Hindawi
Wireless Communications and Mobile Computing
Volume 2018, Article ID 6231236, 2 pages
https://doi.org/10.1155/2018/6231236

Editorial

Crowdsourcing for Mobile Networks and IoT

Xiping Hu[1], **Zhaolong Ning**[2], **Kuan Zhang**[3], **Edith Ngai**[4], **Kun Bai**[5] and **Fei Wang**[6]

[1]*Chinese Academy of Sciences, Shenzhen, China*
[2]*Dalian University of Technology, Dalian, China*
[3]*University of Waterloo, Waterloo, ON, Canada*
[4]*Uppsala University, Uppsala, Sweden*
[5]*Tencent Company, Shenzhen, China*
[6]*Cornell University, Ithaca, NY, USA*

Correspondence should be addressed to Xiping Hu; xp.hu@siat.ac.cn

Received 5 February 2018; Accepted 6 February 2018; Published 5 June 2018

As the deep integration of ubiquitous sensors, intelligent devices, and social networks, mobile networks and IoT are formed by the opportunity of virtual mobile communication networks and social communities between mobile carriers. People involved in a mobile network can easily interact and share information with each other anytime and anywhere through the popular use of intelligent devices. As a result, there is a remarkable trend to enable crowdsourcing for mobile networks and IoT to address various problems that involve real-time collection, processing, and collaborations among participants in highly mobile environments. Thus, crowdsourcing could be an efficient strategy to improve quality and user experiences of applications in mobile networks and IoT, which not only potentially brings enormous benefits for economics but also leads to revolution for our daily life. The embedded sensors including accelerometer, compass, gyroscope, GPS, microphone, and camera in mobile phones are leveraged to gather the required information to support location-based services, for example, environmental measurements, personal activity sharing, and online recommendation. In this special issue on crowdsourcing for mobile networks and IoT, we have invited some papers that address such issues.

L. Nie et al. introduce a network traffic prediction method in wireless mesh backbone networks based on deep learning and spatiotemporal compressive architecture. This method applies discrete wavelet transform to extract the low-pass component of network traffic. The performance of this method is verified by comparing with three widely used traffic prediction methods.

The paper entitled "CPSFS: A Credible Personalized Spam Filtering Scheme by Crowdsourcing" proposes a credible personalized spam filtering scheme and classifies spam into two categories, that is, complete-spam and semispam, before filtering them. According to the social trust and interest similarity, complete-spam can be filtered by the Bayesian filtering, and semispam can be estimated by crowdsourcing at the client side.

In order to maximize network utility, H. Meng et al. demonstrate an optimal real-time pricing strategy for computing resource management in mobile crowdsourcing. Furthermore, the existence of real-time prices is proved, which can align individual optimality with systematic optimality.

H. Zhu et al. allocate the sharing resource to users across the network edge. A novel architecture is proposed to share resource of physical customer-premised equipment nodes across the network edge and assign virtual customer-premised equipment instances to a cost-efficient node.

The paper entitled "An SAT-Based Method to Multithreaded Program Verification for Mobile Crowdsourcing Networks" presents a novel IC3-based algorithm on the safety verification of the multithreaded programs for mobile crowdsourcing networks. The performance of the proposed algorithm is evaluated by the SAT-based model checking algorithms, focusing on memory consumption.

Y. Ye et al. introduce a color distribution pattern metric method, concentrating on reidentification in video searching for surveillance and forensic fields in crowdsourcing IoTs. Performance evaluations show that the presented method on different datasets can obtain higher network accuracy.

L. Guo et al. present a WiFi-based public activity framework by combining channel state information and crowdsourced skeleton joints to improve the robustness and accuracy of activity recognition. The experiments show that the proposed method achieves high recognition accuracy in different datasets.

J. Lei et al. introduce a channel assignment algorithm based on point coordination function for cochannel deployment of access point in WLANs. Furthermore, the experiments are carried on networks with different densities. The results show the presented method can obtain high throughput, low packet loss rate, and bounded access delay compared with the existing methods.

The work from Y. Ma et al. focuses on the channel access and power control problem in device-to-device underlaid cellular networks. A novel semidistributed network-assisted power and channel access control scheme for D2D user equipment is proposed, and the achieved performances by cellular and D2D links are both evaluated.

The paper entitled "A Crowdsensing-Based Real-Time System for Finger Interactions in Intelligent Transport System" demonstrates a real-time projector-camera finger system based on crowdsensing, in which users can interact with a computer by bare hand touching on arbitrary surface. This designed system can be applied as an intelligent device in transport systems.

M. Qiao et al. introduce a channel selection strategy with hybrid architectures, combining the centralized and the distributed methods, which can reduce the overhead of access point and provide more flexibility in network deployment. Based on the self-decision algorithm and offline self-learning algorithm, the presented strategy is investigated in multichannel wireless sensor networks. The theoretical analysis and performance evaluation depict the effectiveness of the studied algorithm.

The paper entitled "A Time and Location Correlation Incentive Scheme for Deep Data Gathering in Crowdsourcing Networks" addresses the problem of optimizing the quality of senor data and collection enough sensor data in sensor data gathering system. Based on the greedy strategy, two effective algorithms are proposed for motivating smartphone users to participate in the smartphone-based crowdsourcing sensing.

Q. Wu et al. study a low precision and weak timeliness required smoke system. The implementation of intelligent smoke alarm system, containing sensor network, classification algorithm, and visual interface, is presented to monitor the fire in the weak electromagnetic environment.

The paper written by X. Li et al. proposes a supervised descent method. It leverages the performance of face feature points detection on mobile terminals and proves the optimization of the presented algorithm.

D. Shen et al. concentrate on the traffic scheduling and load balancing problem in software-defined mobile wireless networks and present a crowdsourcing-based routing forwarding scheme as well as a congestion control algorithm to solve the formulated problem.

Xiping Hu
Zhaolong Ning
Kuan Zhang
Edith Ngai
Kun Bai
Fei Wang