



# Biohybrid Systems: Nerves, Interfaces and Machines

*From Wiley-VCH*



## **Biohybrid Systems: Nerves, Interfaces and Machines** From Wiley-VCH

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 physiologists, engineers, as well as biophysicists. And they need the topics in a coherently written work with chapters building upon another.

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### Editorial Review

#### Review

“This text offers a detailed overview of recent advances in biohybrid systems interfacing nerves, muscles and machines ... The chapters are well written and despite being a multi-authored work there is little repetition and good links to other sections.” (*Electrodiagnostics and Clinical Engineering*, 2012)

#### From the Back Cover

The integration of technology with biology is making us more productive in the workplace, enabling medical devices to be more effective, and making our entertainment systems more engaging. Our lives are changing as biology and technology merge to form biohybrid systems. Real-time communication between a nervous system and a device is now possible. But full and reliable integration is still far from reality. This book describes several recent advances and some of the key challenges faced by engineers and scientists developing biohybrid systems that interface nerves, muscles and machines.

#### Topics include:

- Merging Technology with Biology
- Principles of Computational Neuroscience
- Neuromorphic Electronic Design
- Principles of Neural Signal Processing
- Dynamic Clamp in Biomimetic and Biohybrid Living- Hardware Systems
- Biohybrid Circuits: Nanotransducers Linking Cells and Neural Electrodes
- Hybrid Systems Analysis: Real- time Systems for Design and Prototyping of Neural Interfaces and Prostheses
- Biomimetic Adaptive Control Algorithms
- Neuromorphic Hardware for Control
- Biohybrid Systems for Neurocardiology
- Bioelectronic Sensing of Insulin Demand

#### About the Author

Ranu Jung holds the Wallace H. Coulter Eminent Scholars Chair in Biomedical Engineering at Florida International University, USA where she is Professor and Chair of the Biomedical Engineering Department. She joined Florida International in 2011 from Arizona State University where she was founding co-director of the Center for Adaptive Neural Systems. She has also co-founded Advensys LLC, a small business R&D company and previously was President of the Organization for Computational Neurosciences, Inc. a non-profit that serves a global community of computational neuroscientists. Jung received her first degree in Electronics & Communication Engineering from National Institute of Technology-Warangal, India and her Masters and Doctorate degrees in Biomedical Engineering from Case Western Reserve University, USA. She is actively engaged in the development of neurotechnology that is inspired by biology, is adaptive and could be used to promote adaptation in the nervous system to overcome neurological disability or trauma.

## **Users Review**

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#### **Cheryl Phelps:**

Do you have favorite book? Should you have, what is your favorite's book? E-book is very important thing for us to know everything in the world. Each book has different aim or goal; it means that e-book has different type. Some people truly feel enjoy to spend their time for you to read a book. They are reading whatever they get because their hobby will be reading a book. How about the person who don't like looking at a book? Sometime, man feel need book after they found difficult problem or exercise. Well, probably you will want this Biohybrid Systems: Nerves, Interfaces and Machines.

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#### **Sherrie Beardsley:**

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