OASIcs – OpenAccess Series in Informatics

OASIcs aims at a suitable publication venue to publish peer-reviewed collections of papers emerging from a scientific event. OASIcs volumes are published according to the principle of Open Access, i.e., they are available online and free of charge.

Editorial Board

- Daniel Cremers (TU München, Germany)
- Barbara Hammer (Universität Bielefeld, Germany)
- Marc Langheinrich (Università della Svizzera Italiana – Lugano, Switzerland)
- Dorothea Wagner (Editor-in-Chief, Karlsruher Institut für Technologie, Germany)

ISSN 2190-6807

www.dagstuhl.de/oasics
## Contents

### Keynotes

Google and Open Source  
*Chris DiBona* ................................................................. 1

Going Beyond Fact-based Question Answering  
*Erik T. Mueller* ................................................................. 2

### Regular Papers

Language Run-time Systems: an Overview  
*Evgenij Belikov* ................................................................. 3

Affective Computing to Enhance E-Learning in Segregated Societies  
*Khaled El-Abbasy, Anastassia Angelopoulou, and Tony Towell* ................................................................. 13

Mining Scientific Articles Powered by Machine Learning Techniques  
*Carlos A. S. J. Gulo, Thiago R. P. M. Rúbio, Shazia Tabassum, and Simone G. D. Prado* ................................................................. 21

Computing Argumentation with Matrices  
*Evgenios Hadjisoteriou* ................................................................. 29

A Survey of CUDA-based Multidimensional Scaling on GPU Architecture  
*Hasnik Osipyan, Martin Kruliš, and Stéphane Marchand-Maillet* ................................................................. 37

Modelling SO-CAL in an Inheritance-based Sentiment Analysis Framework  
*F. Sharmila Satthar* ................................................................. 46

Interactive 3D Reconstruction: New Opportunities for Getting CAD-ready Models  
*Julius Schöning* ................................................................. 54

Representing Temporal Patterns in Computer-interpretable Clinical Guidelines  
*António Silva, Tiago Oliveira, Paulo Novais, and José Neves* ................................................................. 62

Hunt for the Collapse of Semantics in Infinite Abstract Argumentation Frameworks  
*Christof Spanring* ................................................................. 70

Checking WECTLK Properties of TRWISs via SMT-based Bounded Model Checking  
*Agnieszka M. Zbrzegn and Andrzei Zbrzegny* ................................................................. 78

Automatic Transformation of Raw Clinical Data Into Clean Data Using Decision Tree Learning Combining with String Similarity Algorithm  
*Jian Zhang* ................................................................. 87
Preface

Welcome to the 2015 Imperial College Computing Student Workshop (ICCSW’15), the fifth workshop in its series. ICCSW was initiated with a “by students, for students” spirit: a workshop organised solely by students to give student speakers the opportunity to present their work. The organising students gain the valuable experience of what is involved in conference organisation, including writing a call for sponsors, taking part in the reviewing process, and chairing a session. On the other hand, the participating students benefit from the interaction with international researchers who are at a similar stage in their career and developing skills in presenting their research to a non-specialist computer science audience.

This year’s Imperial College Computing Student Workshop was organised by the Imperial College ACM Student Chapter closely following the “by students, for students” spirit. As in previous years, a unique reviewing model was adopted, where in addition to members of the Imperial College ACM Student Chapter all authors were involved in the reviewing process. Furthermore, we reached out to students at a variety of European universities to act as “ambassadors” for ICCSW’15 by spreading the word about the workshop.

This volume contains the papers accepted for presentation at the 2015 Imperial College Computing Student Workshop. ICCSW’15 received 18 submissions from 10 different countries across two different tracks: the traditional paper track including technical and tool papers, and a survey track. After the thorough reviewing process and discussion by members of the Imperial College ACM Student Chapter 11 papers were accepted, representing a 61% acceptance rate which is in line with previous years.

