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(Editors)

Inconsistency Tolerance

Dagstuhl Seminar 03241 – June 09 to June 13, 2003
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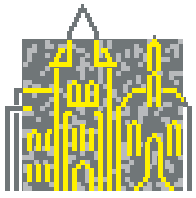

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Das Internationale Begegnungs- und Forschungszentrum für Informatik (IBFI) Schloss Dagstuhl ist eine gemeinnützige GmbH. Sie veranstaltet regelmäßig wissenschaftliche Seminare, welche nach Antrag der Tagungsleiter und Begutachtung durch das wissenschaftliche Direktorium mit persönlich eingeladenen Gästen durchgeführt werden.

Gesellschafter:

- Gesellschaft für Informatik e.V. – Bonn
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Introduction

Database, Knowledgebase and Software systems, or their logical specifications, may become inconsistent in the sense of containing contradictory pieces of information. Since these types of technology are at some level based on classical logic, there is the major problem that in classical logic, any formula is implied by a contradiction. This therefore raises the need to circumvent this fundamental property of classical logic whilst supporting as much as possible of classical logic for these technologies. To address this, several new logics, with new formalisms, semantics and/or deductive systems, that can accommodate classical inconsistencies without becoming trivial, have been proposed. These logics are starting to be used in databases, knowledgebases and software specifications.

In addition, we need strategies for analysing inconsistent information. This need has in part driven the approach of argumentation systems which compare pros and cons for potential conclusions from conflicting information. Also important are strategies for isolating inconsistency and for taking appropriate actions, including resolution actions. This calls for uncertainty reasoning and meta-level reasoning. Furthermore, the cognitive activities involved in reasoning with inconsistent information need to be directly related to the kind of inconsistency. So, in general, we see the need for inconsistency tolerance giving rise to a range of technologies for inconsistency management. We are now at an exciting stage in this direction. Rich foundations are being established, and a number of interesting and complementary application areas are being explored in decision-support, multi-agent systems, database systems, and software engineering.

The seminar brought together specialists from the communities of knowledge representation, databases, software specification, and mathematical logic, with the aim of exchanging research results, ideas and experiences around logic based approaches to inconsistency tolerance in computational systems.

The Seminar and its Projection

The seminar concentrated on inconsistency handling in basically five areas: non-classical logic, knowledge representation and non-monotonic reasoning, logic programming, databases, and software specification.

Whenever some sort of formal logic is used to specify a system, to write down a theory, to represent data or knowledge, etc., inconsistencies may naturally arise. The problem consists then in finding the way of reasoning in the presence of such inconsistencies without trivializing the whole process; or in being able to solve the inconsistencies, e.g. passing to a new, unifying theory, representation or specification; or in being able to isolate the inconsistencies, possibly detecting and using the consistent part of the database, theory, specification, etc.

Problems around inconsistency handling, their conceptualization, solutions, techniques were presented and discussed from different perspectives. Most important in this direction was the heterogeneity of the audience and presenters, who benefited from the different kind of expertise and points of view of other participants. Illuminating discussion were

carried out, and research interaction naturally started.

The area of inconsistency handling has received considerable interest from the logical and computer science communities in the last, say three years. This seminar appeared in the right moment. It attracted many participants (and was difficult to accommodate all those who wanted to present), and there was clear interest among them in organizing a second version of it in the near future.

The organizers have already contacted Springer Verlag to publish a book as a natural follow-up of the seminar. The publishing house accepted this proposal and several of the participants (and a few other experts on the field) have already been invited to contribute with a chapter that should both survey his/her area of expertise in inconsistency handling and present some state of the art research. Around sixteen chapters are planned, several of them will be written by more than one author, since the editors have tried to encourage synergy and collaboration in this community. The invitation has been positively received by all the potential authors. The chapters have to be submitted in December 2003. After that they will go through an anonymous review process, that will determine which of them will be accepted, possibly subject to changes. The editors will be L. Bertossi, A. Hunter, and T. Schaub.

Presenters (with schedule)

Tuesday 10

- 9:00-10:30
  - Arnon Avron (`/03241/Proceedings/#Avron, Arnon`)(Tel Aviv University). Combining Classical Logic, Paraconsistent Logic and Relevance Logic.
  - Jerome Lang (`/03241/Proceedings/#Lang, Jerome`), (IRIT-Toulouse). Inconsistency Resoluting by Variable Forgetting.
  - Steve Easterbrook (`/03241/Proceedings/#Easterbrook, Steve`)(University of Toronto). A Category-Theoretic Approach to Composing Inconsistent Views.
- 11:00-12:00
  - Heinrich Herre (`/03241/Proceedings/#Herre, Heinrich`)(Universitaet Leipzig). A Paraconsistent Semantics for Logic Programs.
  - Leo Bertossi (`/03241/Proceedings/#Bertossi, Leo`)(Carleton University, Ottawa). Consistent Answers from Inconsistent Databases.
- 14:00-15:30
  - Loreto Bravo (`/03241/Proceedings/#Bravo, Loreto`)(Universidad Catolica de Chile). Consistent Answers from Integrated Data Sources.
  - Thomas Eiter (`/03241/Proceedings/#Eiter, Thomas`)(TU Wien). Optimizing Consistent Query Answering from Data Integration Systems.

