Call for Papers

Special Issue on "Cyber-Physical Cloud Systems"

IEEE Transactions on Systems, Man, and Cybernetics: Systems

Cyber-physical clouds refer to the cyber-physical systems and Internet of Things that are underpinned and enabled by cloud computing and services. Most profoundly, a cyber-physical cloud system is a cloud computing system that is driven by a physical dynamic process, distinguishing itself from a cloud datacenter. Cyber-physical clouds are emerging as the next paradigm for distributed (often Internet connected) cyber-physical systems. From a systems engineering point of view, cyber-physical clouds rely upon a unified framework of cloud services to constitute a revolutionary way for building spontaneous systems of communicating smart devices, sensors and actuators and handling the big data challenges of distributed cyber-physical systems. By embedding new ambient intelligence and especially cloud service provisioning amidst interconnected objects, devices and machines, cyber-physical clouds will leverage new breeds of cyber-physical systems and applications which are impromptu dynamically composed of massive, discoverable and interoperable services in a smart digital world.

Cyber-physical cloud systems are characterized by very distinctive natures in four perspectives, that is,

- Scale. A cyber-physical cloud system is of massive scale in terms of smart devices, which intelligently provide and at the same time consume automated services;
- Data. A cyber-physical cloud system suffers from genuine big data challenges as massive smart devices generate continuous, real-time data flows. For example, how to assure overall level dependable functionalities and services on massive devices that individually may not all be reliable or break down locally or may leave the system. This requires deep intelligence analytics, including data mining and machine learning algorithms, to make sense of data, to diagnose and localize faults and anomalies in the system, and to detect malicious cyber intrusions and attacks;
- Service. Massive services are provisioned in a cyber-physical cloud system. This causes challenges such as service interoperability and integration, for example, how to carry out discovery, brokerage and delivery of real-time sophisticated services;
- Vulnerability. A cyber-physical cloud system suffers from boundaryless security threats and risks, that is, how to assure security and privacy in a totally open, distributed and dynamic environment. While total internet connectivity is a prerequisite of cloud services and functionalities, this exposes the systems and users to a boundaryless and defenseless environment.

The above distinctive natures manifest the significant challenges of cyber-physical cloud systems. This special issue aims to provide a timely forum for the advances and trends in cyber-physical clouds, in both engineering methodologies and industry application impacts, and at the same time, to stimulate a fundamental re-thinking into the future of cyber-physical cloud systems.

Indicative Topics/Areas

Below are just indicative topics/areas that would be of interest, but is not supposed to be an exhaustive list.

- Cloud computing and services for cyber-physical systems,
- Cloud computing and services for Internet of Things,
- Cloud computing and services for industrial automation and Industry 4.0,
- Cloud computing and services for smart grid,
- Service provisioning in cyber-physical clouds,
- Big data analytics in cyber-physical clouds
- Security in cyber-physical clouds.

Manuscript and Submission

Preparation of manuscripts should refer to the guidelines in the "Information for Authors" on the IEEE Transaction on System, Man Cybernetics: System website: http://www.ieeesmc.org/publications/transactions-on-smc-systems/information-for-authors

Submission for the special issue goes through the normal process. Special Issue's papers are designated in the submission process as "Regular Paper - Special Issue" and "Correspondence - Special Issue".

Manuscripts for the special issue should be submitted through the Manuscript Central web site: http://mc.manuscriptcentral.com/systems In the Cover Letter to Editor-in-Chief Section, authors should explicitly include the following statement: This manuscript is submitted for the Special Issue on "Cyber-Physical Cloud Systems (Guest Editor: H Tianfield)."

Further questions about the special issue may be directed the Guest Editor on contact provided below.

Schedule

Submission of manuscripts	December 15, 2015
Submissions close	March 15, 2016
Initial notification after 1st round peer reviews	July 15, 2016
Further notification after author revisions and 2nd round reviews	October 15, 2016
Final files for publishing	January, 2017

Guest Editor

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