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Title: Homomorphism Testing Strategies For Oriented Trees

Abstract: Given a finite digraph G, the problem HOM(G) which decides whether, given some finite digraph H, H admits a homomorphism to G, is a problem conjectured to split the class of all finite digraphs into two subclasses: those G for which the problem is tractable (i.e. in P) and those for which it is NP-hard. In order to prove that HOM(G) is tractable for some fixed G, one needs to exhibit a polynomial algorithm which will terminate successfully for every digraph H for which such a homomorphism exists. All known examples of oriented trees for which the problem is provably tractable are such that a particular class of algorithms, the so-called consistency checks, demonstrate its membership in the class P. In this talk, we will show that all finite oriented trees for which the problem is tractable are of bounded width, i.e. the consistency checks are the adequate class of algorithms proving the tractability of HOM(T), where T is a finite oriented tree.