  - Shekhar Pradhan (/03241/Proceedings/#Pradhan, Shekhar)(Central Missouri State University-Warrensburg). Connecting Databases, Conflicts in Information, and Argumentation.

- 16:00-17:00
  - Stefan Woltran (/03241/Proceedings/#Woltran, Stefan)(TU Wien). Paraconsistent Reasoning via Quantified Boolean Formulas I
  - Torsten Schaub (/03241/Proceedings/#Schaub, Torsten)(Universitaet Potsdam). Paraconsistent Reasoning via Quantified Boolean Formulas II

Wednesday 11

- 9:00 – 10:30
  - Anthony Hunter (/03241/Proceedings/#Hunter, Anthony)(University College London). Measuring the Degree and Significance of Inconsistencies.
  - Sebastien Konieczny (/03241/Proceedings/#Konieczny, Sebastien)(IRIT-Toulouse). When Inconsistencies are from Several Sources: Belief Merging as a Game on Beliefs.
  - Marsha Chechik (/03241/Proceedings/#Chechik, Marsha)(University of Toronto). Reasoning about Inconsistent Systems: A Model-Checking Approach.

- 11:00 – 12:00
  - Jan Chomicki (/03241/Proceedings/#Chomicki, Jan)(SUNY at Buffalo). Consistent Answers to Quantifier-Free Queries.
  - Ariel Fuxman (/03241/Proceedings/#Fuxman, Ariel)(University of Toronto). Tractability and Expressibility in Consistent Query Answering.

- 14:00 – 15:00
  - Ofer Arieli (/03241/Proceedings/#Arieli, Ofer)(Academic College of Tel Aviv). Database Integration: Preferential Semantics and Abductive Reasoning.
  - Stuart C. Shapiro (/03241/Proceedings/#Shapiro, Stuart C.)(SUNY at Buffalo). Inconsistency Tolerance in SnePS.

- 16:00 – 17:00
  - Joao Marcos (/03241/Proceedings/#Marcos, Joao)(State University of Campinas). Mechanizing Deduction for Tarskian Logics (even when contradictions draw near).
  - Randy Goebel (/03241/Proceedings/#Goebel, Randy)(University of Alberta). Compact Representation of Potentially Inconsistent Beliefs.

Thursday 12

- 9:00 – 10:30
  - Pierre Marquis (/03241/Proceedings/#Marquis, Pierre)(Universite d'Artois-Lens). Complexity Results for Paraconsistent Inference Relations.
  - Laurence Cholvy (/03241/Proceedings/#Cholvy, Laurence)(ONERA – Toulouse). Reasoning with Merged Contradictory Information.
  - Jef Wijsen (/03241/Proceedings/#Wijsen, Jef)(Universite de Mons). Condensed Representation of Database Repairs for Consistent Query Answering.
- 11:00 – 12:00
  - Dietmar Seipel (/03241/Proceedings/#Seipel, Dietmar)(Universitaet Wuerzburg). State–Based Semantics for Disjunctive Logic Programming.
  - François Bry (/03241/Proceedings/#Bry, FranÃğois)(Universiaet Muenchen). Logics for Inconsistency Tolerant Reasoning.
- 14:00 – 15:00
  - Claudio Gutierrez (/03241/Proceedings/#Gutierrez, Claudio)(Universidad de Chile). RDF and Inconsistency.
  - Can Türker (/03241/Proceedings/#TÃijrker, Can)(ETH Zuerich). Inconsistency Tolerance in Hyper-Databases.

Friday 13

- 9:00-10:00
  - Gerhard Brewka (/03241/Proceedings/#Brewka, Gerhard)(Universitaet Leipzig). Using Preferences for Handling Inconsistency.
  - Hendrik Decker (/03241/Proceedings/#Decker, Hendrik)(Instituto Tecnologico de Informatica, Valencia). Trading Off Consistency and Availability.
- 10:15-11:15
  - Maurice Pagnucco (/03241/Proceedings/#Pagnucco, Maurice)(University Sydney). Belief Revision via Prime Implicates.
  - John Slaney (/03241/Proceedings/#Slaney, John)(Australian National University-Canberra). Remarks of Paraconsistent Logics.

Participants

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