Towards Practical Computation of Consistent Query Answers

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In their PODS'99 paper, Arenas, Bertossi and Chomicki proposed a semantic model for querying inconsistent databases. They defined consistent query answers to be the answers that are true regardless of how the database is repaired to remove integrity violations. They also proposed a mechanism to obtain such answers through the evaluation of a transformed version of the original query.

Here, we describe a new approach to the problem of computing consistent query answers. The approach is based on conflict hypergraphs – compact representations of the set of all repairs of the database. It is applicable to quantifier-free queries and denial constraints. It has been implemented in a middleware system called HIPPO that serves as a front-end to Postgres.

We compare our approach to other proposed approaches to the computation of consistent query answers, in particular query transformation and logic-program-based methods. We discuss further possible refinements and extensions of our approach. We also address the inherent limitations imposed by the computational complexity of the problem of computing consistent query answers.

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