Motivation for VCWS Protocol

This project and paper proposes a protocol for a vehicle collision warning system. You can predict the possibility of a collision based on the status information shared by the vehicle. Information exchange is made possible by the mobile ad hoc network formed by vehicles. Multiple invariants have been introduced in different scenarios to anticipate potential collisions and reduce unwanted warnings. The forward collision warning mechanism is designed to broadcast a warning message in a scenario where a vehicle in front collides.

Vehicle Collision Warning Systems (VCWS) are usually made up of hardware, processing resources, and a communication network. Radar, infrared ray, speed sensor, GPS devices, and other apparatus devices are utilized to obtain a holistic image of the vehicle's status and surrounding environment, while computing resources enable message processing and computation. The communication network and the protocols that operate on it are probably the most difficult aspects of VCWS. The VCWS communication network differs significantly from standard Wireless Sensor Networks (WSN).

Mobility. In a VCWS communication network, computing nodes contain vehicles that can move quickly, whereas in a standard WSN, nodes are immobile or move at slower speeds. As a result, while evaluating broadcast frequency and range for VCWS, communication protocols must account for the rapid speed of nodes.

There is a lag in transmission. A VCWS's goal is to improve transportation security, such as by minimizing vehicle crashes. When warning signals are transmitted to vehicles in a timely manner, they can alert drivers to potential threats and give them enough time to react. As a result, the transmission delays of safety-critical messages are subjected to more strict requirements.