Michael A. Arbib

THEORIES OF ABSTRACT AUTOMATA

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An elaborate study of automata cannot begin, if deprived of a comprehensive view of the theory of automata, and without a succinct presentation of the theory of groups and semi-groups. Starting from this need, the author approaches the study of finite automata, of Turing machines and of Post's system, making the connection with the languages accepted by these automata, i.e.: languages with a finite number of states, context-dependent and independent languages.

While considering automata as particular systems, deterministic or non-deterministic, the author felt that it is necessary to present also notions connected with the theory of algorithms (recursive functions and their equivalency with calculable Turing functions). Concepts on stochastic automata, Korhn and Rodhes theory, algebraic decompositions of the automaton states set, a.s.o., are presented at length, for a better understanding of data on machines which compute and build themselves.

The whole work is strewn with exercises, proposed to be solved, with a view to making a more thorough study of the presented theoretical problems, while the demonstration of some propositions and theorems is let in the reader's charge.

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