3.7 Database Repairs

Jef Wijsen (University of Mons, BE)

Research in database repairing and consistent query answering started with the seminal paper [Arenas, Bertossi, and Chomicki, PODS 1999]. In this talk, we survey twenty years of research in this field, with a particular focus on the following topics:

- database dependencies that have appeared in logics for dependence and independence;
- a generic definition of the notion of database repair;
- the computational complexity of the problem known as symmetric-difference repair checking, for different classes of database dependencies;
- the computational complexity of symmetric-difference consistent query answering with respect to conjunctive queries and different classes of database dependencies;
- a fine-grained complexity classification for consistent query answering to self-join-free conjunctive queries with respect to key dependencies.

3.8 Complexity Classifications of Functional Dependencies in Database Repairing

Benny Kimelfeld (Technion – Haifa, IL)

The talk describes our research on the computational complexity of problems that arise in reasoning about the inconsistency of databases. To that extent, an inconsistent database is a database that violates a set of integrity constraints, and a repair is a consistent database that is obtained from the inconsistent one via a legitimate sequence of repairing operations. Focusing on functional dependencies as constraints and tuple deletions as repairing operations, I discuss several related computational problems. One problem is that of repairing through a minimal number of deletions. Another problem is that of finding a most probable repair when tuples are associated with probabilities. Other problems involve counting and enumerating set-minimal repairs, possibly in the presence of preferences among tuples. In each problem, the talk focuses on the classification of the constraint sets into ones that admit a tractable solution, and ones that are provably hard.

3.9 Semiring Provenance for Logics with Team Semantics

Erich Grädel (RWTH Aachen, DE)

Joint work of Erich Grädel, Lukas Huwald

We extend the approach of provenance analysis by interpretations in commutative semirings to logics of dependence and independence. We investigate issues such as locality, closure properties, game based analysis, and expressive power in this wider context. It turns out that for a smooth theory the cases of idempotent or absorptive semirings seem particularly adequate.