

IEEE TRANSACTIONS ON VEHICULAR TECHNOLOGY

Special Issue on

Machine Learning-based Internet of Vehicle: Theory, Methodology, and Applications

With the significant development of smart vehicles, Internet of Vehicle (IoV) technologies have received widespread attentions. The IoV technology refers to dynamic mobile communication systems that communicate between vehicles and public networks using V2V (vehicle-to-vehicle), V2R (vehicle-to-road), V2H (vehicle-to-human) and V2S (vehicle-to-sensor) interactions. It enables information sharing and the gathering of information on vehicles, roads, and their surrounds.

The actual applications of smart Vehicles and IoV systems meet with many challenges, such as how the big data in IoV can be collected and distributed to the interested vehicles and human beings for the purpose of enhancing the road users' experience, how huge volumes of data can be processed toward reducing the road congestion and improving traffic management and road safety, how to realize quick and efficient communication between a large amount of different kinds of vehicles and smart devices, how to effectively process the large collections of data in IoV systems, or how to protect the privacy.

Many machine learning methods can be used to solve the aforementioned problems. Such methods have a time-variant feature which is crucial to channel modeling in vehicular networking scenarios. They can also minimize the features and rules of the wireless channel in high-speed scenarios. Also, it is possible to utilize machine learning to avoid road accidents by analyzing the driving environment using data collected from sensors, such as video recordings.

In order to work out different problems in the applications of IoV systems, it is essential to define practical challenges and develop related machine learning-based solutions. The goal of this special issue is to provide machine learning theoretical foundations and ground-breaking models and algorithms to solve the challenges in IoV related applications. We invite researchers (both from industry and academia) to contribute their original research articles that will stimulate the continuing efforts to improve the IoV system development based on machine learning technologies, including (but not limited to):

- Machine learning-based IoV system architectures and design
- Machine-learning based vehicular localization and communications
- Machine-learning based vehicular channel modelling, channel estimation and tracking
- Machine learning-based vehicular behavior modelling and environment awareness
- Machine learning-based security, encryption, and privacy for intelligent vehicle
- Machine learning-based based vehicular resource management
- Machine learning-based biometric analysis in vehicular condition
- Machine learning-based vehicle sensing networking and vehicle social networks

IMPORTANT DATES

Manuscript submission: September 1, 2018

Notification of authors: December 1, 2018

Revised manuscripts due: January 15, 2019

Final editorial decision: March 1, 2019

Final papers due: March 20, 2019

Estimated publication date: May 2019

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