

Project Title: **Vehicle Simulation & Data Gathering**

Supervisor: **TBC**

Project details:

Vehicle simulation is widely used in the modern automotive industry to predict fuel efficiency and perform sensitivity analysis on different vehicle parameters in order to better inform design decisions. An accurate model is useful both initially during the design stage, and to better inform race strategy once the vehicle is built.

This project focuses on building and evaluating a detailed model of the new vehicle using Matlab Simulink, a widely-used simulation tool. The starting point will likely be a standard electric car model provided by MathWorks; this will then be adapted for our particular vehicle. While the model can be evaluated using past race data, given the change in direction for the new vehicle, a detailed test plan will need to be made for the final vehicle in order to fine-tune the model. There is also scope for designing a speed controller in order to maximise the cruising efficiency of the vehicle.

The second, smaller, focus of this project is to design or choose sensors to install in the vehicle to collect useful data. Currently, data collection is limited to a few key electrical parameters. However, there is great potential for collecting a much wider range of measurements, such as tyre pressures and solar intensity. The project will use the Simulink model in order to determine the most important parameters to measure.

This project will give useful experience in using an industry-standard tool for a complex system. It will also help build a good overall understanding of an electric vehicle, especially in terms of which factors are the most important in making an efficient vehicle design.

Closely linked projects: "Driver Interface & Telemetry"

Desired Skills and Experience:

*Note: These are not essential (unless listed in **bold**) and those who receive roles will be offered training to compensate for any gaps.*

- **Experience with Matlab and decent programming ability**
- Experience with Simulink (strongly preferred)
- General awareness of where the energy losses occur in an electric vehicle
- Completion of the 3rd year GF1 control systems project would be useful (but not required)
- Good communicator of ideas
- Willing team player
- Prior interest/experience with solar cars/CUER
- Flexible and able to work to tight deadlines