Cognitive Technologies

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Parsing Beyond Context-Free Grammars

Springer

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Preface

Given that context-free grammars cannot adequately describe natural languages, grammar formalisms beyond CFG that are still computationally tractable are of central interest for computational linguists. However, despite the considerable interest in such formalisms and in their various parsing algorithms, a coherent textbook that allows access to the large body of knowledge on polynomial-time parsing beyond context-free grammars has not been available so far. Textbooks on parsing covered mainly context-free grammars while mentioning more powerful formalisms only very briefly.

This want of a detailed presentation of grammar formalisms and parsing beyond CFG is addressed with this book. The book provides an extensive overview of the formal language landscape between CFG and PTIME. It moves from Tree Adjoining Grammars to Multiple Context-Free Grammars and then to Range Concatenation Grammars while explaining available parsing techniques for these formalisms. The text is enriched with many illustrations and examples coming with the different formalisms and algorithms. This makes the book accessible to anybody familiar with basic notions of CFG parsing. It is useful both for researchers and students in computational linguistics and in formal language theory.

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Laura Kallmeyer

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First of all and most importantly, I want to thank my colleague Wolfgang Maier. We taught two courses at the University of Tübingen and one course at the European Summer School in Logic, Language and Information (ESSLLI) in 2008 in Hamburg, all of them covering the topic of parsing beyond context-free grammars. The idea to write this textbook arose out of these courses and much material from the course slides was reused when writing the book. The course preparations and the related discussions of the subject were crucial for achieving a good understanding of the topic and being able to cover it in a textbook. Also, when writing the book, I frequently discussed its content and structure with Wolfgang. Therefore one can say that without Wolfgang's help the book would not look as it does and, furthermore, it would very probably not exist at all.

The suggestion to write a textbook on parsing beyond context-free grammars came from Carl Vogel who participated in our ESSLLI course on this topic. I am grateful for this suggestion; it made me for the first time seriously consider the idea of covering the course material in a book.

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