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Title: « TUPLE INCONSISTENCY MEASURES / TOWARDS EXPLAINING QUERY ANSWERS»

Short Abstract:

We introduce novel tuple inconsistency measures that quantify the extent to which individual tuples contribute to violations of denial constraints in inconsistent databases. Then, we formally show that one of the proposed measures fully satisfies a set of well-motivated axiomatic properties.

As an application, we lift tuple inconsistency to the level of query answers, obtaining a principled framework for measuring and explaining the inconsistency inherent in query results. We further investigate the computational complexity of tuple and answer inconsistency measures under denial constraints, identifying tractable cases that make their application to real-world data feasible.

Finally, our experimental study on varying dataset- and inconsistency-settings demonstrates that, in comparison to existing methods, the proposed measures yield more fine-grained and informative assessments of inconsistency in databases.