

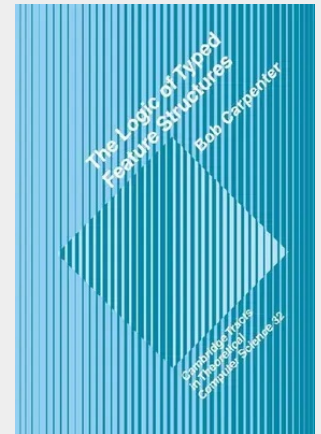
Carpenter

The Logic of Typed Feature Structures

With Applications to Unification Grammars, Logic Programs and Constraint Resolution

This book develops the theory of typed feature structures, a data structure that generalizes both first-order terms and feature structures of unification-based grammars to include inheritance, typing, inequality, cycles and intensionality. The resulting synthesis serves as a logical foundation for grammars, logic programming and constraint-based reasoning systems. A logical perspective is adopted which employs an attribute-value description language along with complete equational axiomatizations of the various systems of feature structures. At the same time, efficiency concerns are kept in mind and complexity and representability results are provided. The application of feature structures to phrase structure grammars is described and completeness results are shown for standard evaluation strategies. Definite clause logic programs are treated as a special case of phrase structure grammars. Constraint systems are introduced and an enumeration technique is developed for solving arbitrary attribute-value logic constraints. This book, with its innovative approach to data structure, will be essential reading for researchers in computational linguistics, logic programming and knowledge representation. Its self-contained presentation makes it flexible enough to serve as both a research tool and a text book.

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60,50 €

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Lieferfrist: bis zu 10 Tage

Artikelnummer: 9780521022545

Medium: Buch

ISBN: 978-0-521-02254-5

Verlag: Cambridge University Press

Erscheinungstermin: 23.09.2005

Sprache(n): Englisch

Auflage: Erscheinungsjahr 2005

Serie: Cambridge Tracts in Theoretical
Computer Science

Produktform: Kartoniert

Gewicht: 488 g

Seiten: 278

Format (B x H): 170 x 244 mm

