Transitivity and Equivalence in Decidable Fragments of First-Order Logic

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Abstract

Of all the properties of binary relations encountered in logic, those of transitivity and equivalence are perhaps the most salient. On the other hand, it is well-known that these properties are typically not expressible in fragments of first-order logic for which the satisfiability problem is known to be decidable - most notably, the two-variable fragment and the guarded fragment. The question therefore arises as to what happens to familiar, decidable fragments of first-order logic under the assumption that a specified collection of binary predicates be interpreted as transitive relations or as equivalences. This question has been the subject of intensive study in the past few years, and my talk summarizes the current state of play in this area.

Short CV. Ian Pratt-Hartmann studied Mathematics and Philosophy at Brasenose College, Oxford, and Philosophy at Princeton and Stanford Universities, gaining his PhD. from Princeton in 1987. He is currently Senior Lecturer in the Department of Computer Science at the University of Manchester. Dr. Pratt-Hartmann's research interests range widely over the fields of computational logic, spatial logic and natural language semantics.