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Non-Trivial Decidable Nested Recurrence Relations

The question of decidability of nested recurrence relations has been studied by Celaya and Ruskey in their 2012 paper, where an example of an undecidable nested recurrence relation is given. In this talk we discuss a general result about decidable nested recurrence relations satisfying two boundedness conditions, and use it to prove the decidability of a class of non-trivial nested recurrence relations over integers of the form $G(n) = G(n - \sum_{i=1}^K \alpha_i G(n - i))$. We also discuss the decidability of certain unbounded nested recurrence relations.

(Joint research with Frank Ruskey.)