

Title : the equational theory of relational lattices

The natural join and the inner union operations combine relations of a database. Tropashko and Spight realized that these two operations are the meet and join operations in a class of lattices, known by now as the relational lattices. They proposed then lattice theory as an algebraic approach to the theory of databases, alternative to the relational algebra. Previous works proved that the quasiequational theory of these lattices—that is, the set of definite Horn sentences valid in all the relational lattices—is undecidable, even when the signature is restricted to the pure lattice signature.

In this talk I'll overview on a recent result of us, proving that the equational theory of relational lattices is decidable. We achieve this result by showing that if an inclusion $t \leq s$ fails in any of these lattices, then it fails in a relational lattice whose size is bound by a triple exponential function of the sizes of t and s . This construction relies on many ingredients and ideas that we shall expose: a duality theory for lattices, generalized ultrametric spaces, injectivity, functoriality.

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