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Constructing Fuzzy Tree Automata by Property Diagram

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Abstract

Fuzzy tree automata (FTA) are mathematical devices for modeling and processing vaguely defined trees. The behavior of an FTA is a mapping from a set of regular trees on ranked alphabets to fuzzy membership grades. In other words, FTA act as nonlinear fuzzy membership functions that assign membership grade to each tree based on its structural properties. On the other hand, if some structural properties define a set of regular trees, it may be possible to define its corresponding FTA. This paper introduces the notion of fuzzy property diagram to organize complex properties in a graph structure to employ it in construction of FTA. As well, we present some algorithms and methods for constructing a property diagram from a set of properties and defining the corresponding FTA.

Keywords: Fuzzy Tree Automata, Fuzzy Tree Language, Structural Tree Property, Property Diagram