

# Call For Papers

## IEEE JSAC Special Issue on “Human-In-The-Loop Mobile Networks”

Due to rapid developments of smart devices and mobile applications, human activities, usage behavior and perceived experience of users weigh increasingly on the performance of mobile networks. Scenarios include mobile communication networks, haptic communications for 5G, device-to-device (D2D) networks, and wearable sensor networks. In these systems, human users interact extensively with the system, and the user-perceived quality-of-experience (QoE) is critical. However, various important human factors, e.g., predictable and repeating behavior, have not yet been well understood and fully taken into consideration in current generation mobile networks. Hence, a paradigm shift is required for designing a new human-in-the-loop architecture for mobile networks, by actively learning, predicting, adapting, and steering user behavior, so as to greatly improve system efficiency and to provide superior users QoE. Specifically, such an architecture includes the following main components.

**Human behavioral big data:** Large-scale data is the foundation of user behavior study and prediction. However, their formats must be carefully designed to reflect user features in multi-dimensions, the crowd needs to be incentivized for data sensing and acquisition, and one may also need to leverage distributed caching, computing and communication capabilities of smart devices for scalable and reliable data communications.

**Human behavior learning and analytics:** Human behavior exhibits significant amount of predictability, and tends to have repeated patterns, e.g., mobility and usage patterns. Efficient techniques must be developed or tailored towards human behavior modeling and data processing, and must be able to handle the dynamic nature of acquired data and respect heterogeneous constraints in data sampling and processing.

**Intelligent control for human-intense mobile networks:** Online learning-based control and predictive control techniques must be developed to enable seamless integration of data in system optimization. They should be able to exploit benefits of behavior learning, while handling the selfish nature of human users and randomness in human actions, with the ultimate objective of guaranteeing superior QoE in resource-limited mobile networks.

In this special issue, we focus on fundamental problems involving human activities and interactions with future mobile networks. We invite submissions of high-quality original technical papers, which have not been published previously. The topics in this call include but are not limited to the following areas:

- Crowdsensing and analytics of human user data
- Human-system interaction modeling and analysis for mobile networks
- Predictive control in multi-user mobile communication systems
- Online behavior-learning and control in mobile networks
- Local caching in human-intense mobile systems
- Human-intense D2D communications
- Resource allocation and optimization for 5G haptic communications

### Submission Guideline

Authors please refer to submission rules specified in the “Information for Authors” section of the JSAC guidelines (<http://www.comsoc.org/jsac/author-information>) when preparing their papers (submissions not satisfying the requirements will be rejected immediately without review). Papers should be submitted through EDAS (<http://www.edas.info>) according to the following schedule:

- Submission Deadline: **September 1, 2016**
- Acceptance Notification: December 1, 2016
- Final Material to IEEE: January 1, 2017
- Publication Date: First Quarter 2017

### Guest Editors

- Longbo Huang (Lead) - Tsinghua University, [longbohuang@tsinghua.edu.cn](mailto:longbohuang@tsinghua.edu.cn)
- Lingjie Duan - Singapore University of Technology and Design, [lingjie\\_duan@sutd.edu.sg](mailto:lingjie_duan@sutd.edu.sg)
- Cedric Langbort - University of Illinois Urbana-Champaign, [langbort@illinois.edu](mailto:langbort@illinois.edu)
- Alexey Pozdnukhov - University of California, Berkeley, [alexep@berkeley.edu](mailto:alexep@berkeley.edu)
- Jean Walrand - University of California, Berkeley, [walrand@berkeley.edu](mailto:walrand@berkeley.edu)
- Lin Zhang - Tsinghua University, [linzhang@tsinghua.edu.cn](mailto:linzhang@tsinghua.edu.cn)