Brain-Computer Interfacing for Assistive Robotics: Electroencephalograms, Recurrent Quantum Neural Networks, and User-Centric Graphical Interfaces

Vaibhav Gandhi
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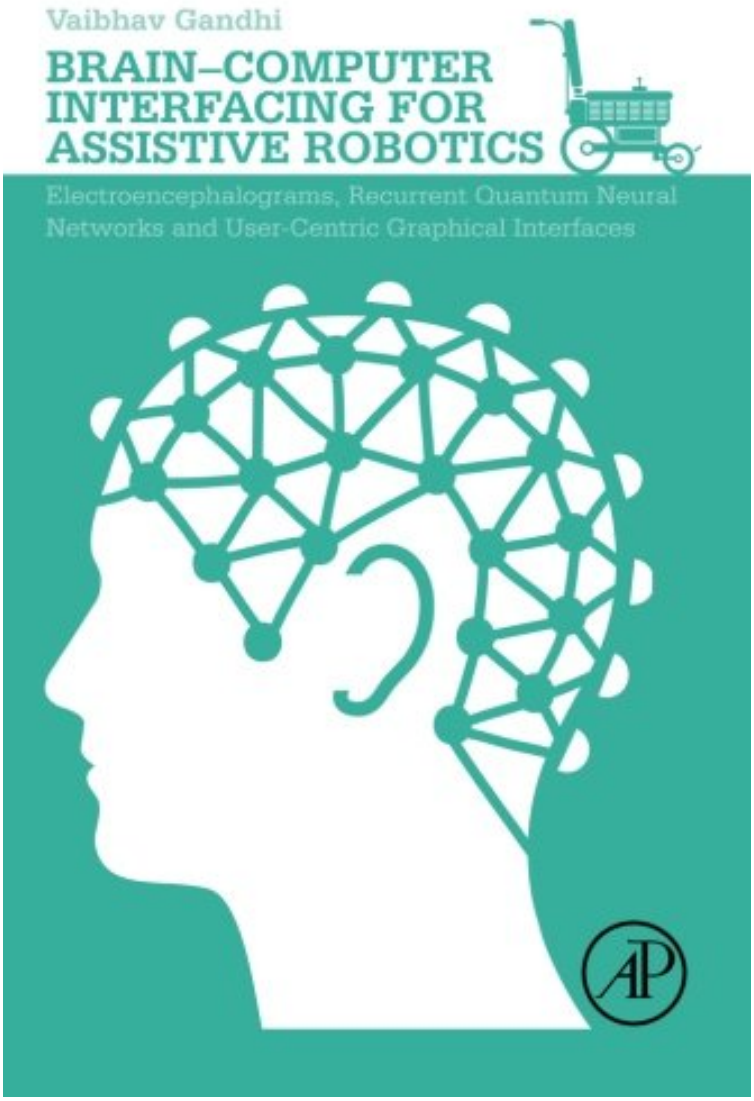

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Vaibhav Gandhi : Brain-Computer Interfacing for Assistive Robotics: Electroencephalograms, Recurrent Quantum Neural Networks, and User-Centric Graphical Interfaces before purchasing it in order to gage whether or not it would be worth my time, and all praised Brain-Computer Interfacing for Assistive Robotics:

Electroencephalograms, Recurrent Quantum Neural Networks, and User-Centric Graphical Interfaces:

Brain-computer interface (BCI) technology provides a means of communication that allows individuals with severely impaired movement to communicate with assistive devices using the electroencephalogram (EEG) or other brain signals. The practicality of a BCI has been possible due to advances in multi-disciplinary areas of research related to cognitive neuroscience, brain-imaging techniques and human-computer interfaces. However, two major challenges remain in making BCI for assistive robotics practical for day-to-day use: the inherent lower bandwidth of BCI, and how to best handle the unknown embedded noise within the raw EEG. Brain-Computer Interfacing for Assistive Robotics is a result of research focusing on these important aspects of BCI for real-time assistive robotic application. It details the fundamental issues related to non-stationary EEG signal processing (filtering) and the need of an alternative approach for the same. Additionally, the book also discusses techniques for overcoming lower bandwidth of BCIs by designing novel use-centric graphical user interfaces. A detailed investigation into both these approaches is discussed.An innovative reference on the brain-computer interface (BCI) and its utility in computational neuroscience and assistive roboticsWritten for mature and early stage researchers, postgraduate and doctoral students, and computational neuroscientists, this book is a novel guide to the fundamentals of quantum mechanics for BCIFull-colour text that focuses on brain-computer interfacing for real-time assistive robotic application and details the fundamental issues related with signal processing and the need for alternative approachesA detailed introduction as well as an in-depth analysis of challenges and issues in developing practical brain-computer interfaces.

About the AuthorVaibhav Gandhi (author) received a First Class (Dist.) degree in Instrumentation Control engineering in 2000, a First Class (Dist.) Masters degree in Electrical engineering in 2002 and a Ph.D. degree in Computing Engineering in 2012. He was a recipient of the UK-India Education Research Initiative (UKIERI) scholarship for his Ph.D. research in the area of Brain-Computer Interface for assistive robotics carried out at the Intelligent Systems Research Center, University of Ulster, UK and partly at IIT Kanpur, India. His Ph.D. focused on quantum mechanics motivated EEG signal processing, and an intelligent adaptive use-centric human-computer interface design for real-time control of a mobile robot for BCI users. His post-doctoral research involved work on shadow-hand multi-fingered mobile robot control using EMG/muscle signals, with contributions in the 3D printing aspects of a robotic hand.He joined the department of Design Engineering Mathematics, School of Science Technology, Middlesex University London in 2013, where he is currently Lecturer in Robotics, Embedded Systems and Real-time Systems.His research interests include brain-computer interfaces, biomedical signal processing, computational intelligence and neuroscience, use-centric graphical user interfaces, and assistive robotics.