Wireless Communication and Vehicular Networks Overview

Vehicle-to-Everything (V2X) communications, as a promising solution for road safety improvement and traffic efficiency optimization in smart cities with massive connected vehicles, have recently gained extensive attention from academies and industries. Global demand for V2X communications is projected to continue growing over the next decade, the market for V2X communications will grow to more than 1.4 billion US dollars by 2021. The vision for such V2X networks is to interweave technology into our everyday life and improve the safety and quality of driving experience. While the vision is promising and exciting, there are several challenges to achieve this goal. One of the critical challenges is how to manage the resource allocation (i.e., allocate transmission power and spectrum) for all vehicles in this V2X communication networks. The objective of this research is to develop a novel approach that bridges the gap between the advanced theoretical research and testbed experiments to address optimal resource allocation in vehicle communication networks. We propose a new distributed schemes that ensure reliable, efficient, and smart communications in vehicle networks.