Association for Computing Machiner

Important Dates

Manuscript Submission:
March 31, 2021

First Notification:
June 30, 2021

Submission of Revised Manuscript:
August 15, 2021

Final Notification:
October 15, 2021

Final Paper Due:
November 15, 2021

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Over the past two decades, the Internet of Things (IoT) has evolved from silos built around custom protocol stacks into a system of systems built around standards—and the recent standardization of the Web of Things (WoT) at the IETF and the W3C further facilitates application-layer interoperability in the IoT. Constrained Web servers now target devices with as little as 10 KiB of RAM and 100 KiB of ROM, which means sensors and actuators can be abstracted behind embedded Web services. Going further, the WoT aims to provide uniform access to IoT devices through the Web—by hiding the protocols and interfaces used to access the devices behind abstract interaction patterns and hypermedia controls. From the edge of the network to the cloud, the Web is now emerging as a uniform hypermedia fabric that interconnects IoT devices and digital services.

Still, many research questions remain open. IoT systems are not only inherently complex and heterogeneous, but also highly dynamic as the availability of devices (and their services) changes continually. Moreover, the IoT is inherently decentralized because it is not under the control of a single entity. In such settings, traditional engineering paradigms become impractical. Researchers and practitioners in the IoT community therefore require means to build sophisticated software agents that can achieve their design objectives through flexible interaction with other entities in their system. Many of the underlying research questions the IoT community is now confronted with—such as how to balance goal-directed and reactive behavior in software agents, or how to design and govern interactions in a decentralized IoT—have been investigated in the scientific literature on multiagent systems. At the same time, the IoT unlocks new practical use cases for multiagent systems.

This special issue invites novel research contributions on multiagent systems and services in the IoT/WoT. Topics of interest include, but are not limited to:
- Architectures for decentralized IoT systems
- Multiagent systems and digital twins
- Multiagent systems for constrained IoT environments
- Self-organization and swarm intelligence in IoT systems
- Reinforcement learning agents in IoT environments
- Distributed multiagent optimization in the IoT
- Multiagent decision support in the IoT
- Governance, security, and trust in decentralized IoT systems
- WoT, hypermedia services, and constrained RESTful environments
- Web-based discovery, search, and composition of IoT services
- Semantic interoperability and data integration in the IoT
- Big data-driven IoT systems
- Mobile data mining and management in the IoT
- Decentralized data management and querying in the IoT
- Information processing in cloud-fog-edge computing
- Emerging technologies and applications

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Paper submission will be through Manuscript Central. It will open one month before the paper submission deadline. Please select "Special Issue on Multiagent Systems and Services in the Internet of Things" when submitting.