Constraint Satisfaction Problems: CSP Formalisms and Techniques (Iste)

By Khaled Ghedira

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A Constraint Satisfaction Problem (CSP) consists of a set of variables, a domain of values for each variable and a set of constraints. The objective is to assign a value for each variable such that all constraints are satisfied. CSPs continue to receive increased attention because of both their high complexity and their omnipresence in academic, industrial and even real-life problems. This is why they are the subject of intense research in both artificial intelligence and operations research. This book introduces the classic CSP and details several extensions/improvements of both formalisms and techniques in order to tackle a large variety of problems. Consistency, flexible, dynamic, distributed and learning aspects are discussed and illustrated using simple examples such as the n-queen problem.

Contents

1. Foundations of CSP.
2. Consistency Reinforcement Techniques.
3. CSP Solving Algorithms.
4. Search Heuristics.
5. Learning Techniques.
6. Maximal Constraint Satisfaction Problems.
7. Constraint Satisfaction and Optimization Problems.
8. Distibuted Constraint Satisfaction Problems.

About the Authors

Khaled Ghedira is the general managing director of the Tunis Science City in Tunisia, Professor at the University of Tunis, as well as the founding president of the Tunisian Association of Artificial Intelligence and the founding director of the SOIE research laboratory. His research areas include MAS, CSP, transport and production logistics, metaheuristics and security in M/E-government. He has led several national and international research projects, supervised 30 PhD theses and more than 50 Master's theses, co-authored about 300 journal, conference and book research papers, written two text books on metaheuristics and production

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