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Yasushi Mae, and Tatsuo Arai Biomechanical Characterization of Human Red Blood Cells with Optical Tweezers; Youhua Tan, Dong Sun, and Wenhao Huang Nanorobotic Manipulation for a Single Biological Cell; Toshio Fukuda, Masahiro Nakajima, and Mohd Ridzuan Ahmad Measurement of Brain Activity Using Optical and Electrical Methods ; Atsushi Saito, Alexsandr Ianov, and Yoshiyuki Sankai Bowel Polyp Detection in Capsule Endoscopy Images with Color and Shape Features; Baopu Li and Max Q.-H. Meng Classification of Hand Motion Using Surface EMG Signals; Xueyan Tang, Yunhui Liu, Congyi Lu, and Weilun Poon Multifunctional Actuators Utilizing Magnetorheological Fluids for Assistive Knee Braces; H. T. Guo and W. H. Liao Mathematical Modeling of Brain Circuitry during Cerebellar Movement Control; Henrik Jorntell, Per-Ola Forsberg, Fredrik Bengtsson, and Rolf Johansson Development of Hand Rehabilitation System Using Wire-Driven Link Mechanism for Paralysis Patients; Hiroshi Yamaura¹, Kojiro Matsushita, Ryu Kato, and Hiroshi Yokoi A Test Environment for Studying the Human-Likeness of Robotic Eye Movements Index

Sommario/riassunto

Biologically inspired robotics is an interdisciplinary subject between robotics and biology that involves how to apply biological ideas and phenomena to engineering problems in robotics (biomimetics), and how to apply robotics technology to understanding of biological systems and their behaviors (bio-robotic modeling/analysis). The efforts in biologically inspired robotics are not just restricted to research work in laboratories, their novel applications are also being extensively explored in services, education, rehabilitation, medical care and other sectors. The objective of this book is to introduce the latest efforts in research of biologically inspired robotics, covering both biomimetics (with chapters in biologically inspired robot design and control, bio-sensing, bio-actuation, and micro/nano bio-robotic systems) and bio-robotic modeling/analysis (discussing human hand motion recognition using biological signals, modeling of human brain activities, characterization of cell properties using robotic systems). In order to provide readers a better understanding on organization of this book, the content is classified into four parts: (1) biologically inspired robot design and control, (2) micro/nano bio-robotic systems, (3) biological measurement and actuation, and (4) applications of robotics technology to biological problems--