In addition to the regular presentations of accepted papers, we are pleased to welcome two prominent keynote speakers to ICCSW’15:

- “Google and Open Source” by Chris DiBona, Director of Open Source at Google
- “Going Beyond Fact-based Question Answering” by Erik Mueller, researcher at MIT and member of the IBM team that developed the Watson Jeopardy! system.

On behalf of the organising committee, we wish to thank all authors, accepted or not, as well as our ambassadors, who acted as reviewers in our unique peer review process and promoted ICCSW’15 respectively. Furthermore, we also wish to thank our sponsors: Google, for their platinum-level sponsorship, who have supported ICCSW since its inception in 2011; and ARM, for their bronze-level sponsorship. Without the support of our sponsors, ICCSW’15 would not have been possible. Our thanks also goes to Imperial College London, and in particular the Department of Computing, who provided us with invaluable support in organising ICCSW’15.

Claudia Schulz and Daniel Liew
ICCSW’15 Editors
Conference Organisation

Organising Committee

Kristijonas Ėlynas  
Casper da Costa-Luís  
Martin Ingram  
Bertan Kavuncu  
Daniel Liew  
Luo Mai  
Pedro Martinez Mediano  
Feryal Mehraban Pour Behbahani  
Kyriacos Nikiforou  
Claudia Schulz  
Doniyor Ulmasov  
Silvia Vinyes Mora  
Jacek Zienkiewicz  

Imperial College London

ACM Student Chapter  
http://acm.doc.ic.ac.uk/
Conference Organisation

Ambassadors

Sami Alajrami  
Abdallah Arioua  
Shaswar Baban  
Gabriel Barata  
Evgenij Belikov  
Tarek Besold  
Guido Boella  
Benoit Desouter  
Emmanuelle Dietz  
Stefan Ellmauthaler  
Jorge Fandiño  
Manoel Franca  
Virginia Grande  
Carlos A.S.J. Gulo  
Evgenios Hadjisoteriou  
Haruna Isah  
Mathilde Janier  
Amin Mobasheri  
Tiago Oliveira  
Sandro Pinto  
Thomas Schön  
Zohreh Shams  
Christof Spanring  
Bas van Gijzel  
Agnieszka Zbrzezny

Newcastle University  
University of Montpellier  
Kings College London  
University of Lisbon  
Heriot-Watt University  
University of Osnabrück  
University of Turin  
Ghent University  
Dresden University of Technology  
Leipzig University  
University of A Coruña  
City University London  
Uppsala University  
University of the State of Mato Grosso  
University of Cyprus  
University of Bradford  
University of Dundee  
Heidelberg University  
University of Minho  
University of Minho  
Uppsala University  
University of Bath  
University of Liverpool & Vienna University of Technology  
University of Nottingham  
Częstochowa University of Technology
External Reviewers

Evgenij Belikov  Heriot-Watt University
Álvaro Câmar  University of Porto
Khaled El-Abbasy  University of Westminster
Jorge Fandiño  University of A Coruña
Virginia Grande  Uppsala University
Evgenios Hadjisoteriou  University of Cyprus
Haruna Isah  University of Bradford
Carlos A.S.J. Gulo  University of the State of Mato Grosso
Olfat Mirza  University of Warwick
Tiago Oliveira  University of Minho
Hasmik Osipyan  National Polytechnic University of Armenia
Simone Prado  São Paulo State University
Thiago Rúbio  Federal Center for Technological Education of Minas Gerais
F. Sharmila Satthar  University of Brighton
Julius Schöning  University of Osnabrück
António Silva  University of Minho
Maciej Skorski  University of Warsaw
Christof Spanring  University of Liverpool
Shazia Tabassum  University of Porto
Agnieszka Zbrzezny  Częstochowa University of Technology
Jian Zhang  University of Dundee
Supporters and Sponsors

Supporting Scientific Institutions

Imperial College London
http://www.imperial.ac.uk/

Platinum Sponsors

Google Inc.
http://www.google.com/

Bronze Sponsors

ARM Holdings, plc.
http://www.arm.com/