

A short proof of the existence of strongly aperiodic subshifts over $\{0, 1\}$ in countable groups

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A Theorem of Gao, Jackson and Seward, originally conjectured to be false by Glasner and Uspenskij, asserts that every countable group admits a strongly aperiodic subshift over a 2-symbol alphabet. Their proof consists of a quite technical construction. We give a shorter proof of their result by using the asymmetrical version of Lovasz Local Lemma which allows us also to prove that this subshift is effectively closed (with an oracle to the word problem of the group) in the case of a finitely generated group. We also study the problem of constructing subshifts which generalize a property of Sturmian sequences to finitely generated groups. More precisely, a subshift over the alphabet $\{0, 1\}$ has uniform density $\alpha \in [0, 1]$ if for every configuration the density of 1's in any increasing sequence of balls converges to α . We show a slightly more general result which implies that these subshifts always exist in the case of groups of subexponential growth.

This is about joint work with Nathalie Aubrun and Stéphane Thomassé.