Optimisation of Hybrid Vehicle Energy Using Big Data by Providing Feedback to the Driver

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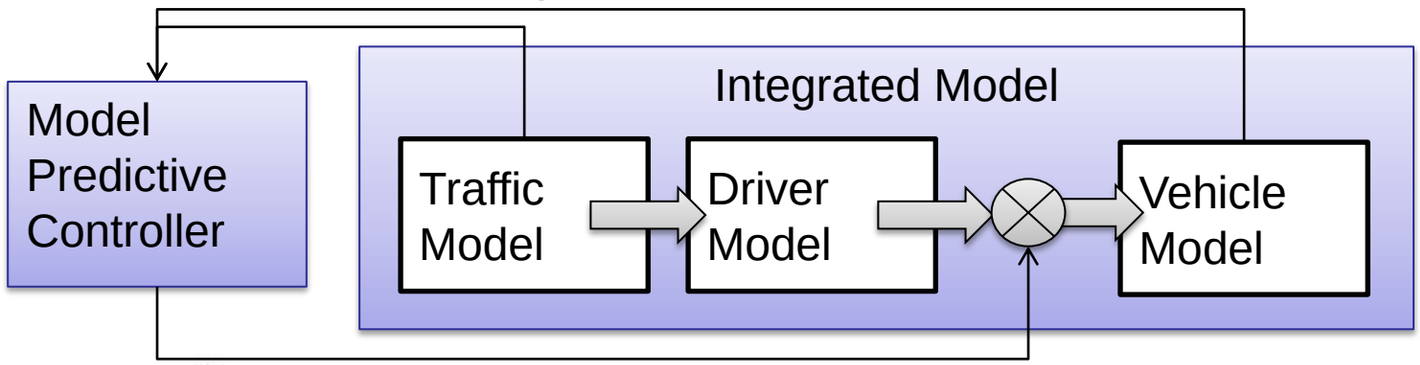
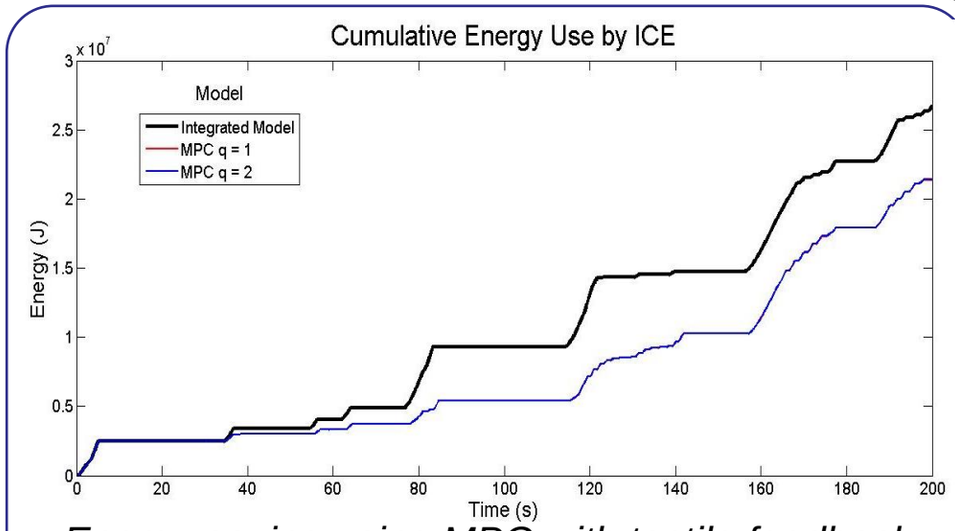
Introduction

With the growth of connectivity in the automotive industry, it has become possible to send vehicle parameters from car to car to predict future driving events. The aim of this project is to investigate the potential energy savings by using connectivity data to influence aggressive driver behaviour through use of a tactile driver feedback system.

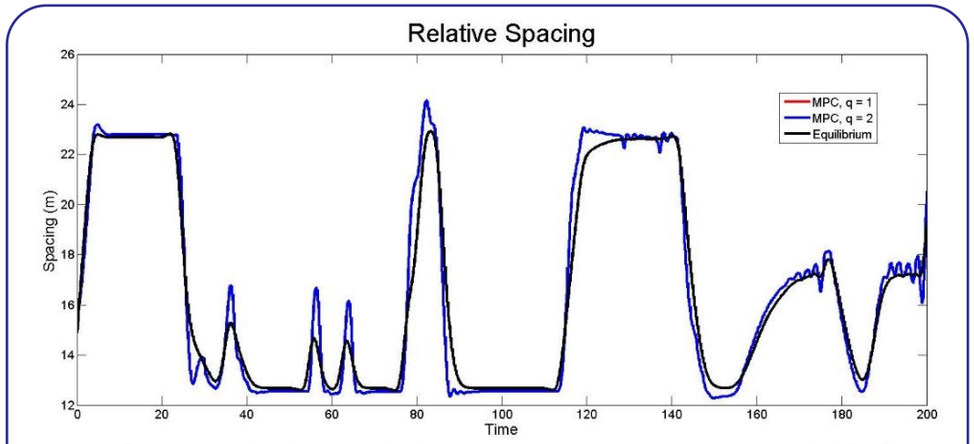
Method

- Traffic simulates currently unavailable connectivity data
- Driver model simulates response to tactile feedback
- Vehicle model to show vehicle dynamics in response to driver model and show energy consumption
- Model Predictive Controller to find optimum driving regime





Energy saving using MPC with tactile feedback



Controlled car following spacing using MPC

Conclusions

The results from this preliminary study confirm the potential of a tactile feedback system using connectivity data to deliver a reduction in fuel consumption of a hybrid vehicle in a simulated urban environment.

As a result of this direct feedback to the driver, the controller was able to deliver a 20% reduction in fuel delivered to the ICE, and a 17% reduction in total energy use by the vehicle over a 200s journey simulation.

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