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Development and application of bio-impedance tomography (EIT/MIT/MMT)

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Several noninvasive modalities including electrical impedance tomography (EIT) and magnetic induction tomography (MIT) have been developed for imaging the electrical conductivity distribution within a conductive body. In this presentation, a brief introduction to the technology will be given including innovative applications of those technologies in many different sectors as well as hybrid approaches like multi-modal tomography (MMT), combined ultrasound and EIT, and combined ultrasound and MIT. Advantages of EIT and MIT are portable, low-cost, non-invasive, low-risk to a body, and its ability to characterizing biological tissues or biological objects through spectroscopy. They are well suitable for both biomedical and industrial applications to assist healing, feeding and processing. MIT and EIT have been proposed for numerous medical applications such as stroke and lung imaging. Non-medical applications of MIT and EIT include industrial process monitoring, security, geophysical exploration, non-destructive testing of materials and multi-phase flow monitoring in oil pipe-lines and many more.

Thurs Sept 29, 2011

admission is free

18:00 – 19:30 pm
ME-4342
Carleton University

Dr. Mamatjan received the B.Sc from Nanjing University, China in 1999, the M.Sc. from both Chalmers University of Technology in 2003 and Jönköping University in 2005 from Sweden. He obtained his PhD in Medical Electronics from University of Glamorgan, UK in 2009. He was a researcher at Saab in Sweden and a Marie Curie Research Fellow/senior research scientist at Philips research laboratory in Germany. He had made research visits at core research labs in Italy and France. Currently, he is a postdoctoral fellow at the Carleton University in biomedical engineering under Professor Andy Adler.

He has been involved in multi-disciplinary research in both industry and academia in designing wearable hardware architecture with wireless sensors (Smart Clothes) to process tomography (multi-phase flow oil-water monitoring) to bio-impedance tomography using MIT (Magnetic Induction Tomography) and EIT (Electrical Impedance Tomography). He is currently working on improving electrical impedance tomography (EIT) algorithms. His research interests are in the areas of electrical impedance tomography (EIT) and other imaging modalities – MIT, EEG and CT.

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