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R I Grigorchuk and **Z Sunik***, sunik@math.tamu.edu. *Hanoi towers, automaton groups and branch groups*. Preliminary report.

We model several versions of the well known Hanoi towers problem (for any number of pegs and with various restrictions on possible moves) by using automaton groups. The recursive nature of the problems is reflected in the self-similarity of the automaton groups that model them. The configuration space for n disks corresponds to the action of the automaton group on level n of a rooted p -regular tree, where p is the number of pegs. We show that some of the obtained automaton groups have branching structure. (Received August 16, 2005)