Compositional Properties of Watson-Crick Context-Free Grammars

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Abstract

Described as a molecule, or simply known as DNA, contains the instructions for many theoretical computing models, such as sticker systems and Watson-Crick grammars. Sticker systems are the abstraction of ligation processes performed on DNA, while Watson-Crick grammars are those motivated by Watson-Crick finite automata and Chomsky grammars. Both of these theoretical models benefit from the Watson-Crick complementarily rule. In this paper, we establish the results on the relationship between Watson-Crick linear grammars, which is included in Watson-Crick context-free grammars, and sticker systems. We show that the family of arbitrary sticker languages, generated from arbitrary sticker systems, is included in the family of Watson-Crick linear languages, generated from Watson-Crick linear grammars, in 2015 IEEE.

Keywords

formal grammars, formal languages, sticker systems, Watson-Crick automata, Watson-Crick grammars

Indexed keywords

Engineering controlled terms: Computational grammars, Formal languages, Nucleic acids
Chomsky grammars, Computational properties, Formal grammars, Linear language, Sticker systems, Watson-Crick automata, Watson-Crick finite automata, Watson-Crick grammars

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