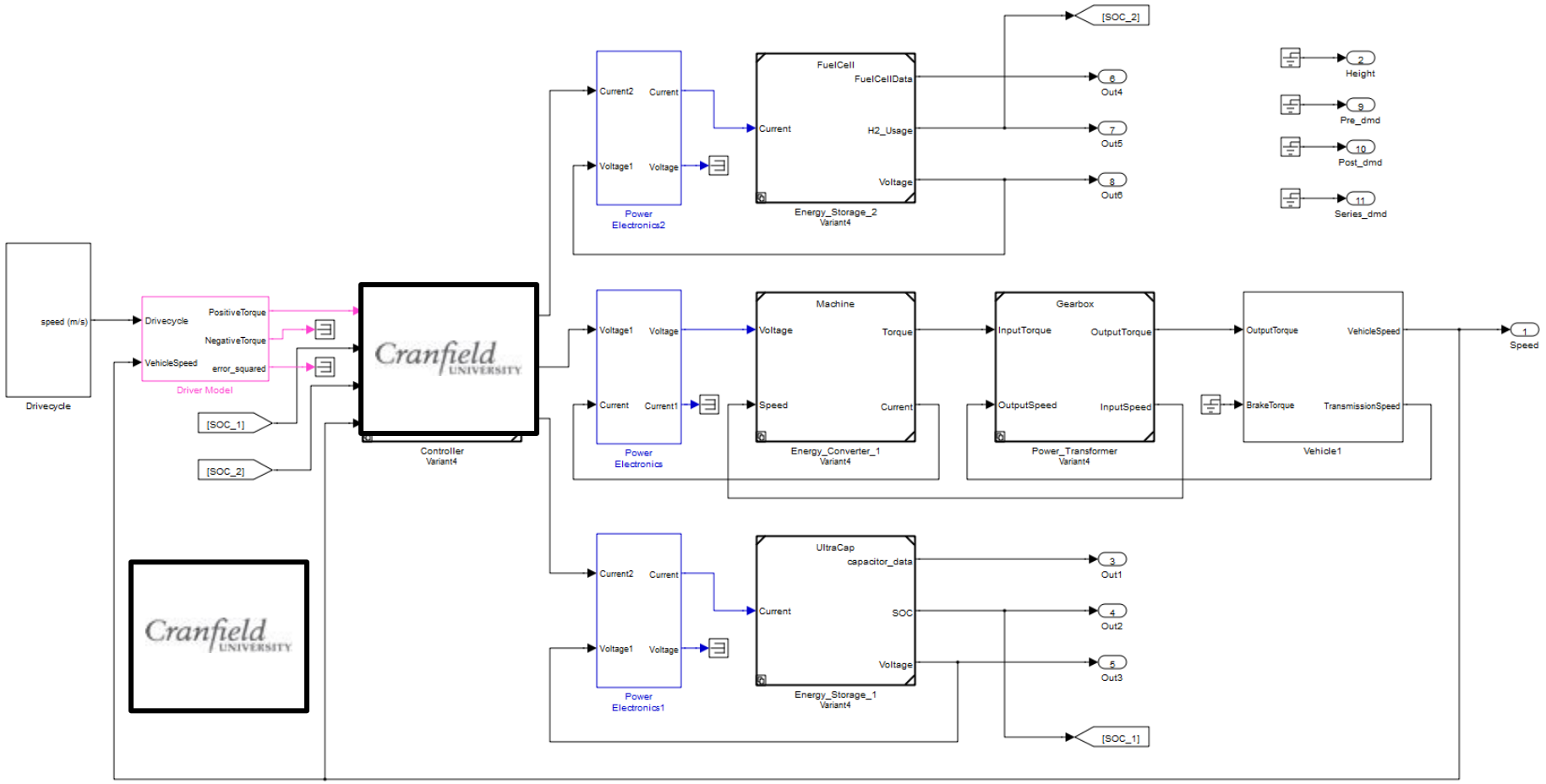
THE BIG PICTURE



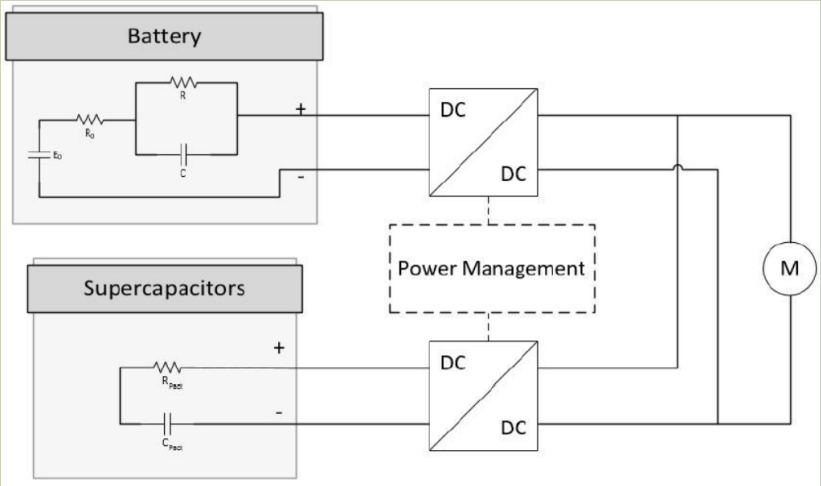
WORK PACKAGE OBJECTIVES

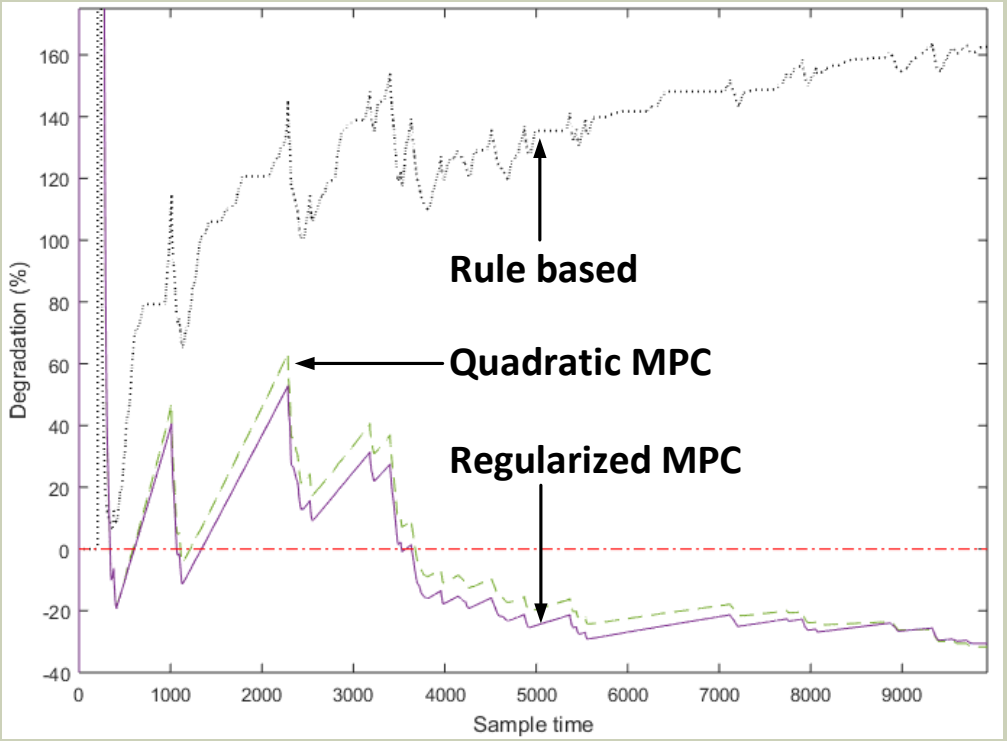
- Development of **system optimisation and control** techniques
- Design of control strategies to **minimise components degradation**
- Development of a **hardware-in-the-loop** test rig

