9	0	0.0	245	9.4	1,049	40.3	7	0.3	1	0.0
2015	73	1.2	2,125	34.2	0	0.0	902	14.5	1,095	17.6	28	0.5	7	0.1
2016	1,420	12.2	4,522	38.9	4	0.0	1,103	9.5	1,107	9.5	130	1.1	84	0.7
2017	10,342	32.8	6,608	21.0	3,588	11.4	1,376	4.4	1,277	4.1	1,049	3.3	5	0.0
2018	30,939	36.4	10,182	12.0	15,565	18.3	4,366	5.1	2,144	2.5	3,980	4.7	65	0.1
2019	61,976	41.1	13,726	9.1	30,022	19.9	5,547	3.7	2,448	1.6	6,192	4.1	3,071	2.0
2020	81,675	41.8	16,338	8.4	45,216	23.1	6,275	3.2	3,166	1.6	6,855	3.5	3,590	1.8

Year	Zentralblatt MATH		VIAF		LOC		ISNI		GND		Twitter		Other		Total
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#
2014	3	0.1	2	0.1	0	0.0	1	0.0	0	0.0	12	0.5	119	4.6	2,601
2015	568	9.2	516	8.3	324	5.2	1	0.0	217	3.5	62	1.0	287	4.6	6,205
2016	633	5.5	526	4.5	324	2.8	7	0.1	220	1.9	161	1.4	1,371	11.8	11,612
2017	646	2.1	840	2.7	602	1.9	606	1.9	430	1.4	392	1.2	3,741	11.9	31,502
2018	2,145	2.5	938	1.1	2,862	3.4	1,231	1.4	2,385	2.8	1,567	1.8	6,662	7.8	85,031
2019	3,363	2.2	1,060	0.7	5,680	3.8	1,383	0.9	3,782	2.5	2,183	1.4	10,218	6.8	150,651
2020	3,607	1.8	1,061	0.5	6,289	3.2	1,385	0.7	4,241	2.2	2,613	1.3	13,011	6.7	195,322

(b) Detailed numbers for 2014–2020

Fig. 13.25
Linked and verified external person IDs in dblp author bibliographies. A single bibliography may be linked to multiple external IDs.

Statistiken zu Dagstuhl Publishing

Dieser Abschnitt enthält statistische Daten zum Publikationswesen von Schloss Dagstuhl.

Ein Überblick über die Entwicklung der seminarbezogenen Veröffentlichungen kann den ersten drei Diagrammen und Tabellen entnommen werden. Fig. 13.26 fasst die statistischen Daten der Veröffentlichungen in der Zeitschrift Dagstuhl Reports zusammen, Fig. 13.27 die der Publikationen in der Reihe Dagstuhl Manifestos und schließlich Fig. 13.28 die der veröffentlichten Bände in der Reihe Dagstuhl Follow-Ups.

Die statistischen Daten zu den dienstleistungsbezogenen Veröffentlichungen finden sich anschließend: Fig. 13.29 fasst die Daten in der Reihe OASIcs und Fig. 13.30 die der Reihe LIPIcs zusammen.

Die Kennzahlen der Zeitschrift LITES können Fig. 13.31 entnommen werden.

Die verschiedenen Publikationsserien wurden in unterschiedlichen Jahren zwischen 2009 und 2015 gegründet. Wir stellen in den Statistiken dennoch stets den gesamten Zeitraum (2014–2020) dar.

13.3 Statistics of Dagstuhl Publishing

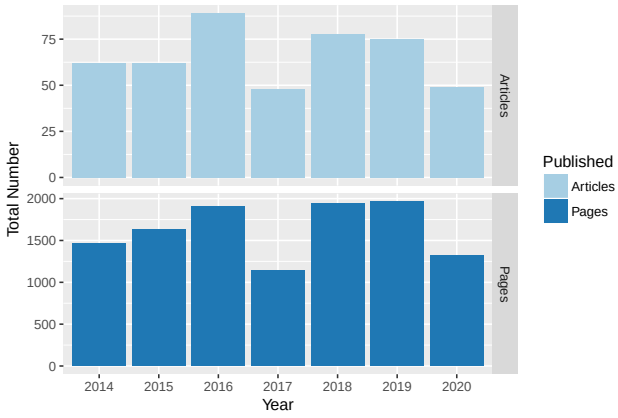
In this section the statistical data of Dagstuhl Publishing are presented.

