

IEEE CIS Distinguished Lecture Program by Prof. Saman K. Halgamuge, The University of Melbourne

Hosted by: *Department of Information Technology, RCCIIT, Kolkata*

Event date: 6th May, 2019
Time: 11:30 AM to 1:00 PM
Location: RCC Institute of information Technology, Kolkata, India
Attendance: 33

Title of talk:
Unsupervised Deep Learning meets Bioinformatics and Neural Engineering

Abstract:

We have been working on the application of Computational Intelligence (CI) in invitronneuronal network behaviour patterns that can be used to cluster drugs for brain deceases and in applications in Metagenomics. In lab experiments involving multiple drugs applied to live brain tissues, vast amount of data can be generated using Multiple Electrode Array (MEA) technology.

We use an extended version of Self Organizing Map (SOM), which is one of the widely used Unsupervised Neural Networks. It has the ability to map high dimensional characteristics or data from multiple drugs into a two dimensional feature map, which is expected to be topology preserving allowing users to visually identify clusters. Our extended methods including Growing Self Organizing Maps (GSOM) further allow the map size to be determined by the algorithm, which relies upon a user set parameter called "Spread Factor" (SF). Using GPU compatible implementation of GSOM, we can vary SF and obtain multiple GSOMs from a small number of compact clusters to a large number of sparse clusters.

Brief Bio of Speaker:

SAMAN HALGAMUGE, FIEEE is a Professor in the Department of Mechanical Engineering, School of Electrical, Mechanical and Infrastructure Engineering at the University of Melbourne, an honorary Professor of Australian National University (ANU) and an honorary member of ANU Energy Change Institute. He was previously the Director of the Research School of Engineering at the Australian National University (2016-18), Professor, Associate Dean International, Associate Professor and Reader and Senior Lecturer at University of Melbourne (1997-2016). He graduated with Dipl.-Ing and PhD degrees in Data Engineering from Technical University of Darmstadt, Germany and B.Sc. Engineering from University of Moratuwa, Sri Lanka. He has been a frequent visitor to India and delivered research seminars at IISc in Bangalore and IITs Kanpur, Kharagpur, Bombay and Madras. He was also the founding Director of Melbourne India Postgraduate Program at University of Melbourne.

His research interests are in Machine Learning including Deep Learning, Big Data Analytics and Optimization and their applications in Energy, Mechatronics, Bioinformatics and Neuro-Engineering. His fundamental research contributions are in Big Data Analytics with Unsupervised and Near Unsupervised type learning as well as in

transparent Deep Learning and Bioinspired Optimization. His h-index is 40 (8500 citations) in Google Scholar and he graduated 50 PhD students and obtained significant research funding from industry and prestigious research funding organisations.

List of Participants:

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8	Tulika Dutta		
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13	Dr.Tathagata Deb	RCC Institute of Information Technology, Kolkata	
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18	Surajit Dutta	Authentech Software	
19	Arindam Mondal	RCC Institute of Information Technology, Kolkata	
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30	Dr. Ashoke Mondal	RCC Institute of Information Technology	
31	Mr. Hiranmoy Roy	RCC Institute of Information Technology	
32	Mr. Soumyadip Dhar	RCC Institute of Information Technology	
33	Mr. Sudipta Hazra	Swami Vivekanda Institute of Engineering and Technology	

Glimpses of the Event:

