

Call for papers for special section on
“Fog/Edge Computing for Autonomous and Connected Cars”

Overview

Autonomous and connected cars have the potential to provide a safer and greener transportation system for the public. With advances in wireless communications, machine learning, and sensing technologies, autonomous and connected cars are becoming a reality. Many potential applications (e.g., augmented reality for information providing through a heads-up display and accident avoidance in autopilot) requires significant computing power to process data generated by the vehicle sensors for near-real-time responses. Upgrading the on-board computers is one option at relatively high cost. Another solution is cloud computing, where the traditional centralized approach suffers from long latency and unstable connections in a vehicular environment and may congest the backhaul of the network with a large amount of data.

Recently, fog computing (or called “edge computing”), an evolved architecture that migrates the computing from the cloud to the edge of the network, has emerged for next-generation (5G) communication networks. Fog/edge computing can be a more suitable solution for enhancing computational capabilities in vehicular networks via moving the intelligence closer to the vehicles. Processing can be done at road-sided units, wireless access points/base stations at the edge of the network, or even other vehicles as they are not running computationally intensive applications at all times. Despite all the possibilities offered by the fog/edge computing for autonomous and connected cars, the highly dynamic network topology and the tremendous number of cars on roads introduce new technical challenges. For example, how can we achieve reliable and low-latency vehicle-to-vehicle and vehicle-to-infrastructure communications? How can we efficiently manage computing resources of the fog/edge network? Also, information/network security and user privacy issues are important and require in-depth exploration.

This special session intends to collect the latest research findings in addressing the key challenges, such as those mentioned above, and the future directions in leveraging fog/edge computing for autonomous and connected cars.

Topics of Interest

We solicit papers covering novel results on recent research in fog/edge computing for autonomous and connected cars. The topics include, but not limited to, the following:

- New architectures and systems design
- Protocol design and networking
- Resource allocation and management
- Modeling and performance analysis
- Machine learning, deep learning for intelligent management and control
- QoS and QoE provisioning
- Reliability and low-latency communications
- Energy and scalability issues
- Security and privacy issues
- Implementation and testbed

Submission Instruction

Authors should follow the guidelines in “Information for Authors” in the IEEE Transactions on Vehicular Technology (<http://www.it.is.tohoku.ac.jp/~tvt/>) under Information for Authors. Prospective authors should submit a PDF version of their complete manuscript via the journal online paper submission system at <http://mc.manuscriptcentral.com/tvt-ieee>

Important Dates

- Manuscript submission: **Extended to June 22, 2018**
- First editorial decision: Sept. 1, 2018
- Revised manuscript due: Oct. 15, 2018
- Final editorial decision: Dec. 1, 2018
- Final papers due: Dec. 20, 2018
- Estimated publication date: Feb. 2019

Guest Editors

- Prof. Ai-Chun Pang, National Taiwan University, Taiwan
- Dr. Edward Au, Huawei Technologies, Canada
- Prof. Bo Ai, Beijing Jiao Tong University, China
- Prof. Weihua Zhuang, University of Waterloo, Canada