

Plenary Speech—Philip Chen (China)

Broad learning: An effective and efficient incremental

learning without the need for deep structure



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ABSTRACT

In recent years, deep learning caves out a research wave in machine learning. With outstanding performance, more and more applications of deep learning in pattern recognition, image recognition, speech recognition, and video processing have been developed. The talk is to introduce “Broad Learning” – a very fast and accurate learning without deep structure. Without stacking the layer-structure, the designed neural networks expand the neural nodes broadly and update the weights of the neural networks incrementally when additional nodes are needed and when the input data entering to the neural networks continuously. The designed network structure and incremental learning algorithm are perfectly suitable for modeling and learning big data environment. Experiments indicate that the designed structure and algorithm out-perform existing structures and learning algorithms.

ABOUT THE SPEAKER

Dr. Chen is currently the Dean of the Faculty of Science and Technology, University of Macau, Macau, China and a Chair Professor of the Department of Computer and Information Science since 2010. He worked at U.S. for 23 years as a tenured professor, a department head and associate dean in two different universities.

Dr. Chen’s research areas are in systems, cybernetics and computational intelligence. He is a Fellow of the IEEE and AAAS. He was the President of IEEE Systems, Man, and Cybernetics Society (SMCS) (2012-2013). Currently, he is the Editor-in-Chief of IEEE Transactions on Systems, Man, and Cybernetics: Systems (2014-). He has been an Associate Editor of many IEEE Transactions, and currently he is an Associate Editor of IEEE Trans on Fuzzy Systems, IEEE Trans on Cybernetics, IEEE/CAA Automatica Sinica, and several IEEE Transactions. He is also a Fellow of CAA and Fellow of HKIE and an Academician of International Academy of Systems and Cybernetics Science (IASCYS). He was the Chair of TC 9.1 Economic and Business Systems of IFAC and was an ABET (Accreditation Board of Engineering and Technology Education, USA) Program Evaluator for Computer Engineering, Electrical Engineering, and Software Engineering programs.

Dr. Chen received Outstanding Electrical and Computer Engineering Award in 2016 from his alma mater, Purdue University, West Lafayette, where he received his Ph.D. degree in 1988; after he received his M.S. degree in electrical engineering from the University of Michigan, Ann Arbor, in 1985.