1. Record Nr. UNINA9910299253203321

Autore	Cao Longbing
Titolo	Metasynthetic Computing and Engineering of Complex Systems / / by Longbing Cao
Pubbl/distr/stampa	London : , : Springer London : , : Imprint : Springer, , 2015
ISBN	1-4471-6551-9
Edizione	[1st ed. 2015.]
Descrizione fisica	1 online resource (360 p.)
Collana	Advanced Information and Knowledge Processing, , 1610-3947
Disciplina	006.3
Soggetti	Software engineering Robotics Automation Artificial intelligence Software Engineering/Programming and Operating Systems Robotics and Automation Artificial Intelligence
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	Preface; Contents; Chapter 1: Complex Systems; 1.1 Introduction; 1.2 System Complexities; 1.3 System Transparency; 1.3.1 Black Boxes; 1.3.2 White Boxes; 1.3.3 Glass Boxes; 1.3.4 Grey Boxes; 1.4 System Classification; 1.5 Complex Agent Systems; 1.5.1 Multiagent Systems; 1.5.1.1 What Are Multiagent Systems; 1.5.1.2 Multiagent System Research Map; 1.5.2 Large-Scale Systems; 1.5.3 Large-Scale Multiagent Systems; 1.5.3.1 Concepts and Issues; 1.5.3.2 How Are ULS Systems Different? [40]; 1.5.3.3 Major Research Issues; 1.5.4 Open Complex Agent Systems; 1.5.4.1 Multiagent System Classification 1.5.4.2 Open Complex Agent Systems1.6 Hybrid Intelligent Systems; 1.6.1 Concept; 1.6.2 Hybridization Strategies; 1.6.3 Design Strategies; 1.6.4 Typical Hybrid Applications; 1.7 Evolution of Intelligent Systems; 1.8 Open Giant Intelligent Systems; 1.9 Computing and Engineering Complex Systems; 1.10 Summary; References; Chapter 2: Ubiquitous Intelligence; 2.1 Introduction; 2.2 Data Intelligence; 2.2.1 What Is Data Intelligence?; 2.2.2 Aims of Involving Data Intelligence; 2.2.3 Aspects of

Data Intelligence; 2.3 Domain Intelligence; 2.3.1 What Is Domain Intelligence?
2.3.2 Aims of Involving Domain Intelligence2.3.3 Aspects of Domain Intelligence; 2.4 Network Intelligence; 2.4.1 What Is Network Intelligence?; 2.4.2 Aims of Involving Network Intelligence; 2.4.3 Aspects of Network Intelligence; 2.5 Human Intelligence; 2.5.1 What Is Human Intelligence?; 2.5.2 Aims of Involving Human Intelligence; 2.5.3 Aspects of Human Intelligence; 2.6 Organizational Intelligence; 2.6.1 What Is Organizational Intelligence?; 2.6.2 Aims of Involving Organizational Intelligence; 2.6.3 Aspects of Organizational Intelligence; 2.7 Social Intelligence
2.7.1 What Is Social Intelligence?2.7.2 Aims of Involving Social Intelligence; 2.7.3 Aspects of Social Intelligence; 2.8 Metasynthesis of Ubiquitous Intelligence; 2.9 Summary; References; Chapter 3: System Methodologies; 3.1 Introduction; 3.2 Reductionism; 3.3 Holism; 3.4 Systematology; 3.5 Summary; References; Chapter 4: Computing Paradigms; 4.1 Introduction; 4.2 Objects and Object-Oriented Methodology; 4.3 Components and Component-Based Methodology; 4.4 Services and Service-Oriented Methodology; 4.5 Agents and Agent-Oriented Methodology; 4.5.1 Goal-Oriented Requirements Analysis
4.5.2 Agent-Oriented Software Engineering4.5.2.1 MaSE; 4.5.2.2 MESSAGE; 4.5.2.3 TROPOS; 4.5.2.4 GAIA; 4.5.3 Issues in Agent-Oriented Software Engineering; 4.6 Relations Among Agents, Objects, Components, and Services; 4.7 Autonomic Computing; 4.8 Organizational Computing; 4.9 Behavior Computing; 4.10 Social Computing; 4.11 Cloud/Service Computing; 4.12 Metasynthetic Computing; References; Chapter 5: Metasynthesis; 5.1 Introduction; 5.2 Open Complex Giant Systems; 5.3 OCGS System Complexities; 5.4 Knowledge and Intelligence Emergence; 5.5 Theoretical Framework of Metasynthesis
5.6 Problem-Solving Process in M-Space

Sommario/riassunto

Provides a comprehensive overview and introduction to the concepts, methodologies, analysis, design and applications of metasynthetic computing and engineering. The author: Presents an overview of complex systems, especially open complex giant systems such as the Internet, complex behavioural and social problems, and actionable knowledge discovery and delivery in the big data era. Discusses ubiquitous intelligence in complex systems, including human intelligence, domain intelligence, social intelligence, network intelligence, data intelligence and machine intelligence, and their synergy through metasynthetic engineering. Explains the concept and methodology of human-centred, human-machine-cooperated qualitative-to-quantitative metasynthesis for understanding and managing open complex giant systems, and its computing approach: metasynthetic computing. Introduces techniques and tools for analysing and designing problem-solving systems for open complex problems and systems. Metasynthetic Computing and Engineering of Complex Systems uses the systematological methodology in addressing system complexities in open complex giant systems, for which it may not only be effective to apply reductionism or holism. The book aims to encourage and inspire discussions, design, implementation and reflection of effective methodologies and tools for computing and engineering open complex systems and problems. Researchers, research students and practitioners in complex systems, artificial intelligence, data science, computer science, and even system science, cognitive science, behaviour science, and social science, will find this book invaluable.