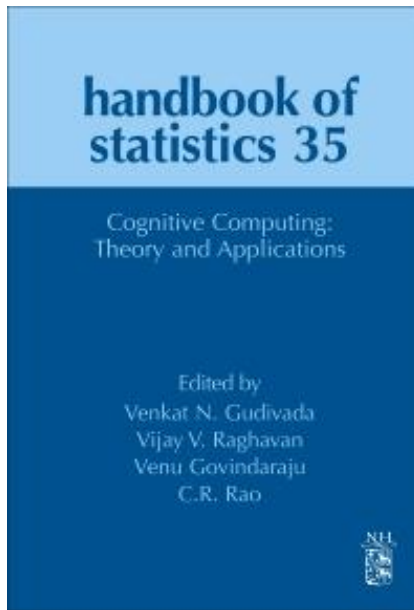# Cognitive Computing: Theory and Applications

BY V. N. GUDIVADA, V.V. RAGHAVAN, V. GOVINDARAJU, C.R. RAO (EDITORS) - ISBN: 978-0-4446-3744-4

REVIEWED BY WEIYI MENG

This is a timely book about an emergent discipline – cognitive computing. It actually belongs to an interdisciplinary domain encompassing cognitive science, neuroscience, data science, and high performance computing. The book provides an excellent coverage of two primary lines of research in this discipline. One is cognitive science which is a discipline that studies human mind and human cognition. This line of research covers neuroscience, psychology, linguistics, among others. The other line is largely based on computer science, especially the following subdisciplines: high-performance and cloud computing, machine learning, NLP, computer vision, information retrieval, data management and data science.

The book is comprised of 11 chapters written by 20 leading researchers in various relevant areas of cognitive computing. The first two chapters provide an excellent introduction to cognitive computing and set the stage for reading the rest of the book. They introduce key concepts, architectures and systems, principles and theorems, as well as recent advances in cognitive computing. The next five chapters present various concrete methods that can be applied to tackling cognitive computing problems. These methods include graph-based visual analytics, machine learning algorithms for cognitive analytics, random forest model based big data classification, and Bayesian additive regression tree. The final four chapters present in-depth case studies of four application areas that can benefit from research in cognitive computing: food-water-energy, education and learning, spoken language processing, and Internet of Things (IoT). The book strikes a good balance in breadth and depth in introducing the state-of-the-art of cognitive computing to the readers. The chapters I read are all very well written – rich in content, informative and up-to-date, and clear in writing.

This book can be easily adopted as a textbook for an advanced undergraduate or graduate course on cognitive computing. It will also be an excellent reference book for a number of computer science courses in the areas of data science, big data analytics, and machine learning. Researchers and practitioners who are interested in these areas can also benefit greatly from reading this book. I personally learned a lot from reading this book and I strongly recommend it.

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