The increase in vehicle numbers in the urban region has contributed to mobility, pollution of the environment, and road safety issues. Autonomous vehicle technology is reaching the maturity level which gives confidence to end-users to use the roads with unmanned vehicles in many cities around the world. The concept of Intelligent Transportation Systems (ITS) includes a wide variety of advanced technologies, such as communication, sensing, and power, which have been utilized to process massive volumes of information to overcome the issues in the urban region. ITS is a multidisciplinary field covering a wide range of research fields in the advanced transportation sector with various security challenges. The arrival of a digital twin technique can simulate real events and situations precisely to observe and predict security challenges in ITS. Digital twins require to collect data to describe the physical world, the context, events, and situations in the virtual space. The collected details are evaluated based on the enterprise systems to resolve mobility, environmental, and safety issues in the urban region using ITS.

This special issue explores the role of the digital twin in addressing the current challenges of security in an intelligent transportation system. Autonomous vehicles have different capabilities that can impact safety, security, and resilience in a smart transportation system. Artificial Intelligence (AI) based techniques and deep learning frameworks are a subdivision of digital twin technology, which are commonly used for data driven ITS applications to maximize the security and safety of the transportation system.

The special issue is intended to present an up-to-date multi-faceted guide to the theoretical framework of Digital Twin (DT) models and strategies to improve security and safety in intelligent transportation systems. The special issue welcomes original contributions and review papers on Digital Twin for security challenges in the Intelligent Transportation System.

The potential topics include, but are not limited to:

- Machine learning for smart city, smart home, smart transportation
- Digital Twins integrated with IoT for smart transportation
- Data-driven scenarios based on Digital Twin leveraging AI
- Real-time simulation/estimation for ITS
- Big data technologies for traffic control, traffic management, and vehicle network terminal technologies
- Deep learning-based security, integrity, and privacy solutions for ITS
- Low power-based deep learning techniques for autonomous vehicles
- Optimizing safety and security of ITS using Artificial intelligence
- Deep learning-based software-defined network (SDN for ITS)
- Security hardening in Intelligent Transport System using AI
- Innovative deep learning techniques for attack identification, mitigation, and prevention in ITS
- AI for the incorporation of sensing and communications in ITS
- Deep learning-based 4G/5G/6G communication for ITS