

# Tree unfoldings and their finite counterparts

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Tree unfoldings of transition systems or more generally of relational structures are typically infinite and therefore not directly available for arguments in finite model theory. Substitutes for the full acyclicity of tree-like structures and for saturation properties over these can sometimes be obtained through finite cover constructions. For instance, a re-investigation of some recent results shows that every finite relational structure possesses, for every  $n$ , (a) an infinite omega-tree unfolding and (b) a finite guarded bisimilar cover that are FO-equivalent up to quantifier rank  $n$ . One new application yields an expressive completeness proof for the guarded negation fragment of Barany, ten Cate and Segoufin also in the sense of finite model theory.