The first three figures present the development of the seminar-focused series: Fig. 13.26 summarizes the data of the periodical Dagstuhl Reports, Fig. 13.27 the data of the Dagstuhl Manifestos series, and, finally, Fig. 13.28 that of the volumes published in the Dagstuhl Follow-Ups series.

The statistical data of the service-focused series are presented afterwards. Fig. 13.29 presents numbers related to OASIcs and Fig. 13.30 numbers related to LIPIcs.

We summarize the publications of the journal LITES in Fig. 13.31.

Please note that the publication series were established in different years in the period between 2009 and 2015. However, we always consider this complete period (2014–2020).

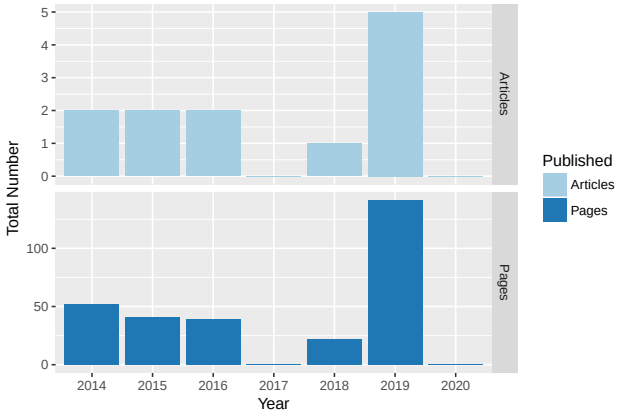


(a) Graphical distribution for 2014–2020

Year	Articles	Pages
2014	62	1464
2015	62	1636
2016	89	1910
2017	48	1138
2018	78	1938
2019	75	1961
2020	49	1322

(b) Detailed numbers for 2014–2020

Fig. 13.26
Statistics about Dagstuhl Reports published between 2014 to 2020.

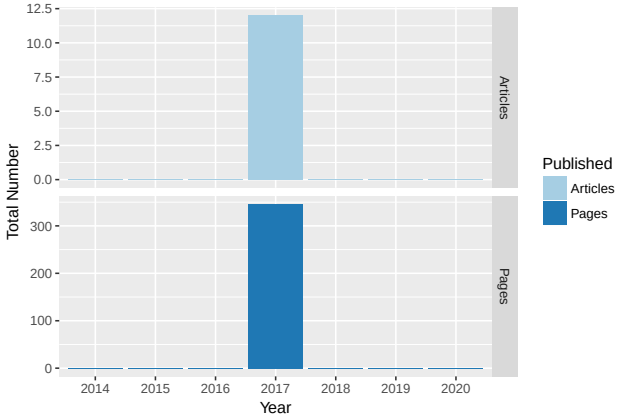


(a) Graphical distribution for 2014–2020

Year	Articles	Pages
2014	2	52
2015	2	41
2016	2	39
2017	0	0
2018	1	22
2019	5	141
2020	0	0

(b) Detailed numbers for 2014–2020

Fig. 13.27
Statistics about Dagstuhl Manifestos published between 2014 to 2020.

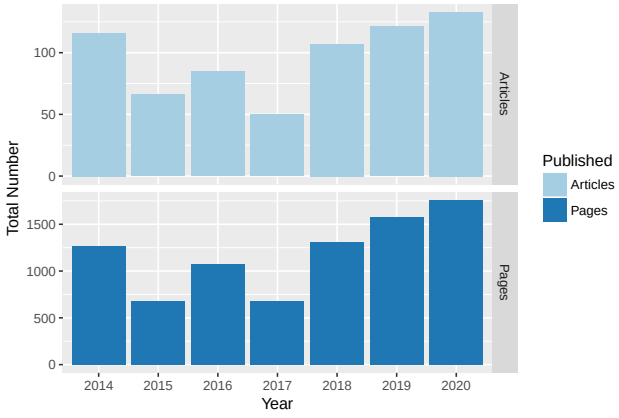


(a) Graphical distribution for 2014–2020

Year	Volumes	Articles	Pages
2014	0	0	0
2015	0	0	0
2016	0	0	0
2017	1	12	346
2018	0	0	0
2019	0	0	0
2020	0	0	0

(b) Detailed numbers for 2014–2020

Fig. 13.28
Statistics about Dagstuhl Follow-Ups volumes published between 2014 to 2020.

