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Counterexample to Conjectures of Bonato-Tardif, Thomassé and Tyomkyn, Future Directions

Two structures R and S are called *equimorphic* when each embeds in the other; we may also say that one is a *sibling* of the other. Equimorphic finite structures are necessarily isomorphic, but this is no longer the case for infinite structures. For instance, the rational numbers, considered as a linear order, has continuum many siblings, up to isomorphism. Thomassé (2000) conjectured that a countable relation has either one, countably or continuum many siblings, up to isomorphism. There is a special case of interest stating that a relational structure of any cardinality has one or infinitely many siblings. This is connected to a conjecture of Bonato-Tardif stating that a tree has one or infinitely many siblings.

In this talk we introduce the conjectures mentioned and those structures for which the conjectures have been verified by giving historical progress. Then, we introduce a counterexample to the conjectures and state open problems in the sibling program.