

Logic Seminar

Expansions by k -regular sets of reals: toward a characterization of V_k definability

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Abstract: Büchi automata are the natural extension of finite automata to a model of computation that accepts infinite-length inputs. We say a subset X of the reals is k -regular if there is a Büchi automaton that accepts (one of) the base- k representations of every element of X , and rejects the base- k representations of each element in its complement. These sets often exhibit fractal-like behavior—e.g., the Cantor set is 3-regular. Let V_k be a ternary predicate such that $V_k(x,u,d)$ holds if and only if u is an integer power of k and d is the coefficient of the term u in some base- k expansion of x . For a fixed k and for each natural number n , all of the k -regular subsets of Euclidean space definable in the expansion of the ordered additive group of reals by the predicate V_k . In this talk, we will discuss the significance of the ordered additive group of reals by V_k (and its reducts) from the perspectives of tame geometry and neostability. We will also discuss current and ongoing progress toward a characterization of the reducts of this structure in terms of definability, neostability, and fractal dimensions.

Tuesday, April 25 at 4:00 PM in 636 SEO