

Automata generating free products of groups of order 2

Marcelo Miranda¹, ¹Departamento de Matemática, University of Campinas, Campinas, Brazil

Abstract

An *automaton* (or a *Mealy automaton*) \mathcal{A} consists of a tuple (Q, X, π, λ) , in which Q is a set of states, X is a finite alphabet, $\pi : Q \times X \rightarrow Q$ is a transition function and $\lambda : Q \times X \rightarrow X$ is an output function. Among all the types of automata, we highlight finite invertible automaton in order to define an automata group.

A special family of automata which has fundamental importance to our work is the Bellaterra automata family, first studied during the summer school in automata groups at the University of Barcelona in Bellaterra, in 2004 (this is why these automata receive this name); such automata are defined by wreath recursion.

On this presentation, we construct a family of automata (the Bellaterra automata) with $n \geq 4$ states acting on a rooted binary tree generating free products of cyclic groups of order 2 by going through the concept of automata group. This study is based on the article [3].

References

- [1] Meier, J., Groups, Graphs and Trees - An Introduction to the Geometry of Infinite Groups. *London Mathematical Society Student Texts*, Cambridge University Press, 2008.
- [2] Nekrashevych, V., Self-similar groups and their geometry, *São Paulo Journal of Mathematical Sciences*, volume 1, 2007.
- [3] Savchuk, D. and Vorobets, Y. Automata generating free products of groups of order 2, *Journal of Algebra*, volume 336, 2011.

¹marcelomiranda_01@hotmail.com