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Finite big Ramsey degrees in countable universal structures

Let F be a countable ultrahomogeneous relational structure, and let $\mathrm{Age}(F)$ denote the class of all the finite structures that F embeds. A positive integer n is a *big Ramsey degree* of a finite structure $A \in \mathrm{Age}(F)$ in F if for every $k \geq 2$ and every coloring of copies of A in F with k colors, there is a copy F' of F inside F such that the copies of A that sit inside F' attain at most n colors in this coloring. In this case we say that A has *finite big Ramsey degree in* F. For example, Glavin proved in 1968/9 that finite chains have finite big Ramsey degrees in $\mathbb{Q}$, Sauer proved in 2006 that finite graphs have finite big Ramsey degrees in the Rado graph, and Dobrinen has just recently proved that finite triangle-free graphs have finite big Ramsey degrees in the Henson graph H_3.

In this talk we consider the context where F is a countable structure universal for a class of finite structures, but not necessarily an ultrahomogeneous one. For each of the following classes of structures:

- acyclic digraphs,
- finite permutations,
- a special class of finite posets with a linear order extending the poset relation, and
- a special class of metric spaces

we show that there exists a countably infinite universal structure S such that every finite structure from the class has finite big Ramsey degree in S. Although not apparent from the formulation of the results, the techniques we use heavily rely on the reinterpretation of Ramsey theoretic notions in terms of category theory.