

# **Towards Vehicle-to-Infrastructure Connectivity, Location Privacy and Trust Management in Vehicular Network**

## **Abstract**

The vehicular network is in its flourished stage, and its various applications related to safety, traffic efficiency, and infotainment have made it more appealing. This thesis explores the vehicular network in detail, associated challenges, existing solutions from the research community and standardization bodies, state-of-the-art solutions, and future research directions. The work in this thesis focuses on three key challenges related to seamless vehicle-to-infrastructure connectivity, location privacy, and trust management. The first contribution of the thesis is towards the vehicle-to-infrastructure (V2I) connectivity issues. The second contribution of the thesis is towards the location privacy issues in a vehicular network. First, we propose a scheme called masqueraded probabilistic flooding for source-location privacy (MPFSLP) that provides non-repudiation, message authentication, integrity, and non-traceability to a great extent. We also propose a second scheme named cooperative pseudonym exchange and scheme permutation (CPESP) with the same objective. In this thesis, we also address another important challenge, trust management issue in a vehicular network. We propose a blockchain-based decentralized trust management system to address the critical challenges of existing and traditional centralized and decentralized solutions.

