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## Watson-Crick Context-Free Grammars: Grammar Simplifications and a Parsing Algorithm

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### Abstract

A Watson-Crick (WK) context-free grammar, a context-free grammar with productions whose right-hand sides contain nonterminals and double-stranded terminal strings, generates complete double-stranded strings under Watson-Crick complementarity. In this paper, we investigate the simplification processes of Watson-Crick context-free grammars, which lead to defining Chomskylike normal form for Watson-Crick context-free grammars. The main result of the paper is a modified CYK (Cocke-Younger-Kasami) algorithm for Watson-Crick context-free grammars in WK-Chomsky normal form, allowing to parse double-stranded strings in  $O(n^6)$  time.

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