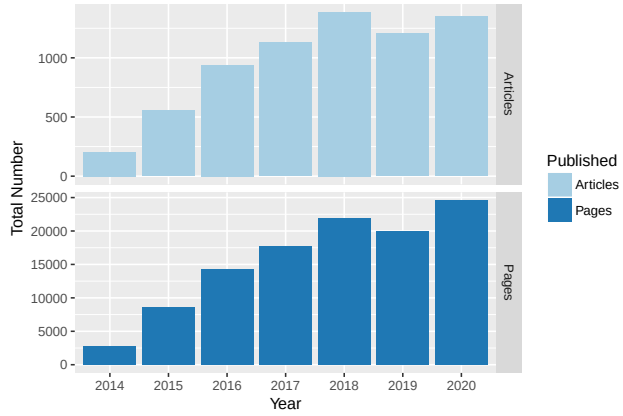


(a) Graphical distribution for 2014–2020

Year	Volumes	Articles	Pages
2014	8	116	1264
2015	6	66	674
2016	6	85	1078
2017	3	50	684
2018	7	107	1312
2019	9	121	1576
2020	11	133	1754

(b) Detailed numbers for 2014–2020

Fig. 13.29
Statistics about OASIcs volumes published between 2014 to 2020.

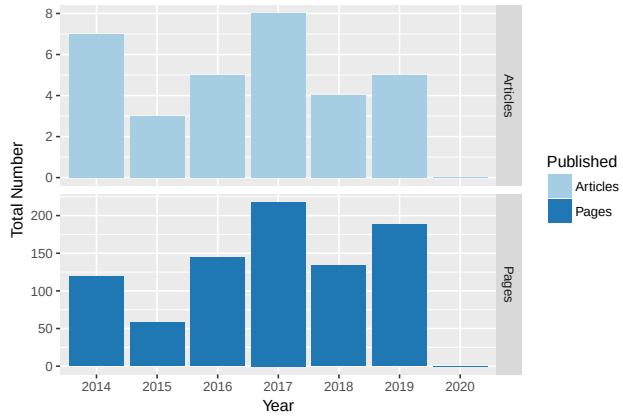


(a) Graphical distribution for 2014–2020

Year	Volumes	Articles	Pages
2014	5	204	2752
2015	16	553	8565
2016	19	939	14222
2017	25	1127	17687
2018	32	1387	21871
2019	29	1208	20032
2020	32	1351	24546

(b) Detailed numbers for 2014–2020

Fig. 13.30
Statistics about LIPIcs volumes published between 2014 to 2020.

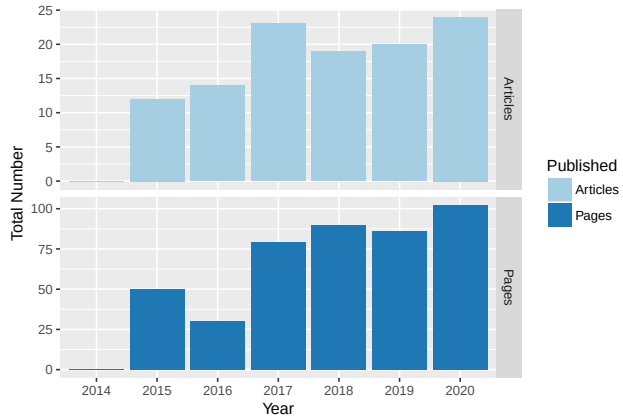


(a) Graphical distribution for 2014–2020

Year	Articles	Pages
2014	7	119
2015	3	58
2016	5	144
2017	8	218
2018	4	134
2019	5	188
2020	0	0

(b) Detailed numbers for 2014–2020

Fig. 13.31
Statistics about LITES articles published between 2014 to 2020.



