VANET: Evaluating Smart Parking Performance in a Dublin Scenario

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Traffic congestions and pollution is a major issue in many cities worldwide. Drivers cruising for parking spaces contribute heavily to these issues. For this reason, many researchers have performed studies on the topic of smart parking, as well as VANET. With the introduction of smart parking, drivers can know where vacant parking spaces are. However, as an argument proposed by this dissertation, the surfacing of parking space information is not enough. Simply by knowing a parking spot is vacant does not guarantee any driver a parking spot. A solution must be found to minimise the chances of a driver arriving at a parking spot that became occupied minutes beforehand.

VANET is a technology that supports inter-vehicular communications. VANET technologies allow vehicles to communicate with other vehicles to ensure driver safety. As well as this, vehicles may relay information to Road Side Unit (RSU) for traffic light coordinate as well as traffic queue management. This work is concerned with the integration of a smart parking system supported by VANET.

Dublin City is the domain of interest in this dissertation. For this reason, Dublin City-specific data is acquired from various sources. The data is used in the simulation to build a realistic view on the current parking behaviours of Dublin City. This work is concerned with using a simulation software to build a VANET smart parking system evaluated on Dublin City. Vehicles communicate with each other regarding parking space occupancies and vacancies. This involves the integration of Dublin specific traffic and parking data into the simulation.

The evaluation process involves comparing a baseline model to the VANET model as described above. The evaluation results show that VANET smart parking model minimises the amount of emissions produced. As well as this, a VANET smart parking model minimises the chances of drivers arriving at parking spots that are occupied minutes beforehand.