# CALL FOR PAPERS

## *IEEE Transactions on Emerging Topics in Computational Intelligence*

## Special Issue on Computational Intelligence for IoT-based Human Activity Recognition

### I. AIM AND SCOPE

Human activity recognition (HAR) can benefit a number of applications. For instance, it can be adopted in a healthcare service system to monitor the rehabilitation processes of patients. Long-term monitoring of human activities can help doctors to evaluate the health states of elderlies. Another important application of HAR is in security and surveillance which requires to analyze human behaviors in specific areas. In human computer interface, recognizing human activities can be used to control robots and play virtual reality games.

Many Internet of Things (IoT) sensors have been utilized for human activity recognition, such as wearable sensors, smartphones, radio frequency (RF) sensors (WiFi, RFID), LED light sensors, cameras, etc. Owing to the rapid development of wireless sensor network in IoT, a large amount of data has been collected for the recognition of human activities with different kind of sensors. Conventional computational intelligence algorithms, such as shallow neural networks, require to manually extract some representative features from large and noisy sensory data, which may hinder their performance. Alternatively, the more advanced computational intelligence algorithms of deep neural networks have achieved great success in many challenging research areas, such as image recognition and natural language processing. The key merit of the deep neural networks is the ability to automatically learn representative features from massive amount of data.

Recently, some emerging topics on HAR attract great attentions. For instance, the security concern about personal data during activity recognition is curial. Hence, security preserved HAR (e.g., via federated learning) systems can be an important research direction. Moreover, the emerging topics of adversarial learning, zero-shot learning and meta-learning (learn from related tasks) can also play key roles for the issues of data inefficiency in the task of HAR. To further improve the performance of activity recognition, incorporating prior knowledge or context via knowledge graph is another research direction that worth exploring. Some general challenges on device heterogeneity, environment changes, model transfer, real-time prediction, data imbalance etc. will also be covered.

This special collection intends to prompt emerging techniques on computational intelligence for IoT-based human activity recognition. All submitted papers will be peer-reviewed and selected based on both their quality and relevance.

### II. TOPICS

The topics of interest for this special issue include, but are not limited to

- IoT Sensor based HAR using Computational Intelligence
- Security preserved HAR
- Reinforcement learning for HAR
- Adversarial learning for HAR
- Knowledge graph for HAR
- Zero-shot learning for HAR
- Meta-learning for HAR
- Federated learning for HAR
- Sensor fusion for HAR
- Device heterogeneity for device-based HAR
- Environment changes for device-free HAR
- Transfer Learning for HAR
- Online Learning for HAR
- Active Learning for HAR
- Ensemble Learning for HAR
- Semi-supervised Learning for HAR

### III. SUBMISSIONS

Manuscripts should be prepared according to the "Information for Authors" section of the journal, and submissions should be done through the journal submission website: https://mc.manuscriptcentral.com/tetci-ieee, by selecting the Manuscript Type of "Computational Intelligence for IoT-based Human Activity Recognition" and clearly marking "Computational Intelligence for IoT-based Human Activity Recognition" as comments to the Editor-in-Chief. Submitted papers will be reviewed by at least three different reviewers. Submission of a manuscript implies that it is the authors' original unpublished work and is not being submitted for possible publication elsewhere.

### IV. IMPORTANT DATES Paper

Submission deadline: **January 31, 2020**
Notice of the first round review results: **January 31, 2021**
Revision due: **April 30, 2021**
Final notice of acceptance/reject: **June 30, 2021**

### V. GUEST EDITORS

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