Abstract

The generation problem for a finitely generated group G asks whether there exists an algorithm that decides, given a finite subset $X \subseteq G$, whether X generates G. While this problem is undecidable in general, it is decidable for some specific groups.

For each natural $n \geq 2$, Thompson's group F_n consists of all piecewise-linear homeomorphisms of the unit interval with finitely many breakpoints in $\mathbb{Z}\left[\frac{1}{n}\right] \cap (0,1)$ and slopes that are powers of n. It also has a combinatorial description via n-ary trees. F_n is finitely presented, and its abelianization is $\mathbb{Z}^n$. Golan found an algorithm that solves the generation problem in F_2. This talk is based on my thesis under the supervision of Gili Golan. I will describe sufficient conditions for a finite set to generate F_n, for general $n \geq 2$. As an application, we construct maximal subgroups of F_n that do not fix any point in the open unit interval, answering a question originally posed by Savchuk and generalized by Aiello and Nagnibeda. In particular, for every $n \geq 2$, the group F_n contains a maximal subgroup isomorphic to F_{2n-1}.