Naoyuki Osaka, Ingo Rentschler, Irving Biederman (Eds.)

Object Recognition, Attention, and Action

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With 77 Figures

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Preface

Visual object recognition has been for years one of the most intensively studied subjects in cognitive science. It is only recently, however, that scientists have been able to investigate the neuronal processes possibly underlying this basic cognitive ability. Recent progress in cognitive/computational neuroscience and visual psychophysics has allowed further understanding of the neuronal and behavioral correlates associated with the different forms of object recognition.

This volume provides a comprehensive view of the neuronal and behavioral bases of object recognition, taking as its thesis that object recognition involves both active attention and coordinated action to adapt to the world. To fully understand human object recognition, therefore, we are required to examine its concept from the multidisciplinary point of view involving psychophysical research as well as cognitive and computational neuroscience of attentional mechanisms and action.

The collection of articles in this volume is produced on the basis of talks and in-depth discussions at the International Workshop on Object Recognition, Attention, and Action, organized by Naoyuki Osaka (Kyoto University, Japan) and Ingo Rentschler (University of Munich, Germany), and held at Kyoto University in 2004.

Leading researchers on object recognition believe that a firmer understanding of this topic is now within our reach because of new evidence from cognitive neuroscience, cognitive science, and neuropsychology. Accordingly, the neuronal system supporting object recognition seems to be in attentional networks connecting the visual brain with temporo-parietal cortex and even the prefrontal cortex. Furthermore, the coordination across various brain areas probably serves the purpose of binding purposeful action to the recognition task at hand. The present volume is to provide a forum for systematic comparison of present models and theories of object recognition in the brain. Thus, it aims at encouraging communication between students and researchers from different subdisciplines of cognitive science by focusing on explicit, detailed comparisons of current major approaches to object recognition theory and modeling. The domains in which the present contributors have examined the role of the neuronal basis of object recognition include higher brain mechanisms, attention, perception,

working memory, binding in the cerebral cortex, neural networks, and voluntary action.

As the book covers a wide range of different theoretical perspectives and interdisciplinary views, it will be of interest also to researchers and students in cognitive science/psychology, cognitive neuroscience, neuropsychology, neurobiology, artificial intelligence, and philosophy of the mind.

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Part II: Attention

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