VYPa: Visibly Pushdown Transducers

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Abstract

Visibly Pushdown Transducers (VPT) are basically *visibly pushdown automata* (VPA) with the ability to generate output. First of all we will focus on VPAs where we will show differences between VPAs and common *pushdown automata* (PDA). VPAs are automata model accepting nested words. Nested words over an alphabet Σ are pairs where the first element is a string and the second element is a matching relation (defines a call, return and pending position). The difference between VPAs and PDAs is that the VPAs input alphabet is divided into three sets: call symbols, return symbols and internal symbols. Thus the transition function is also partitioned into three parts: call transitions, return transitions and internal transitions. When the VPA use the call transitions, they read the call symbol and add symbol from stack alphabet to the top of the stack. In case of return transitions, they read the return symbol and pop the top symbol from the stack. VPA by using internal transitions only read the internal symbol and the stack is not manipulated. After this introduction to VPAs we will introduce VPTs as VPAs with the ability to generate words onto output tape. We will also mention closure properties of VPTs and their usage.