Extremal minimality conditions on automata. (English summary)


Minimality of a deterministic finite automata (DFA) concerns the cardinality of its set of states $Q$. The choice of a set $F$ of final states defines a coloring of the closed components in the state-pair graph of the DFA, whereas minimality corresponds to a certain property of these colored components. For strongly connected and complete DFAs the authors study the notions of “uniform minimality” (minimal for any set $F$; $F \subseteq Q$), “almost uniform minimality” (minimal for any $F$ with $F \subset Q$) and “never-minimality” (not minimal for any choice of $F$).

The main results include existence theorems as well as characterizations of these families of DFAs (e.g., in terms of multi-entry automata, syntactic monoids, or Fischer covers of irreducible sofic shifts in symbolic dynamics). As a consequence, a polynomial-time algorithm is obtained for testing the almost minimality of a DFA.

Reviewed by Peter R. J. Asveld

References


Note: This list reflects references listed in the original paper as accurately as possible with no attempt to correct errors.

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