Groups that are locally determined by inverse semigroups

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Abstract

Given a space X and a collection C of invertible transformations $t : A \to B$ between subsets of X, we say that a bijection $f : X \to X$ is locally determined by C if X can be partitioned into finitely many sets $A_1, A_2, ..., A_n$ such that the restriction of f to A_i is in C, for all i.

Under suitable (mostly obvious) assumptions about the collection C, the set of all such bijections will be a group. We call it the group that is locally determined by C. The required assumptions can easily be met by assuming that C forms an inverse semigroup. We thus arrive at the class of groups indicated in the title.

Many well-known groups fit into the above setting, including Thompson's groups F, T, and V, the Brin-Thompson groups nV, groups of quasiautomorphisms of the binary tree, various examples that were studied by Nekrashevych and Roever, Monod's group of piecewise projective homeomorphisms of the circle, and others.

The goal of this talk (or series of talks) will be to build classifying spaces for the given class of groups and to prove finiteness properties. [For the uninitiated, by a classifying space for G I mean a contractible complex on which the group acts, usually freely or with finite stabilizers. The finiteness properties in question are the F_n properties, where a group is F_1 if it is finitely generated, and F_2, if it is finitely presented. The properties F_n (for n bigger than 2) are generalizations of these with topological definitions.] The ultimate goal of the larger project is to build useful classifying spaces for a (potentially) vast number of groups within a common framework.

This is joint work in progress with Bruce Hughes. I will try to start from "zero"; the first talk will include lots of examples.