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Nota di contenuto	Biohybrid Systems: Nerves, Interfaces, and Machines; Contents; Preface; List of Contributors; 1 Merging Technology with Biology; 1.1 Introduction; 1.2 NeuroDesign; 1.3 The NeuroDesign Approach; 1.4 Neuromorphic Control of a Powered Orthosis for Crutch-Free Walking; 1.5 Frontiers of Biohybrid Systems; 1.6 Chapter Organization; References; 2 Principles of Computational Neuroscience; 2.1 Introduction; 2.2 Some Physiology of Neurons; 2.2.1 Membrane Potential; 2.2.2 Membrane Equivalent Circuit; 2.2.3 Action Potential: Generation and Propagation; 2.3 General Formalisms in Neuronal Modeling 2.3.1 Conductance-Based Hodgkin-Huxley Model for Action Potential Generation 2.3.2 Chemical and Electrical Synaptic Inputs; 2.3.3 Cable Theory of Neuronal Conduction and Compartmental Modeling; 2.3.4 Calcium and Calcium-Dependent Potassium Currents; 2.3.5 Simplified Neuronal Models; 2.4 Synaptic Coupling and Plasticity; 2.4.1 Modeling

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#### Sommario/riassunto

The discipline of neurodesign is a highly interdisciplinary one, while at the same time in the process of maturing towards real-life applications. The breakthrough about to be achieved is to close the loop in communication between neural systems and electronic and mechatronic systems and actually let the nervous system adapt to the feedback from the man-made systems. To master this loop, scientists need a sound understanding of neurology, from the cellular to the systems scale, of man-made systems and how to connect the two. These scientists comprise medical scientists, neurologists and physio

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