

Invited Speakers (Tentative)

1. Low Voltage DC powered ICT Systems for Schools and Offices.

By Dr. Matt Stewart, University of Liverpool

Abstract:

The worldwide market for DC technologies in buildings is estimated to exceed \$10 billion by 2020. This talk introduces the IET's new code of practice for Low Voltage DC systems in buildings as a design guide and compliance document and presents case study results of an integrated system featuring safe smart LVDC distribution to computing appliances in an IT classroom in an urban London School. Power supply for this integrated LVDC and computing network is described as a dedicated local roof mounted PV array with local energy management capability provided to minimize impact on the local grid. Results of this operational case study demonstrate a wide range of benefits of LVDC systems in application to computing and Information and Communication Technology (ICT) intensive environments such as schools, colleges and commercial buildings.

Short Biography



Dr Matt Stewart (MIET) gained his academic qualifications in fields of Systems Integration and Control, Power Engineering, and Electrical and Mechanical Engineering at University of Strathclyde. He was a member of Technology Strategy Board's Smart DC Special Interest Group Steering Committee and is co-inventor of Building Research Establishment's patented carbon minimization technology for ICT fleets in buildings. Dr Stewart is now a Research Associate in Department of Electrical Engineering and Electronics at University of Liverpool in the UK developing novel fully integrated systems featuring Combined Heat and Power (CHP) with low voltage DC networks.

2. EEG Complex Grasping Patterns Recognition for BMI Robotic and Prosthesis Motion Control

By Ebrahim A. Mattar, College of Engineering, University of Bahrain, P.O. Box 32038, Kingdom of Bahrain, ebmattar@uob.edu.bh

Abstract:

Recently, there are tremendous efforts and research directions to use Brainwaves signals and their associated patterns for Robotic-Prosthesis applications. However, due to the complexity of such brain patterns, making use of such patterns for practical grasping learning Robotic-Prosthesis is not a trivial task. In this context, this paper will be focusing on decoding and learned patterns of neural waves for grasping applications. This is based on using MBI (Machine Brain Interface) for motorizing and controlling a Robotic- prosthesis. The paper will be focusing on dealing with massive interrelated waves, and how PCA learning patterns are used for such learning.

Short Biography



E. Mattar. Has BSc., Studied MSc., Ph.D., Gulf Executive Program MBA. IET, IEEE member, and IFAC affiliated. University of Bahrain Associate Prof. of Cybernetics and Robotics, and Bahrain IET LN H. Chair. Currently University of Bahrain Assoc. Prof. of Cybernetics and Robotics, and a candidate for the full rank. Career pathway, back on 1986 as received University of Bahrain Bachelor of Science in Electrical Eng., pursued studies for MSc. In Electronics in 1988, University of Southampton, 1994 awarded University of

Reading Ph.D. in Cybernetics, Robotics Control. Worked on (13) research projects, including King Saud University Robotics Project, KSA. Supervised a number of (Ph.D., M.Sc., Undergraduate) students, and currently working towards Brainwaves decoding and learning for robotics hand control. Editor board member of (16) journal and conference, and a reviewer. Awarded (21) awards, University of Bahrain, best research in 2001, 2002, 2006, and 2007, Bahrain Police Academy Award (2012), and others research related awards. Back in 2001 with

30 others from Gulf Region, chosen for the Gulf Executive Program conducted in USA, and received MBA from Darden School, Virginia University. Holds other short qualifications after as well. Have interests in Cybernetics, Robotics, Computational Intelligence, and Control. Lecturing within such areas. Chairing Continuing Engineering Education Dept., (1998-2002). Chairing Electrical and Electronics Engineering Dept., (2004-2009) and (2011-2013), University of Bahrain. During 2011-2013, was seconded to Bahrain Training Institute, as the Institute Director General. Headed large number of committees, including ABET accreditation committee for 3 terms, 2005-2014. ABET accreditation expert, as leading a team for positive full Electrical Engineering and Electronics Engineering Programs accreditation over 2005-2010, and over 2010-2014. Run (20) Engineering and Educational short courses and workshops in the area of robotics, control-automation. ANN, Matlab, Mathematica, Labview, LaTeX, IMSL, and NAG libraries. Member of Bahrain NATIONAL Higher Education Skills-Innovation Steering Committee. IET active member and member of IEEE, IFAC and BSE. Organizing chair of 2 large conferences, technical events, and 8 IET symposiums-colloquiums. Computations Skills: C, C++, Mathematica, MatLab, LabView, NAG Library and LaTeX ..., OS, Unix, Windows.

