

Report on IEEE Distinguished Lecturer Jun Wang's Talk

IEEE Computational Intelligence Chapter (IEEE NZ Central Section)

Chapter Chair: Mengjie Zhang; Secretary: Bing Xue

On Wednesday 23 November 2016 at 3:10-4:30pm in Cotton Building CO 350 at Victoria University of Wellington, the IEEE Computational Intelligence Chapter (IEEE New Zealand Central Section) had IEEE Distinguished Lecturer, Prof Jun Wang from City University of Hong Kong, delivered an exciting talk on "The State of the Art of Neurodynamic Optimization: Past, Present, and Prospects --- Collaborative Neurodynamic Optimisation Approaches to Constrained Optimisation". This talk attracted 39 people of IEEE members, academics, research students, and people from industry. After the seminar, a good discussion was held between the attendees and Prof Wang. Using his 30 years of experience on computational intelligence (particularly neural networks and evolutionary computation), Prof Wang discussed the state of the art of neural networks in scientific research and engineering applications, how neural systems can be optimised, and how to interact neural systems with evolutionary computation techniques.

IEEE NZ Central Section helped our CIS chapter advertise this event in the section, and financially supported \$400 for this event for part of the local cost. The Chair's School (Victoria University of Wellington) and research grants cover the rest of the local cost.

Some pictures in the talk are presented below.





The details of the talk with an abstract is attached below.

Title: The State of the Art of Neurodynamic Optimization: Past, Present, and Prospects --- Collaborative Neurodynamic Optimisation Approaches to Constrained Optimisation

Date: 23 November 2016

Time: 3:10-4:30pm

Speaker: Jun Wang, City University of Hong Kong, IEEE Fellow, IEEE Distinguished Lecturer

Venue: CO350, Victoria University of Wellington, Kelburn Campus

Host: IEEE NZ Central Section CIS Chapter

Abstract: As an important tool for science research and engineering applications, optimization is omnipresent in a wide variety of settings. It is computationally challenging when optimization procedures have to be performed in real time to optimize the performance of dynamical systems. For such applications, classical optimization techniques may not be competent due to the problem dimensionality and stringent requirement on computational time. New paradigms are needed. One very promising approach to dynamic

optimization is to apply artificial neural networks. Because of the inherent nature of parallel and distributed information processing in neural networks, the convergence rate of the solution process is not decreasing as the size of the problem increases. This talk will present the state of the art of neurodynamic optimization models and selected applications. Specifically, starting from the motivation of neurodynamic optimization, we will review various recurrent neural network models for optimization. Theoretical results about the stability and optimality of the neurodynamic optimization models will be given along with illustrative examples and simulation results. It will be shown that many computational problems can be readily solved by using neurodynamic optimization approaches.

Biography: Jun Wang is the Chair Professor Computational Intelligence in the Department of Computer Science at City University of Hong Kong. Prior to this position, he held various academic positions at Dalian University of Technology, Case Western Reserve University, University of North Dakota, and the Chinese University of Hong Kong. He also held various short-term visiting positions at USAF Armstrong Laboratory,



RIKEN Brain Science Institute, Dalian University of Technology, Huazhong University of Science and Technology, and Shanghai Jiao Tong University (Changjiang Chair Professor). He received a B.S. degree in electrical engineering and an M.S. degree in systems engineering from Dalian University of Technology and his Ph.D. degree in systems engineering from Case Western Reserve University. His current research interests include neural networks and their applications. He has published about 200 journal papers, 15 book chapters, 11 edited books, and numerous conference papers in these areas. He is the Editor-in-Chief of the IEEE Transactions on Cybernetics. He also served as an Associate Editor of the IEEE Transactions on

Neural Networks (1999-2009), IEEE Transactions on Cybernetics and its predecessor (2003-2013), and IEEE Transactions on Systems, Man, and Cybernetics – Part C (2002-2005), as a member of the editorial board of Neural Networks (2012-2014), editorial advisory board of International Journal of Neural Systems (2006-2013). He was an organizer of several international conferences such as the General Chair of the 13th International Conference on Neural Information Processing (2006) and the 2008 IEEE World Congress on Computational Intelligence, and a Program Chair of the IEEE International Conference on Systems, Man, and Cybernetics (2012). He has been an IEEE Computational Intelligence Society Distinguished Lecturer (2010-2012, 2014-2016). In addition, he served as President of Asia Pacific Neural Network Assembly (APNNA) in 2006 and many organizations such as IEEE Fellow Committee; IEEE Computational Intelligence Society Awards Committee; IEEE Systems, Man, and Cybernetics Society Board of Governors. He is an IEEE Fellow, IAPR Fellow, and a recipient of an IEEE Transactions on Neural Networks Outstanding Paper Award and APNNA Outstanding Achievement Award in 2011, Neural Networks Pioneer Award from IEEE Computational Intelligence Society (2014), among others.