

# Tree Automata and Essential Subtrees

Sl. Shtrakov

## **Abstract**

Terms considered as trees are very useful tools for presentation and manipulation of different data structures in Computer Science and Information Technology. Any work of the computer over the trees, for instance as graphical user interface (menus of the different windows), XML - documents, definitions and description of hierarchial objects in C++ or Java programming etc. can be considered as runs of an automaton (the given computer) over these trees. Often the automaton loses much time to work over a tree spending it in some useless checking of nonessential information. Usually it means that some inputs or some subtrees of the given tree are fictive for this automaton. The studying of fictive and essential subtrees of a tree with respect to an automaton is main aim of the article. We introduce essential subtrees for terms (trees) and tree automata . There are some results concerning independent sets of subtrees and separable sets for a tree and an automaton.

AMS classification 03D05, 68Q70, 03D15, 06B25

Key words: Tree, Tree Automata, Essential Input, Essential Subtree