Automata groups

Andrzej Zuk

Paris 7

The class of automata groups contains several remarkable countable groups. Their study has led to the solution of a number of important problems in group theory. Its recent applications have extended to the fields of algebra, geometry, analysis and probability.

Together with arithmetic and hyperbolic groups, automata groups dominate the modern landscape of theory of infinite groups.

As examples of this construction we have chosen the following problems:

- Burnside problem. Infinite finitely generated torsion groups.
- Milnor problem. Constructions of groups of intermediate growth.
- Atiyah problem. Computation of L^2 Betti numbers.
- Day problem. New examples of amenable groups.
- Gromov problem. Groups without uniform exponential growth.