Organizer: Nanyang Technological University, Singapore
Co-Organizers: University of Oxford, UK; Tsinghua University, China

Call for Papers 3rd

Extreme Learning Machines (ELM) aim to break the barriers between the conventional artificial learning techniques and biological learning mechanism. ELM represents a suite of (machine or possibly biological) learning techniques in which hidden neurons need not be tuned. ELM theories show that effective learning algorithms can be derived based on randomly generated hidden neurons (with almost any nonlinear piecewise activation functions), independent of training data and application environments. Increasingly, evidence from neuroscience suggests that similar principles apply in biological learning systems. ELM theories and algorithms argue that "random hidden neurons" capture an essential aspect of biological learning mechanisms as well as the intuitive sense that the efficiency of biological learning need not rely on computing power of neurons. ELM theories thus hint at possible reasons why the brain is more intelligent and effective than current computers. ELM offers significant advantages over conventional neural network learning algorithms such as fast learning speed, ease of implementation, and minimal need for human intervention. ELM also shows potential as a viable alternative technique for large-scale learning and artificial intelligence.

The main theme of ELM2016 is: **Big Data, Hierarchical Machine Learning and Biological Learning**

Organized by Nanyang Technological University, Singapore, and co-organized by University of Oxford, UK, and Tsinghua University, China, ELM2016 will be held in the beautiful island-country of Singapore. This conference will provide a forum for academics, researchers and engineers to share and exchange R&D experience on both theoretical studies and practical applications of the ELM technique and biological learning.

Accepted papers presented in this conference will be published in conference proceedings and selected papers will be recommended to reputable ISI indexed international journals: *Neurocomputing*, *Neural Computing and Applications*, *Cognitive Computation*, *International Journal of Machine Learning and Cybernetics*, and *Memetic Computing*.

Topics of interest:
All the submissions must be related to ELM technique. Topics of interest include but are not limited to:

Theories
- Universal approximation, classification and convergence
- Robustness and stability analysis
- Biological learning mechanism and neuroscience
- Machine learning science and data science

Algorithms
- Real-time learning, reasoning and cognition
- Sequential/incremental learning and kernel learning
- Clustering and feature extraction/selection/learning
- Random projection, dimensionality reduction, and matrix factorization
- Closed form and non-closed form solutions
- Hierarchical solutions, and combination of deep learning and ELM
- No-Prop, Random Kitchen Sink, FastFood, QuickNet, RVFL, Echo State Networks
- Parallel and distributed computing / cloud computing

Applications
- Time series prediction, smart grid and control engineering
- Pattern recognition
- Social media and video applications
- Biometrics and bioinformatics
- Security and compression
- Human computer interface and brain computer interface
- Cognitive science/computation
- Sentic computing, natural language processing and speech processing
- Big data analytics

Paper submission:
Only full-length manuscripts with good journal of quality will be considered by this conference. Details on manuscript submission can be found in http://elm2016.extreme-learning-machines.org.

Important dates:

Paper submission deadline:	July 1, 2016
Notification of acceptance:	August 1, 2016
Registration deadline:	September 1, 2016