ten by leading experts, and summarizes the state of the art.

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THE COMPUTATIONAL NEUROBIOLOGY OF REACHING AND POINTING: A FOUNDATION FOR MOTOR LEARNING. *Computational Neuroscience.*

By Reza Shadmehr and Steven P Wise. A Bradford Book. Cambridge (Massachusetts): MIT Press. $65.00. xix + 575 p; ill.; index. ISBN: 0–262–19508–9. 2005.

Can an entire book be devoted to a motor action as mundane as reaching for the morning coffee or pointing to give tourists directions? In fact, it can. As the book describes, reaching and pointing are outstanding behavioral tasks to examine sensorimotor function and to explore general principles of neurocomputation. On the sensory side, reaching requires sensory integration, usually proprioceptive and visual, to identify limb position and targets in the environment. On the motor side, reaching involves coordination of shoulder and elbow muscles to move the hand in space, considering both the complex physics of multijoint movement and external forces applied to the limb. On the cognitive side, reaching can be elicited under many contexts from simple stimulus-driven to arbitrary external cues (red means right), or can be purely self-initiated. There has been an enormous amount of research on this topic over the last 20 years and, thus, an overview of these advances is extremely timely.

A strength of this volume is that it explores reaching and pointing from many perspectives, reflecting the complementary expertise of the two authors. Although both are clear leaders in the field, each appears to have somewhat different writing styles and ways of organizing the material, decreasing the cohesiveness of the book. In most cases, the material is presented as brief descriptions of important studies on a given topic. A valuable feature is the use of mathematical descriptions of key steps in planning and controlling movement to help readers understand the associated experimental results. Rather than ignoring controversial issues, the authors clearly state where disagreements exist, providing considerable balance to articulate differing opinions.

The book begins with a number of broad topics. It describes how evolutionary forces transformed the motor system, initially capable of rudimentary locomotor patterns by primitive fish, into reaching and grasping actions by ancestral primates. This is followed by a brief review of the anatomy and physiology of the musculoskeletal system and the highly distributed neural circuits involved in sensorimotor function and motor learning. Amusingly, a volume subtitled *A Foundation for Motor Learning* explicitly avoids defining motor learning, preferring to recognize the fuzzy boundaries inherent in this biological term.

Several key issues are extensively addressed. The first, related to motor planning, involves the calculation of a difference vector that specifies target location relative to hand position in eye-centered coordinates. Several chapters are dedicated to describing behavioral and neurophysiological evidence on how and where this calculation is generated in the cerebral cortex. The second major area relates to the execution of reaching, including its kinematic and kinetic features, the neurophysiological basis of online control, as well as adaptive processes for learning new motor skills.

Overall, this volume provides a comprehensive description of the mathematical, behavioral, and neurophysiological basis of reaching. It is an excellent textbook for graduate students and neophytes to this field, and will be a valuable resource for seasoned veterans who need a quick refresher or an update on specific topics.

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ANNUAL REVIEW OF NEUROSCIENCE. *Volume 28: 2005.*

Edited by Steven E Hyman, Thomas M Jessell, Carla J Shatz, and Charles F Stevens. Palo Alto (California): Annual Reviews. $79.00. x + 599 p; ill.; subject index and cumulative indexes (contributing authors and chapter titles, Volumes 19–28). ISBN: 0–8243–2428–5. 2005.

NEUROSCIENCE. *Third Edition.*

Edited by Dale Purves, George J Augustine, David Fitzpatrick, William C Hall, Anthony-Samuel LaMantia, James O McNamara, and S Mark Williams. Sunderland (Massachusetts): Sinauer Associates. $86.95. xix + 773 p + G-1–G-16 + SR-1–SR-6 + I-1–I-15; ill.; index. ISBN: 0–87893–725–0. [CD-ROM included.] 2004.

This textbook is oriented toward human neuroscience for upper-level undergraduate, beginning graduate, or medical students. It is very well written, with a constant, clear tone throughout. It is moderately comprehensive, covering the physiology and cell biology of neurons in the beginning of the volume, and then moving on to the anatomy and physiology of the major functional areas of the brain. Sections of the book are devoted to sensory