(a) Graphical distribution for 2014–2020

Year	Articles	Pages
2014	0	0
2015	12	50
2016	14	30
2017	23	79
2018	19	90
2019	20	86
2020	24	102

(b) Detailed numbers for 2014–2020

Fig. 13.32
Statistics about DARTS artifacts published between 2014 to 2020.

14 Veranstaltungen 2020
Schedule of Events 2020

Dagstuhl-Seminare 14.1 *Dagstuhl Seminars*

20021 – Spoken Language Interaction with Virtual Agents and Robots (SLIVAR): Towards Effective and Ethical Interaction
Laurence Devillers (CNRS – Orsay, FR), Tatsuya Kawahara (Kyoto University, JP), Roger K. Moore (University of Sheffield, GB), Matthias Scheutz (Tufts University – Medford, US)
January 5–10, 2020 | Dagstuhl Seminar | https://www.dagstuhl.de/20021

20031 – Scalability in Multiobjective Optimization
Carlos M. Fonseca (University of Coimbra, PT), Kathrin Klamroth (Universität Wuppertal, DE), Günter Rudolph (TU Dortmund, DE), Margaret M. Wiecek (Clemson University, US)
January 12–17, 2020 | Dagstuhl Seminar | https://www.dagstuhl.de/20031

20041 – Symmetric Cryptography
Nils Gregor Leander (Ruhr-Universität Bochum, DE), Bart Mennink (Radboud University Nijmegen, NL), Kaisa Nyberg (Aalto University, FI), Kan Yasuda (NTT – Tokyo, JP)
January 19–24, 2020 | Dagstuhl Seminar | https://www.dagstuhl.de/20041

20051 – Computational Metabolomics: From Cheminformatics to Machine Learning
Sebastian Böcker (Universität Jena, DE), Corey Broeckling (Colorado State University – Fort Collins, US), Emma Schymanski (University of Luxembourg, LU), Nicola Zamboni (ETH Zürich, CH)
January 26–31, 2020 | Dagstuhl Seminar | https://www.dagstuhl.de/20051

20061 – SAT and Interactions
Olaf Beyersdorff (Universität Jena, DE), Uwe Egly (TU Wien, AT), Meena Mahajan (Institute of Mathematical Sciences – Chennai, IN), Claudia Nalon (University of Brasilia, BR)
February 2–7, 2020 | Dagstuhl Seminar | https://www.dagstuhl.de/20061

20071 – Foundations of Composite Event Recognition
Alexander Artikis (NCSR Demokritos – Athens, GR), Thomas Eiter (TU Wien, AT), Alessandro Margara (Polytechnic University of Milan, IT), Stijn Vansummeren (Free University of Brussels, BE)
February 9–14, 2020 | Dagstuhl Seminar | https://www.dagstuhl.de/20071

20081 – Scheduling
Nicole Megow (Universität Bremen, DE), David Shmoys (Cornell University – Ithaca, US), Ola Svensson (EPFL – Lausanne, CH)
February 16–21, 2020 | Dagstuhl Seminar | https://www.dagstuhl.de/20081

20091 – SE4ML – Software Engineering for AI-ML-based Systems
Kristian Kersting (TU Darmstadt, DE), Miryung Kim (UCLA, US), Guy Van den Broeck (UCLA, US), Thomas Zimmermann (Microsoft Corporation – Redmond, US)
February 23–28, 2020 | Dagstuhl Seminar | https://www.dagstuhl.de/20091

20101 – Resiliency in Numerical Algorithm Design for Extreme Scale Simulations
Luc Giraud (INRIA – Bordeaux, FR), Ulrich Rüde (Universität Erlangen-Nürnberg, DE), Linda Stals (Australian National University – Canberra, AU)
March 1–6, 2020 | Dagstuhl Seminar | https://www.dagstuhl.de/20101

20111 – Tensor Computations: Applications and Optimization
Paolo Bientinesi (University of Umeå, SE), David Ham (Imperial College London, GB), Furong Huang (University of Maryland – College Park, US), Paul H. J. Kelly (Imperial College London, GB), Christian Lengauer (Köln, DE), P. (Saday) Sadayappan (University of Utah – Salt Lake City, US)
March 8–13, 2020 | Dagstuhl Seminar | https://www.dagstuhl.de/20111

