

**Title:** Broad Learning: A paradigm shift in discriminative incremental learning

**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 complete paradigm shift in discriminative learning and a very fast and accurate learning without deep structure. The broad learning system (BLS) utilizes the power of incremental learning. That is without stacking the layer-structure, the designed neural networks expand the neural nodes broadly and update the weights of the neural network 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. Several BLS variations that cover existing deep-wide/broad-wide structures and recent results using BLS will be discussed.



**Biography:** Dr. Chen is the former Dean (2010-2017) and a Chair Professor of the Department of Computer and Information Science of University of Macau. His research areas are in systems, cybernetics and computational intelligence. He is a Fellow of the IEEE and AAAS. Dr. Chen 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- ), an Associate Editor of IEEE Trans on Fuzzy Systems, IEEE Trans on Cybernetics, and IEEE/CAA Automatica Sinica. 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. He was an ABET (Accreditation Board of Engineering and Technology Education, USA) Program Evaluator for Computer Engineering, Electrical Engineering, and Software Engineering programs. University of Macau’s Engineering and Computer Science programs receiving HKIE’s accreditation and Washington/Seoul Accord is his utmost contribution in engineering education for Macau. During his deanship, the engineering and computer science programs are ranked at world top 200 in the Times Higher Education (THE) world university ranking in 2017. The computer science program is also ranked at world top 175 in the US News and World Report global university ranking.

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.