IEEE Transactions on Intelligent Transportation Systems (ITS)

Call For Papers

Special Issue on “Space-Air-Ground Integrated Networks for Intelligent Transportation Systems”

Background and Motivation

Next-generation intelligent transportation systems (ITS) are envisioned to greatly improve the transportation safety and efficiency by incorporating wireless communication and informatics technologies in the transportation system. As the cornerstone for ITS, vehicular communication networks enable vehicles to exchange information with other vehicles and the external environments and play a significant role in supporting a variety of services such as road safety, traffic management, and infotainment. The main enabling platforms include dedicated short-range communications (DSRC)-based 802.11p networks and cellular networks. However, these terrestrial networks alone cannot serve the vehicular applications very well in different scenarios, due to the issues of deployment, coverage and capacity. It is imperative to leverage other communication infrastructures, such as low Earth orbit (LEO) satellites, unmanned aerial vehicles (UAVs), and high-altitude platforms, to serve vehicles better, by exploiting their respective advantages in terms of coverage, flexibility, reliability and availability. For instance, densely deployed terrestrial networks, in urban areas can support high-data rate access, satellite communication systems can provide seamless connectivity to rural areas, while HAPs can enhance the capacity for areas with high service demands. The resulting space-air-ground integrated networks (SAGIN) can provision more comprehensive and three-dimensional network connectivity for moving vehicles, anywhere and anytime.

To better support various vehicular services/use cases in a more flexible and effective network environment, different segments in the SAGIN should be efficiently orchestrated. Although it brings many benefits, many technical challenges should be addressed. Firstly, efficient interoperation is required among different networking paradigms. Secondly, multi-dimensional heterogeneity in resources and distinct quality of service/experience (QoS/QoE) requirements pose great challenge to network management and operation. Last but not least, the system should be adaptive to the high spatial-temporal dynamics in traffic loads, mobility, and resource availability. The objective of this special issue is to bring leading researchers and developers from both industry and academia together to present their research to address the fundamental and practical challenges in SAGIN for ITS. High quality original research and review articles in this area are welcome. The papers will be peer reviewed and will be selected on the basis of their quality and relevance to the theme of this special issue.

Scope of the Proposed Special Issue

This special issue will bring leading researchers and developers from both industry and academia together to present their research on SAGIN for ITS. The content of the special issue will focus on the SAGIN network architecture and implementations, interoperation technologies, dynamic access control, resource orchestration, mobility management, QoS/QoE driven network management, performance modeling and optimization, and other enabling technologies in SAGIN for ITS. High quality original research and review articles in this area are welcome. The papers will be peer reviewed and will be selected on the basis of their quality and relevance to the theme of this special issue.

Authors are invited to submit manuscripts on topics including, but not limited to the following:

- SAGIN architecture for ITS
- Enabling interoperation of SAGIN for ITS
- QoS/QoE aware resource management in SAGIN for ITS
- Cooperative computing in SAGIN for ITS
- Information-centric networking in SAGIN for ITS
- Dynamic access control for SAGIN for ITS
- Mobility management in SAGIN for ITS
- Orchestration of heterogeneous resources for ITS
- Artificial intelligence in SAGIN for ITS
- Blockchain in SAGIN for ITS
- Big data analysis for SAGIN for ITS
- Security and privacy of in SAGIN for ITS

**Proposed Schedule:**

- First submission deadline: February 2021
- Notification of first decision: May 2021
- First revision submission deadline: July 2021
- Notification of final decision: November 2021
- Final manuscript (camera ready) submission deadline: December 2021
- Issue of Publication: February 2022

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