

Finite automata : enumeration and analysis of algorithm.

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JM2014 – September 2014

Abstract

In this talk we present results about enumeration of deterministic and accessible (ie, each state can be reached from the initial state) automata. We precisely estimate the asymptotic proportion of minimal automata amongst complete deterministic and accessible ones.

All these estimations are obtained through combinatorial interpretations of structural properties of automata and making use of bijections that allow to reduce the combinatorial study to special tableaux.

These results have important consequences in term of average-case complexity of algorithms handling automata (like Moore's state minimization algorithm, Hopcroft's state minimization algorithm or random generation of automata). We conclude with the presentation of open problems.

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