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REGULATED INSERTION-DELETION SYSTEMS

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ABSTRACT

Insertion and deletion operations appear in several areas of theoretical computer science, as well as in linguistics and DNA computing. In this paper, we investigate insertion and deletion within the regulated rewriting framework, i. e., the rule application is subject to additional constraints. We consider various regulation mechanisms already considered or not in the area of insertion-deletion systems. Beside recalling existing results, we present a series of new results related to the use of prescribed sequences, time-varying and cooperating distributed (CD) controls.

Keywords: insertion-deletion, regulated rewriting, time-varying grammar, matrix grammar, graph-controlled grammar, cooperating distributed grammar system

1. Introduction

Regulated rewriting is a general term for the framework where the derivations in (mostly context-free) grammars are restricted by control mechanisms that allow for increasing the computational power of the underlying grammars, thus usually permitting to go beyond the original language family (for example, getting the family of recursively enumerable languages instead of only the family of context-free languages). The best-known variants of such control mechanisms are matrix, graph-controlled,

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