■ **报告题目**： Extreme Learning Machine: Towards Tuning-Free Learning Extreme Learning Machine

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摘 要：

Neural networks (NN) and support vector machines (SVM) play key roles in machine learning and data analysis in the past 2-3 decades. However, it is known that these popular learning techniques face some challenging issues such as: intensive human intervene, slow learning speed, poor learning scalability. This talk will introduce a next generation of learning theory; the resultant biologically inspired learning technique referred to as Extreme Learning Machine (ELM) and its wide applications. ELM not only learns up to tens of thousands faster than NN and SVMs, but also provides unified implementation for regression, binary and multi-class applications. ELM not only produces good results for sparse datasets but also is efficient for large size of applications. From both theoretical and practical points of view, NN and SVM/LS-SVM may only produce suboptimal solutions to ELM. Our preliminary study also shows that ELM outperforms Deep Learning in both learning accuracy and learning speed (up to tens of thousands times faster). ELM is efficient in time series, online sequential, incremental applications. More and more researchers are studying ELM and its potential applications in face recognition, EEG signal processing, brain computer interface, medical image processing, bioinformatics, disease prediction/detection, object recognition, knowledge discovery, data privacy, security, image quality assessment, semantic web, hardware implementation, cloud computing, and many other industrial applications.

简 介：

Guang-Bin Huang received the B.Sc degree in applied mathematics and M.Eng degree in computer engineering from Northeastern University, P. R. China, in 1991 and 1994, respectively, and Ph.D degree in electrical engineering from Nanyang Technological University, Singapore in 1999. During undergraduate period, he also concurrently studied in Applied Mathematics department and Wireless Communication department of Northeastern University, P. R. China. He serves as an Associate Editor of Neurocomputing, neural networks, and IEEE Transactions on Systems, Man and Cybernetics - Part B. He is a senior member of IEEE. His SCI is 2300+ and HCI is 23.

His current research interests include big data analytics, human computer interface, brain computer interface, image processing/understanding, machine learning theories and algorithms, extreme learning machine, and pattern recognition. From May 2001, he has been working as an Assistant Professor and Associate Professor (with tenure) in the School of Electrical and Electronic Engineering, Nanyang Technological University. He is program leader of BMW-NTU Joint Future Mobility Lab on Human Machine Interface and Assisted Driving. He has led/implemented several key industrial projects (e.g., Chief architect/designer and technical leader of Singapore Changi Airport Cargo Terminal Upgrading Project, etc). He is the consultant (Computational Intelligence) of Computational Clinical EEG Monitoring Center of Massachusetts General Hospital / Harvard Medical School, USA.

One of his main works is to propose a new machine learning theory and learning techniques called Extreme Learning Machines (ELM). ELM not only learns up to tens of thousands faster than NN and SVMs, but also provides unified implementation for regression, binary and multi-class applications. ELM not only produces good results for sparse datasets but also is efficient for large size of applications. From both theoretical and practical points of view, NN and SVM/LS-SVM may only produce suboptimal solutions to ELM. More and more researchers are studying ELM and its potential applications in face recognition, EEG signal processing, brain computer interface, medical image processing, bioinformatics, disease prediction/detection, object recognition, knowledge discovery, data privacy, security, image quality assessment, semantic web, hardware implementation, cloud computing, and many other industrial applications.

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