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Computational Intelligence for IoT, Cloud, Edge, and Fog Systems

Aim and Scope

The advancements in the use of Internet of Things (IoT) is increasing continuously and generating huge amounts of data in a fast manner. However, IoT have to face many issues and challenges in their communications and resources. Cloud computing is an important paradigm which processes and manages user data effectively. Further, fog and edge computing paradigms are introduced to improve user service by reducing latency and response time. The cooperation among cloud, edge, and fog computing as well as IoT is believed to fully unlock the potential of IoT in provisioning ubiquitous, seamless, high-speed and reliable IoT device-to-client communication, unlimited data processing and storage capacity, low-latency IoT service delivery, etc.

In cloud, edge and fog systems, several metrics are related to the quality of service (QoS). In order to improve these metrics, many optimization problems have been formulated for tackling these issues. However, compared with optimization problems in other areas, these optimization problems are normally highly complex and NP-hard, which may include mixed/strongly-coupled variables, nonlinear constraints, multiple objectives, and bilevel structures. Therefore, they may not be solved by the traditional convex optimization-based methods. In addition, their optimal solutions should be found within a reasonable amount of time.

As a class of nature-inspired computational approaches, computational intelligence exhibits great potential in addressing complex optimization problems, which has attracted much attention from both academia and industry.

This special session seeks to bring together research that sheds light on the ways in which computational intelligence, IoT and cloud, edge and fog computing will mutually shape the future of the next generation of information technology. Topics of interest include, but are not limited to:

- Computational intelligence for the cooperation among IoT, cloud, and edge/fog
- Computational intelligence for IoT/cloud/edge/fog resource scheduling
- Computational intelligence for IoT/cloud/edge/fog service deployment, selection and orchestration
- Computational intelligence for IoT/cloud/edge/fog service QoS forecasting and monitoring
- Computational intelligence for edge/fog node placement, data caching, and task offloading
- Computational intelligence in edge clouds
- Computational intelligence in Cyber Physical Systems
- AI enabled IoT and Social IoT
- Machine learning enabled edge intelligence
- Federated learning for IoT or edge devices
- Intelligent security/trust/privacy mechanism for IoT and edge/fog networks
- Privacy-aware and energy-aware machine learning
- Real-world use cases of computational intelligence combined with IoT/cloud/edge/fog

Special Session Organisers

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Important Dates

Paper Submission: January 31, 2022

Notification of Acceptance: April 26, 2022

Final Paper Submission: May 23, 2022

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Instructions

To submit a paper to the special session, please go to the WCCI-2022 paper submission page.

All instructions, which you need to follow to prepare your manuscript, are given here.