CONTROL FOR BATTERY DEGRADATION

- Optimal power management to minimise **battery degradation**

CONTROL FOR BATTERY DEGRADATION

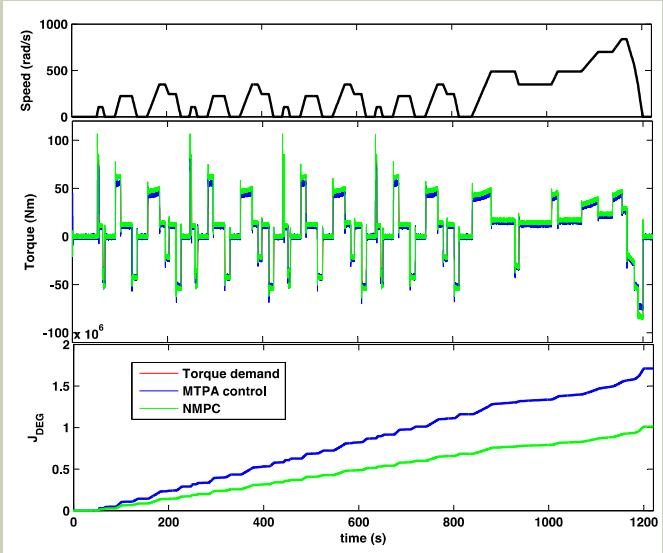


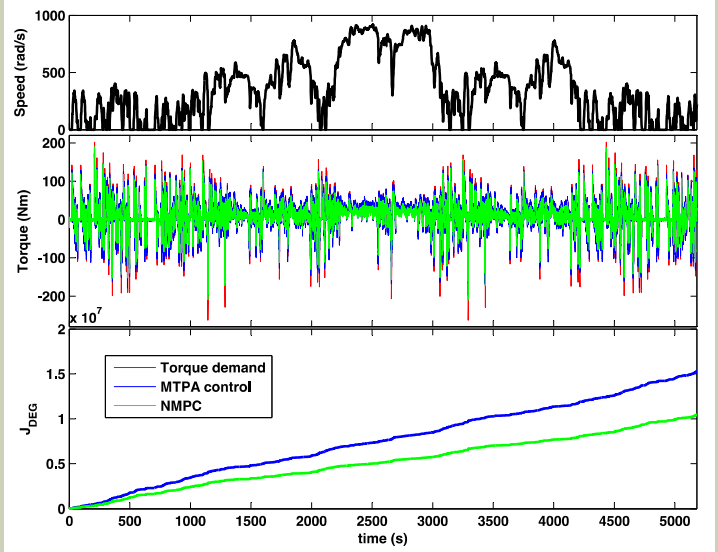


CONTROL FOR MOTOR DEGRADATION

- Optimal power management to minimise **battery degradation**
- Optimal control to minimise **motor degradation**
  - *By optimally controlling a single motor*

