# Internet of Things in Intelligent Transportation Systems: Opportunities and Challenges

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**Scope and goal:**
The recent development of the Internet of Things (IoT) brings forward numerous novel technologies whose application scenarios are not only limited to the user level (e.g., individual consumer or private company), but can also be applied to the system level (e.g., commercial or industrial sector). For example, the IoT plays a significant role in the current Intelligent Transportation System (ITS), which is a system consists of vehicular communications, cloud computing, intelligent control, massive data management, and many other elements. By leveraging the IoT, different entities (e.g., vehicles, drivers, riders, infrastructures, traffic management centers, etc) in the existing transportation system get connected with each other, thus making the entire system smarter.

A rising and ubiquitous trend in this IoT context is represented by "digital twin", where a real-time update of big data from the physical world's entities is required to update the corresponding digital replicas in the cyber world. As an extension concept to digital twin, "parallel driving" also considers the mental world besides the physical world and the cyber world, which models the cognitive behaviors of human drivers, with the ability of enabling learning and interaction between the physical and cyber drivers. Both the computing architecture and the communication networks/protocols within the framework of digital twin or parallel driving are built to achieve higher efficiency, fidelity, and reliability.

However, along these developments come a few challenges for authorities, industry, as well as scientific communities. In terms of system design and control, current IoT applications in ITS need to be refined or even redesigned to better function under uncertainties in demand, and to better cooperate with existing conventional vehicles and infrastructures. From the performance assessment perspective, models and simulation tools based on artificial intelligence and big data have been widely developed to verify the performance of IoT applications, in particular taking into account the increasing trends in vehicle connectivity and automation. However, the validity of these models needs to be re-examined with field implementations.

This workshop focuses on sharing the state-of-the-art design, models, algorithms, simulation, and field implementation of a wide range of IoT applications in ITS (such as digital twin and parallel driving), and identifies challenges as well as research needs, aiming to encourage cross-disciplinary cooperation.

**Topics of interest:**

- Parallel driving/transportation
- Digital twin of intelligent vehicles
- Vehicular cyber-physical systems (CPS)
- Internet of things (IoT) in intelligent transportation systems
- Vehicle-to-cloud (V2C) communications
- Remote driving
- Artificial intelligence and big data application in urban mobility
- Modelling and simulation tools for network computing and communication
- New insights from field implementations of Internet of Vehicles (IoV)

**Important dates:**

Paper submission deadline: Mar. 14th, 2020
Notification of acceptance/rejection: Apr. 18th, 2020
Camera-ready version due: May 2nd, 2020
Workshop day: Jun. 23rd, 2020