The 9th International Conference on Extreme Learning Machines (ELM2018)
Marina Bay Sands, Singapore
November 21 - 23, 2018

Organizer: Nanyang Technological University, Singapore
Co-Organizers: Tsinghua University, China; Shanghai Jiaotong University, China
University of New South Wales, Australia; City University of Hong Kong

Call for Papers 3rd

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Extreme Learning Machines (ELM) aims to enable pervasive learning and pervasive intelligence. As advocated by ELM theories, it is exciting to see the convergence of machine learning and biological learning from the long-term point of view. ELM may be one of the fundamental `learning particles' filling the gaps between machine learning and biological learning (of which activation functions are even unknown). ELM represents a suite of (machine and biological) learning techniques in which hidden neurons need not be tuned: inherited from their ancestors or randomly generated. ELM learning theories show that effective learning algorithms can be derived based on randomly generated hidden neurons (biological neurons, artificial neurons, wavelets, Fourier series, etc) as long as they are nonlinear piecewise continuous, 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.

The main theme of ELM2018 is: **Hierarchical ELM, AI for IoT, Synergy of Machine Learning and Biological Learning**

Organized by Nanyang Technological University, Singapore, and co-organized by Tsinghua University, Shanghai Jiaotong University, China, University of New South Wales, Australia and City University of Hong Kong, ELM2018 will be held in 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.

Tutorial proposals:
All interesting topics on general artificial intelligence and machine learning techniques are welcome, which include but not limited to: deep learning, reinforcement learning, sparse coding, extreme learning machines, etc.

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

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
- Parallel and distributed computing / cloud computing

Applications
- AI in IoT (Internet of Things)
- Financial data analysis
- Smart grid and renewable energy systems
- 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

Hardware
- Lower power, low latency hardware / chips
- Artificial biological alike neurons / synapses

Paper submission:
Manuscripts can be submitted via http://elm2018.extreme-learning-machines.org.

Important dates:

Paper submission deadline:	~~July 1, 2018~~	July 31, 2018
Notification of acceptance:	~~August 1, 2018~~	August 15, 2018
Registration deadline:	~~September 1, 2018~~	September 30, 2018