



Traffic safety through Cooperative Automated Vehicle 'herd immunity'

Problem description

With the introduction of Automated Vehicles (AV), there is still much to be considered in regard to safety. Actually, many of the main advantages of AVs will only come about with CAVs (Cooperative/Connected Automated Vehicles) that make use of wireless communication to enhance safety and traffic flow. Wireless communications will allow vehicles to inform each other of the movements, intentions, and circumstances elsewhere on a road. When this happens, vehicles will be able to safely drive at short gaps, react faster and more informed.

A well documented downside of CAVs is that a specific critical density is required before these benefits start to materialise. But, once they do, an ecosystem to absorb driver error and other unsafe situations can be achieved that may heavily outweigh the relatively safe human driven traffic flow we currently have. This increase in numbers can, to a certain extent, be compared with vaccinated immunity that exist in infectious diseases, such as the current Covid-19 outbreak.

Objectives & Assignment

The objective of this project is to design and implement a model of CAV 'immunity' to increase safety as a greater share of CAVs become available. The model should be able to indicate the level of traffic safety as a function of CAV penetrate rate and other key variables. To do this, literature review of current CAV development and safety is required, as well as of herd immunity and basic model developments. Thereafter, the student would be expected to design a conceptual model that will be elaborated and developed into a quick-scan style simulation model for analysis as a proof of concept.

This project will require traffic modelling and some basic programming, but more so a creative and innovative mind-set.

Research group

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Information

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