

Inconsistency Tolerance in Database, Knowledgebase and Software Systems

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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.

This seminar will bring 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. Among the specific topics to be discussed we find:

- Theoretical foundations of applications of non classical logics, e.g. paraconsistent logic, multivalued logic, annotated logic, deontic logic, etc., to specification of computational systems.

- Inconsistency handling in software engineering, database and knowledgebase systems:
 - detection and resolution of inconsistencies,
 - supporting non-trivial automated reasoning and retrieval of meaningful information in the presence of logical inconsistencies,
 - analysis, classification and modeling of inconsistencies,
 - consistent integration of logical specifications.
 - consistent integration of heterogeneous knowledgebase and database systems.

- Theoretical foundations of argumentation systems and related technologies for analysis, checking, detection, resolution and isolation of inconsistency in information