CONTROL FOR MOTOR DEGRADATION



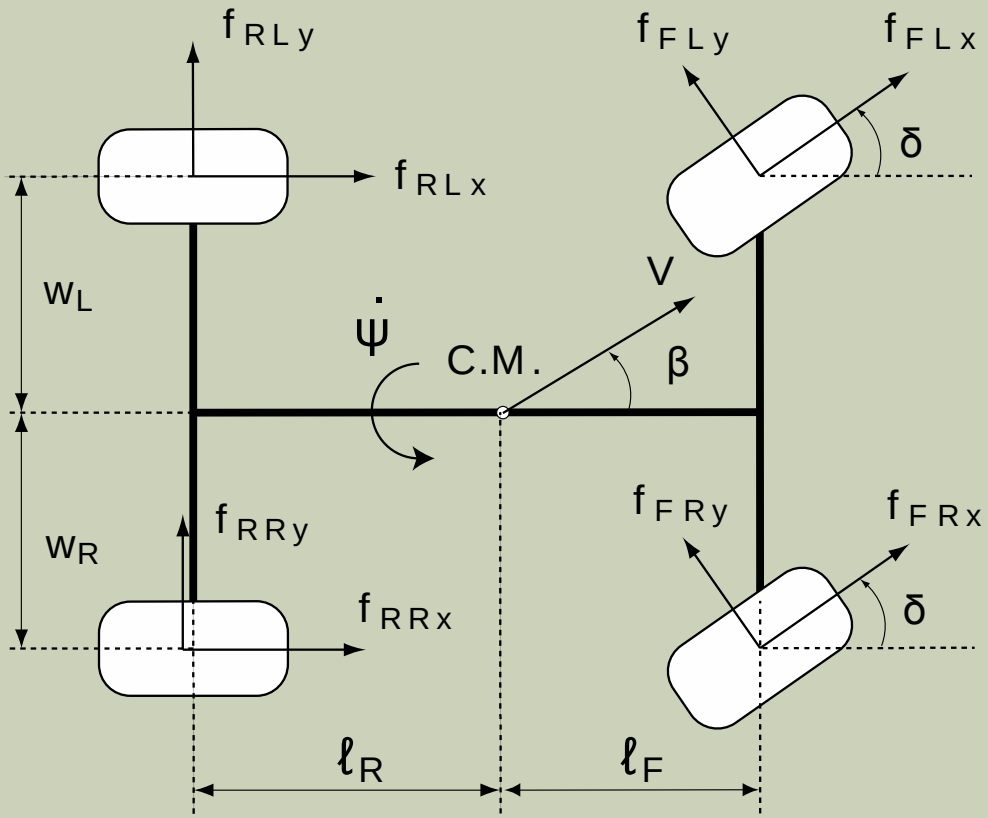


CONTROL FOR MOTOR DEGRADATION

- **Battery state estimation** using nonlinear filtering techniques

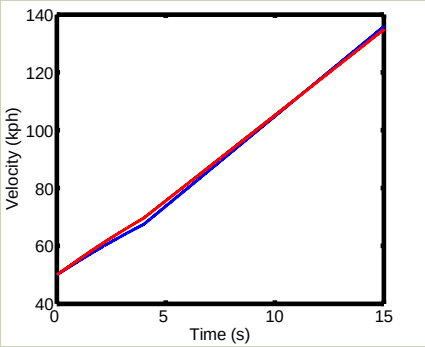
- Optimal control to minimise **motor degradation**
  - *By optimally controlling a single motor*
  - *By optimally distributing the torque among motors*

