CALL FOR PAPERS

IEEE Transactions on Emerging Topics in Computational Intelligence

Special Issue on Large-Scale Memristive Systems and Neurochips for Computational Intelligence

I. AIM AND SCOPE

A special issue of the IEEE Transactions on Emerging Topics in Computational Intelligence will be dedicated to Large-Scale Memristive Systems and Neurochips for Computational intelligence. Original, unpublished research and application contributions matching the main theme of this special issue are welcome. Comprehensive tutorial and survey papers on Memristive Systems and Neurochips are considered for this special issue as well.

In the recent years, there has been a dramatic increase in the volume of research done to explore the application of memristors in various smart sensors, chips and systems, such as for implementing neural networks, deep learning, hierarchical temporal memories, intelligent memory arrays and brain-inspired neuromorphic systems. The small size, ease of programmability, low leakage currents, ability to maintain resistance states and CMOS compatibility make the memristor a useful device for neurochip implementations. The possibility of using memristors to mimic neural circuits as well as to implement learning memory for various spatio-temporal pattern recognition and neuromorphic computing applications makes it further a versatile device. However, in this early stages of development and exploration, the practical realisation of computational intelligence applications requires the development of in-depth theory, modelling, simulation and implementation of the memristors in large scale arrays and networks. This special issue aims to identify state of the art in the memristive systems and neurochips, and specifically encourages submissions that support the theory, algorithms and implementation of a wide range of emerging computational intelligence applications such as artificial life, artificial cellular networks, bio-inspired networks, and intelligence over the internet of things.

II. THEMES

We seek original papers with novel research contributions in all aspects of theory, simulations, algorithms, and implementation of complex memristive systems and neurochips, with a strong emphasis on emerging cross-disciplinary applications of computational intelligence. Topics of interest for this issue include, but are not limited to:

- Novel techniques for simulation and emulation of memristive systems and neurochips
- Bioinspired circuits, algorithms and systems utilizing memristive arrays
- Intelligent sensory signal processing algorithms for neuro-memristive systems
- Large-scale memristive systems and neurochips for internet of things
- Neuromorphic models, algorithms and systems, and its computational intelligence applications
- Intelligent memory systems, cognitive architectures and its implementations
- Large-scale implementations and simulations of neurochips
- Spatio-temporal analysis with neurochips and memory systems
- Deep learning architectures, theories, systems and its implementations
- Neurochip systems of systems implementation, and architecture optimisations

III. IMPORTANT DATES

Submission deadline: October 30, 2017
Author notification: January 15, 2017
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Final version: April 15, 2018

IV. GUEST EDITORS

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