20372 – Beyond Adaptation: Understanding Distributional Changes
Niall Adams (Imperial College London, GB), Vera Hofer (Universität Graz, AT), Eyke Hüllermeier (Universität Paderborn, DE), Georg Krempl (Utrecht University, NL), Geoffrey Webb (Monash University – Clayton, AU)
September 6–11, 2020 | Dagstuhl Seminar | https://www.dagstuhl.de/20372

20382 – Interactive Visualization for Fostering Trust in AI
Polo Chau (Georgia Institute of Technology – Atlanta, US), Alex Endert (Georgia Institute of Technology – Atlanta, US), Daniel A. Keim (Universität Konstanz, DE), Daniela Oelke (Hochschule Offenburg, DE)
September 13–16, 2020 | Dagstuhl Seminar | https://www.dagstuhl.de/20382

20452 – Decision-Making Modeling and Solutions for Smart Semiconductor Manufacturing
Chen-Fu Chien (National Tsing Hua University – Hsinchu, TW), Hans Ehm (Infineon Technologies – München, DE), John Fowler (Arizona State University – Tempe, US), Lars Mönch (FernUniversität in Hagen, DE)
November 1–5, 2020 | Dagstuhl Seminar | https://www.dagstuhl.de/20452

Dagstuhl-Perspektiven-Workshops 14.2 *Dagstuhl Perspectives Workshops*

There were no such meetings in 2020.

GI-Dagstuhl-Seminare 14.3 *GI-Dagstuhl Seminars*

There were no such meetings in 2020.

Lehrveranstaltungen 14.4 *Educational Events*

There were no such meetings in 2020.

Forschungsgruppentreffen 14.5 *Research Group Meetings*

20023 – Klausurtagung des Forschungsprojekts ContinulTy: "Automated Performance Testing in Continuous Software Engineering"
Stefan Siegl (NovaTec Holding – Leinfelden-Echterdingen, DE), André van Hoorn (Universität Stuttgart, DE)
January 8–10, 2020 | Research Group Meeting | https://www.dagstuhl.de/20023

20033 – SE-Treffen des GI Fachbereichs
Bernhard Rumpe (RWTH Aachen, DE)
January 15–16, 2020 | Research Group Meeting | https://www.dagstuhl.de/20033

20063 – Klausurtagung "KI Methoden und Anwendungen"
Klaus-Peter Scherer (KIT – Karlsruher Institut für Technologie, DE)
February 5–7, 2020 | Research Group Meeting | https://www.dagstuhl.de/20063

20064 – Initiationstreffen Forschungsprojekt
Lukas Reuter (Universität Trier, DE), Ingo Timm (Universität Trier, DE)
February 5–7, 2020 | Research Group Meeting | https://www.dagstuhl.de/20064

20073 – Lehrstuhltreffen Hanebeck
Uwe D. Hanebeck (KIT – Karlsruher Institut für Technologie, DE), Florian Pfaff (KIT – Karlsruher Institut für Technologie, DE)
February 12–14, 2020 | Research Group Meeting | https://www.dagstuhl.de/20073

20083 – Arbeitstreffen Complexity of Infinite-Dimensional Problems
Michael Gnewuch (Universität Osnabrück, DE), Aicke Hinrichs (Johannes Kepler Universität Linz, AT), Klaus Ritter (TU Kaiserslautern, DE)
February 16–21, 2020 | Research Group Meeting | https://www.dagstuhl.de/20083

20103 – Software Engineering Forschungsmethoden Training
Sven Apel (Universität des Saarlandes – Saarbrücken, DE), Eric Bodden (Universität Paderborn, DE), Lars Grunske (HU Berlin, DE)
March 1–4, 2020 | Research Group Meeting | https://www.dagstuhl.de/20103

20104 – City 5.0-Seminar
Armin Stein (Universität Münster, DE)
March 4–6, 2020 | Research Group Meeting | https://www.dagstuhl.de/20104

