Non-Axiomatizability of the Equational Theories of Positive Relation Algebras

Amina Doumane ✉
CNRS, ENS Lyon, France

Abstract

In the literature, there are two ways to show that the equational theory of relations over a given signature is not finitely axiomatizable. The first-one is based on games and a construction called Rainbow construction. This method is very technical but it shows a strong result: the equational theory cannot be axiomatized by any finite set of *first-order formulas*. There is another method, based on a graph characterization of the equational theory of relations, which is easier to get and to understand, but proves a weaker result: the equational theory cannot be axiomatized by any finite set of *equations*.

In this presentation, I will show how to complete the second technique to get the stronger result of non-axiomatizability by first-order formulas.

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