3. Human Cognition Inspired Learning Strategies for Particle Swarm Optimization Algorithm

By M.R. Tanweer, S. Sureshand N. Sundararajan
Nanyang Technological University, Singapore

Abstract: These days, the nature of global optimization problems especially for engineering systems have become extremely complex and difficult to locate the true optimum solutions. For these types of problems, finding the optimal/near-optimal solution in a quick and efficient way is very important and here only search based methods are found to be effective. Among the search based methods, nature inspired optimization algorithms are providing much better solutions. A well-known nature inspired method, the Particle Swarm Optimization (PSO) algorithm has been mostly preferred due to its simplicity and ability to provide better solutions and it has been proven to be more effective for solving complex real-world problems. The limitations associated with PSO have been extensively researched and different modifications, variations and refinements to PSO have been proposed for enhancing the performance of the

algorithm. These include parameter tuning, neighborhood topologies and unique learning strategies. The PSO variants with unique learning strategies are found to be more effective in enhancing the convergence characteristics of the basic PSO algorithm. All these variants have utilized the behavior of the swarm which limited the usage of intelligence and motivated towards exploring human cognitive learning principles for PSO.

As discussed in learning psychology, human beings are known to be intelligent and have good social cognizance. Therefore, any optimization technique employing human-like learning strategies should prove to be more effective. In this talk, first the basic PSO and its different variants will be presented to show the status of current work. Then the human cognition inspired learning strategies will be introduced to address the limitations of PSO and enhancing its convergence characteristics. By mimicking the human-like behaviour the PSO algorithm has shown faster convergence closer to the optima over diverse set of problems successfully being a potential choice for complex real-world applications. Recent developments in this area undertaken by our group will be highlighted.

Presenter: Dr. Narasimhan Sundararajan, Fellow IEEE, NTU Singapore

Short biography



Dr. Sundararajan worked in the Indian Space Research Organization, Trivandrum, India starting as a Control System Designer to Director, Launch Vehicle Design Group contributing to the design and development of the Indian satellite launch vehicles SLV3, ASLV, PSLV and GSLV. He worked as the Project Engineer (Mission) for the first Indian Satellite Launch Vehicle project SLV3 team working directly under Dr. Kalam. He was also a NRC Research Associate at NASA - Ames in 1974 and a Senior NRC Research Associate at NASA Langley in 1981-86 under the National Academy of Sciences, USA program. From February 1991, he was working in the School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore, as a Professor and has retired from that position in July 2010. He is also an emeritus visiting professor at the Indian Institute of Space Science and Technology, Trivandrum, India.

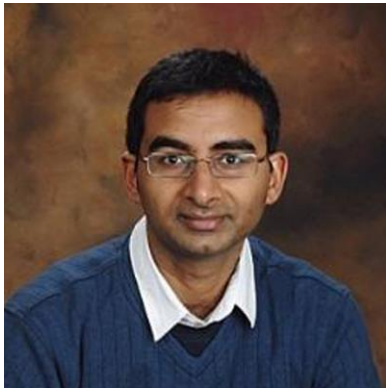
4. Powering Satellites

By Dr. Debrup Hui, Center for Atmospheric and Space Sciences, Department of Physics
Utah State University, Logan, Utah, USA

Abstract:

When we are busy studying how power can be generated and transported to the point of consumption across the nation and borders, how do satellites at different distances from the Sun and the Earth get power for their long life span. Powering satellites need cutting edge knowledge and highest efficiency in both generation and optimized utilization. This talk is a basic introduction to the field of science and technology of powering satellites. We will focus on different modes of generating power locally on board satellites and how the power budget is optimized.

Short Biography: Dr. Debrup Hui did M.Sc. in Electronics (University of Calcutta, India),



M. Sc. in Physics (University of Texas at Arlington, USA), M. Sc. in Electrical Engg (Utah State University, USA), and then PhD in Physics (Utah State University, USA). His research area includes “Powering satellites”, communication, etc.

5. Industrial Automation: modern trends

By Mr. Debrabrata Sarkar,
Kentz, Dubai