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Call for Papers

IET Cyber-Physical Systems: Theory & Applications

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Special Issue:

Brain-inspired Computing for Cyber-Physical Systems

Cyber-Physical Systems (CPS) are characterized by deep complex intertwining between cyberspace and the physical world. The basic notion of CPS is to use computing (sensing, data analytics, predicting, understanding, etc.), communication (interaction, intervention, interface management, etc.) and control (automation, validation, interoperability, etc.) to make intelligent and autonomous systems for applications in healthcare, manufacturing, defense, transportation, and many others. The target characteristics of CPS, such as autonomy, low cost, fault tolerance, and availability, call for a radical shift in the computing paradigm. One of the most promising paradigms is based on the computational principles of the human brain (brain-inspired computing). Brain-inspired computing is fundamentally different to contemporary methodologies, which are based on the brittle “compute-and-store” concept. The strengths of brain-inspired computing – like the human brain it attempts to emulate – lie in the close coupling of computation and memory, its ability to handle imprecise and incomplete data, inherent fault tolerance, and the ability to learn. Equipped with these properties, CPS could compute at much lower power and make more reliable real-time decisions than current implementations. However, there are many issues and hurdles that need to be addressed to realize the full potential of brain-inspired computing for future CPS.

The goal of this special issue is to provide a platform for researchers and practitioners from academia, government and industry to present their research results in the area of brain-inspired computing and CPS. Submissions should present novel algorithms, tools, architectures, protocols, theories, design, and technologies for brain inspired computing and CPS.

Topics include, but are not limited to:

- Neuromorphic computing for cyber-physical systems
- Machine learning, supervised/unsupervised/semi-supervised learning for cyber-physical systems
- Deep learning, deep reinforcement learning for cyber-physical systems
- Cross layer modeling and optimization in cyber-physical systems
- Simulation, testing and formal verification
- Device, circuit, architecture design, analysis and optimization for neuromorphic computing systems
- Complexity and scalability
- Applications of brain-inspired cyber-physical systems
- Reliability and security of cyber-physical systems
- Emerging technologies for brain-inspired cyber-physical system implementation

All submissions are subject to the journal's peer-review procedures. The authors should follow the journal's Author Guide at <http://digital-library.theiet.org/journals/author-guide> when preparing papers for submission to the Special Issue.

Important dates:

Submission deadline:
1 May 2017

Publication Date:
Q1 2018

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