

Tree Automata and Essential Input Variables

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Abstract

The consideration that finite automata may be viewed as unary algebras is attributed to J.Thatcher and J.Wright (1965). In the many of the papers trees were defined as terms. Investigations on regular and context-free tree grammars are dated in the late 60-th. The algebraic theory of terms was created and developed to equational theory in the works of A.Malc'ev, G.Grätzer etc. approximately in the same time. Later it is developed by many authors - J.Rosenberg, K.Denecke, D.Lau, R.Pöshel etc. In the papers of S.Jablonsky, A.Salomaa, K.Chimev etc. the theory of essential variables was developed.

The present paper is an attempt to connect these three fields of theoretical computer science. We introduce the essential inputs (variables) for terms (trees) and tree automata . There are investigations which treat some rules for removing and adding fictive (non-essential) inputs to a term. We consider a new point of view on the minimization of tree-automata and tree-languages. Such minimization is realized by a procedure (algorithm).

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