20113 – Klausurtagung "AG Finkbeiner"
Bernd Finkbeiner (Universität des Saarlandes – Saarbrücken, DE)
March 11–13, 2020 | Research Group Meeting | https://www.dagstuhl.de/20113

20114 – Klausurtagung Telematik Karlsruhe
Robert Bauer (KIT – Karlsruher Institut für Technologie, DE), Martina Zitterbart (KIT – Karlsruher Institut für Technologie, DE)
March 11–13, 2020 | Research Group Meeting | https://www.dagstuhl.de/20114

20289 – Forschungsaufenthalt
Friedrich Steimann (Fernuniversität in Hagen, DE)
July 9–13, 2020 | Research Group Meeting | https://www.dagstuhl.de/20289

20343 – Software Language Engineering Body of Knowledge (SLEBoK) Recap
Friedrich Steimann (Fernuniversität in Hagen, DE)
August 17–21, 2020 | Research Group Meeting | https://www.dagstuhl.de/20343

20353 – Designing Experiments With the Age Simulator GERT and Wearables
Ingo Timm (Universität Trier, DE)
August 24–26, 2020 | Research Group Meeting | https://www.dagstuhl.de/20353

20363 – Lehrstuhltreffen Rechtsinformatik
Christoph Sorge (Universität des Saarlandes, DE)
August 31 to September 4, 2020 | Research Group Meeting | https://www.dagstuhl.de/20363

20383 – Projekt-Treffen "Anwendungen Formaler Wissenschaften"
Bernhard Ganter (TU Dresden, DE), Anatol Reibold (von Vicht GmbH, DE), Karl Erich Wolff (Ernst-Schröder-Zentrum Darmstadt, DE)
September 16–18, 2020 | Research Group Meeting | https://www.dagstuhl.de/20383

20385 – Algebraic and Other Aspects of Complexity Theory
Markus Bläser (Universität des Saarlandes – Saarbrücken, DE), Jacobo Torán (Universität Ulm, DE)
September 13–18, 2020 | Research Group Meeting | https://www.dagstuhl.de/20385

20394 – Mathematical Foundations of Dynamic Nash Flows
Tobias Harks (Universität Augsburg, DE), Britta Peis (RWTH Aachen, DE), Laura Vargas Koch (RWTH Aachen, DE)
September 20–25, 2020 | Research Group Meeting | https://www.dagstuhl.de/20394

20414 – Klausurtagung ISTE SQA
Steffen Becker (Universität Stuttgart, DE), André van Hoorn (Universität Stuttgart, DE)
October 6–8, 2020 | Research Group Meeting | https://www.dagstuhl.de/20414

20415 – New Results in Text Algorithmics and Combinatorics on Strings
Johannes Fischer (TU Dortmund, DE)
October 5–8, 2020 | Research Group Meeting | https://www.dagstuhl.de/20415

20433 – Workshop Process Mining
Wil van der Aalst (RWTH Aachen, DE)
October 18–21, 2020 | Research Group Meeting | https://www.dagstuhl.de/20433

20434 – Klausurtagung AG Robotersysteme, TUK
Karsten Berns (TU Kaiserslautern, DE)
October 22–23, 2020 | Research Group Meeting | https://www.dagstuhl.de/20434

20483 – Moderne Aspekte der Komplexitätstheorie in der Automatentheorie
Volker Diekert (Universität Stuttgart, DE), Henning Fernau (Universität Trier, DE), Petra Wolf (Universität Trier, DE)
November 22–27, 2020 | Research Group Meeting | https://www.dagstuhl.de/20483

20489 – Forschungsaufenthalt
Friedrich Steimann (Fernuniversität in Hagen, DE)
November 23–27, 2020 | Research Group Meeting | https://www.dagstuhl.de/20489

20493 – Reachability Analysis for Stochastic Hybrid Systems
Erika Abraham (RWTH Aachen University, DE), Anne Remke (Universität Münster, DE)
December 1–4, 2020 | Research Group Meeting | https://www.dagstuhl.de/20493

Leibniz
Gemeinschaft

Oktavie-Allee, 66687 Wadern, Deutschland

Jahresbericht / Annual Report 2020 | ISSN 2199-1995
http://www.dagstuhl.de