Association for Computing Machinery

ACM Transactions on Internet Technology– Special Issue on

Human-Enabled Edge Computing for Smart Cities

Special Issue Guest Editors

Dr. Vicente Garcia Diaz
Associate Professor,
University of Oviedo, Spain.
garciavicente@ieee.org

Dr. Jerry Chun-Wei Lin
Professor, FIET,
Western Norway University of Applied Sciences, Norway.
jerrylin@ieee.org

Dr. Juan Antonio Morente Molinera
Associate Professor,
PDI, University of Granada.
jamoren@decsai.ugr.es

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ACM TOIT Editor-in-Chief

Prof. Ling Liu
School of Computer Science,
Georgia Institute of Technology
ling.liu@cc.gatech.edu

Submission Instructions

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Most countries across the globe are striving to conceptualize smart cities by providing core infrastructure for harnessing technology. Here, Edge Computing (EC) plays a vital role in faster data processing and timely response in the network edges. In recent times, smart cities adopt EC to enhance building security, home automation, city parking system, traffic management, and city management. As opposed to traditional IoT networks which collect and send data to a central cloud for further processing, EC supports on-device data computing and analytics, which also minimizes the network load. For instance, driverless cars are essential for smart cities that perform processing at its edge without sending data to the central cloud. A successful smart city environment in a densely populated area requires various crowdsensing services, which are provided by Mobile crowdsensing (MCS) and Mobile edge computing (MEC) techniques. These techniques provide specific service to some specific geographical location during a particular duration; however, they facilitate more technical communication services with static edges, rather than the human aspect. This leads to the dynamic extension of MEC: Human-enabled Edge Computing (HEC), which integrates elements of humans, devices, internet, and information along with the MEC architecture and sensing ability of MCS.

HEC utilizes dynamic allocation of smart devices such as smartphones and wearables of people roaming through the cities for better context awareness compared to a traditional sensor network. Besides, data generated from mobile devices is used for crowd intelligence extraction and human-centered service delivery. Due to the participation of humans and things, edge computing needs intelligence methods like machine learning, data mining, and cognitive intelligence for classification and decision making. The smart city employs edge intelligence in data collected from different sectors of the smart city by running analytics algorithms at the edge. This decreases the latency in decision making for connected devices and enhances the quality of the data. Many sectors of smart cities are using HEC along with the advantages of next-generation wireless technology connectivity, which connects things to people and to IoT, thereby leading to high-performance services and automation for creating dense and dynamic data sets. A successful edge computing infrastructure requires a combination of a local server, artificial intelligence, and connectivity to mobile, automotive, and IoT computing systems.

This special issue aims to bring out the most innovative and novel planning measures for Human-enabled Edge computing for smart city development and management processes.

Topics of interest to this special issue include, but are not limited to:

- Deep learning and data mining for leveraging HEC
- Artificial intelligence for autonomous management of HEC
- Smart city-based application and case studies of HEC
- Studies on cognitive inspired HEC for smart cities
- Need for crowd intelligence in smart cities
- Human factors to be considered for edge computing in smart city
- Novel techniques and future perspective in HEC
- Smart city: Security and privacy challenges of crowdsensing in HEC
- New models, architectures and frameworks of HEC
- Smart devices and wearable technologies used for crowdsensing in smart cities
- Emerging AI techniques and their combination with MEC in HEC
- Energy-efficient and low-latency communication and computation in HEC