

Mind-Brain-Machine Interface with Neural Microsystems

GUEST SPEAKER

Prof. Nitish V. Thakor
Biomedical Engineering
Electrical and Computer Engineering
Neurology
Johns Hopkins University, Baltimore, USA

When: **21st October 2010, 9.30 a.m. to 10.30 a.m.**

Where: **Institute of Microelectronics, Singapore**
11 Science Park Road Singapore Science Park II Singapore 117685

Abstract

Neuroengineering is an emerging field that synergistically combines the disciplines of neurosciences and engineering to solve significant problems, either basic or clinical. One such example is that of development of neural prosthesis, sponsored through a DARPA-funded program. Development of neural prosthesis requires many technological initiatives that include development of microelectrode array, VLSI circuits, overall prosthetic/ robotic instrumentation, and very importantly, signal processing and algorithms for decoding brain's signals. I will present an overview of the neural prosthesis project and then present some state-of-the-art examples of electrodes, circuits, algorithms and application to neural prosthesis in basic lab and clinical/human studies. I will conclude with future directions that also include electrical, chemical and optical methods for brain machine interface. The large scope of such program will require an extensive collaborations in a centre/institute dedicated to such major initiatives or extensive multidisciplinary collaborations.

About the Speaker



Prof. Nitish V. Thakor is a Professor of Biomedical Engineering, Electrical and Computer Engineering, and Neurology at Johns Hopkins University. He currently directs the Laboratory for Neuroengineering at Johns Hopkins University, School of Medicine. He established and managed the Laboratory for Medical Instrumentation and Neuroengineering at the Johns Hopkins School of Medicine with the aim of carrying out interdisciplinary and collaborative engineering research for basic and clinical neurosciences. His technical expertise is in the areas of neural diagnostic instrumentation, neural signal processing, optical and MRI imaging of the nervous system, micro and nanoprobe for neural sensing, brain computer interface and neural prosthesis. He carries out research on hypoxic-ischemic brain injury and traumatic brain injury in basic experimental models and also directs collaborative technology development programs on monitoring patients with brain injury in neurocritical care settings and the development of next generation neurally controlled upper limb prosthesis. His research is currently funded by the National Institutes of Health (NIH), National Science Foundation (NSF), DARPA and other sources. He has published more than 200 refereed journal papers, edited one book, and generated 11 patents. Dr. Thakor also actively participates in translational activities having co-founded 3 medical device companies.

He is the Editor in Chief of IEEE Transactions on Neural and Rehabilitation Engineering and the Director of a Neuroengineering Training program funded by the National Institute of Biomedical Imaging and Bioengineering, a multi-disciplinary and collaborative training program for doctoral students. He has supervised more than 50 graduate students and as many post doctoral fellows and research faculty over more than two decades and placed them at major academic and industrial positions internationally. He has organized and chaired dozens of special conferences, workshops and theme and symposia and national and international conferences, given more than 25 keynote or plenary talks, and has been invited to participate in or chair workshops and vision/strategic planning meetings by NIH, NSF and DARPA. Dr. Thakor is a recipient of a Research Career Development Award from the NIH and a Presidential Young Investigator Award from the NSF, and is a Fellow of the American Institute of Medical and Biological Engineering, IEEE and Founding Fellow of the Biomedical Engineering Society. He is also a recipient of the Technical Achievement in Neural Engineering award from IEEE Engineering in Medicine and Biology Society, the Centennial Medal from the University of Wisconsin School of Engineering and a Distinguished Alumnus Award from the Indian Institute of Technology, Bombay, India. He is an Honorary Member of the Alpha Eta Mu Beta Biomedical Engineering student Honor Society.

Registration

Pre-registration is required. Closing date is 20th October 2010. To register, please log on:

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