2016 IEEE World Congress on Computational Intelligence
July 25-29, 2016 - Vancouver, Canada

International Workshop on

Neuromorphic Computing and Cyborg Intelligence

News:

High quality workshop papers will be invited to submit their full studies to an upcoming special issue on IEEE Transactions on Cognitive and Developmental Systems!

Overview

Emulating brain-like learning performance has been a key challenge for research in neural networks and learning systems, including recognition, memory and perception. In the last few decades, a wealth of machine learning approaches have been proposed including sparse representations, hierarchical and deep learning neural networks. While achieving impressive performance these methods still compare poorly to biological systems and the problem of reducing the amount of human supervision and computations needed for learning remains a challenge.

On the other hand, the development of novel data representation and learning approaches from recent advances in neuromorphic systems have shown appealing computational advantages. For example, using neural coding theory to represent the external sensory data, and developing spiking timing based learning algorithm have achieved real-time learning performance, either in neuromorphic computational models or hardware systems. Attributed to the new visual or auditory sensors, neuromorphic hardware has provided a fundamentally different technique for data representation, i.e., asynchronous events rather than frames of images as in main stream recognition algorithms. However, the current neuromorphic information processing algorithms are not comparable to achieve sophisticated features and power learning performance as what machine learning approaches can offer. One promising method is to develop integrated learning models that apply brain-like data presentation and learning mechanisms, e.g., implementing deep learning in neuromorphic systems. Neuromorphic systems also overlap with another framework called cyborg intelligence, combining brain functions with computational machines to achieve the best of both via brain-machine interface. The workshop will target the challenging problems in these areas by reporting new solutions, theoretical and technical advances in neuromorphic computing and cyborg intelligence from the worldwide researchers and engineers.

Relevant Topics

- Cognitive computing and cyborg intelligence
- Neuromorphic information/signal processing
- Brain-inspired data representation models
- Neuromorphic learning and cognitive systems
- Spike-based sensing and learning
- Neuromorphic sensors and hardware systems
- Intelligence for embedded systems
- Cognition mechanisms for big data
- Embodied cognition and neuro-robotics.

Important Dates:
- Submission deadline: 15 January 2016
- Notification of acceptance: 15 March 2016
- Camera-ready deadline: 15 April 2016
- Workshop date: 25 July 2016

Submission Guidelines

Prospective authors are invited to submit papers according to the IEEE format. All submissions should follow the specifications of WCCI 2016. Manuscripts will be submitted through the IEEE WCCI 2016 paper submission website and will be subject to the same peer-review procedure as the WCCI2016 regular papers. Accepted contributions will be part of the IJCNN conference proceedings, which will be available in IEEE Xplore.

Organizers:
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