Theory of Automata Assignment 2

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PROBABILISTIC KLEENE THEOREM

The Paper discusses a Probabilistic counterpart of Kleene's theorem, which relates to the equivalence of rational and recognizable Languages in the free monoids. The author aims to represent quantitative Properties of words using expressions and automata and further proves that expressions can capture two Probabilistic automata, and automata with Pebbles which can be considered as a Probabilistic generalization of xpath. In this paper, we introduced a probabilistic Kleene theorem for both classical and extended probabilistic automata, which include two-way navigation and pebbles. Our work serves as a starting point for developing a Probabilistic version of xpath and extending our result to Probabilistic tree automata. We also pose the Question of whether our technique can be applied to obtain w-expressions for probabilistic Buche automata, which have received significant attention. In addition, there have been recent efforts to characterize probabilistic automata using monadic Second-order Logic, and exploring alternative characterizations that utilize a transitive-closure operator could be a fruitful avenue for future research.

KLEENE THEOREM FOR AUTOMATA

The paper introduces timed regular expressions which are a more advanced form of a regular expressions that can be used to describe the sets of dens-time, discrete- value signals. The authors demonstrate that this formalism is as expressive as Alux and Dill's timed automata, and. they do so by Outlining a process for translating their expression into automates and vice versa. Additionally, the authors expand finding to include regular expressions, on Buchi's theorem.