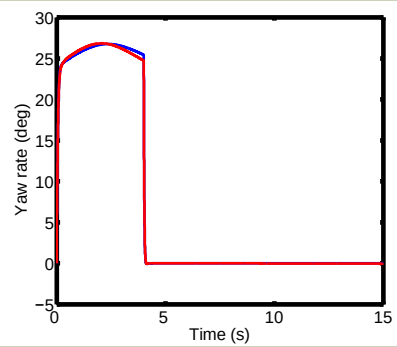
FOUR-WHEEL VEHICLE MODEL

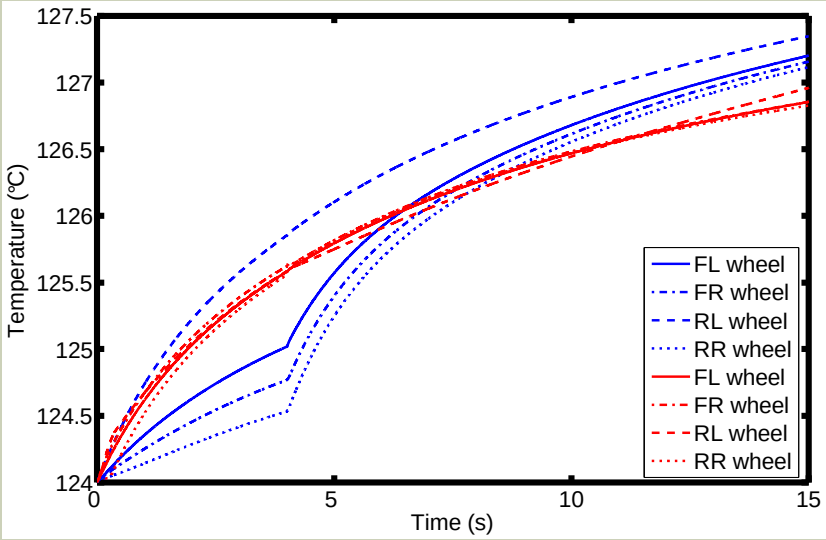


SIMULATION RESULTS

Normal driving







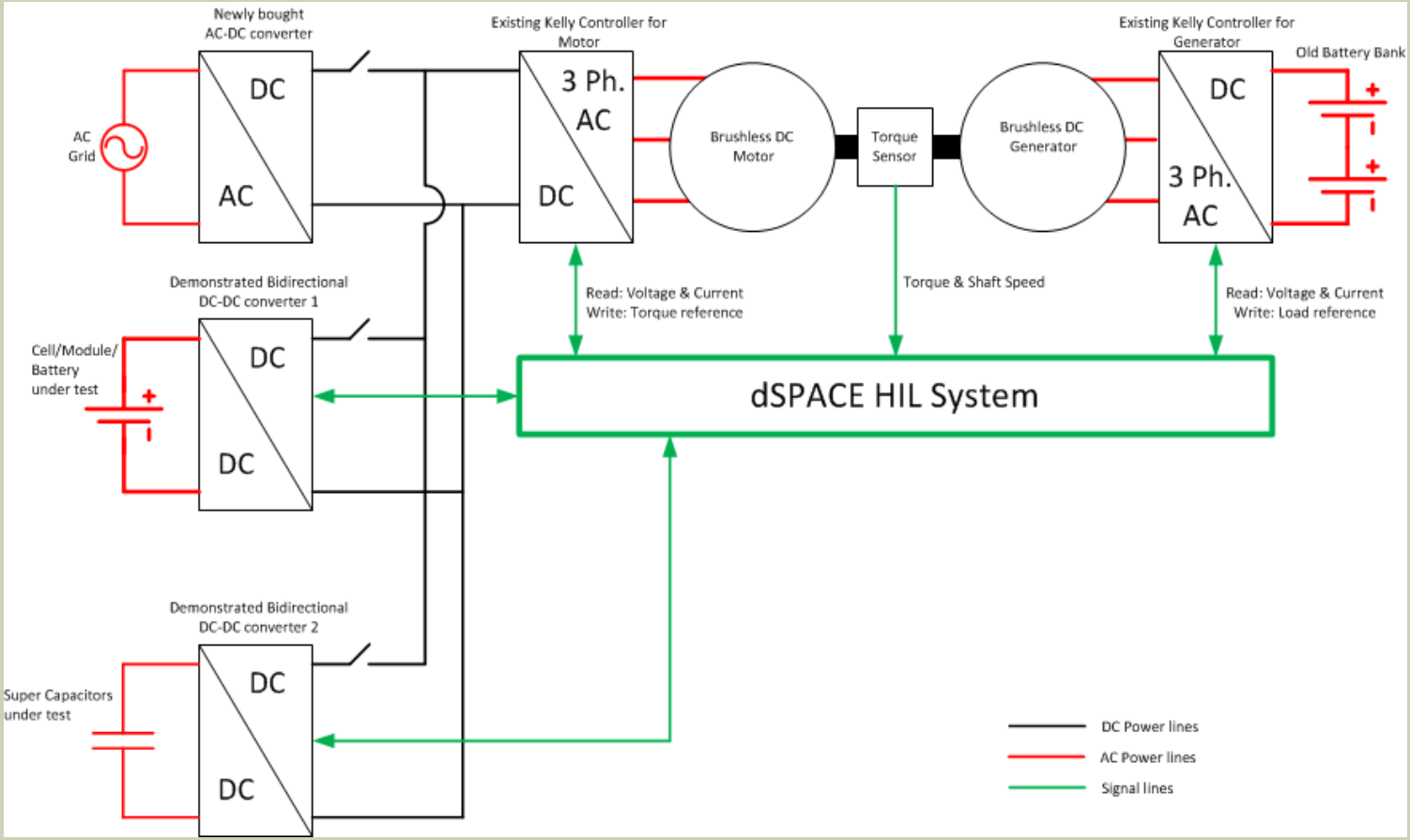
uncontrolled

controlled

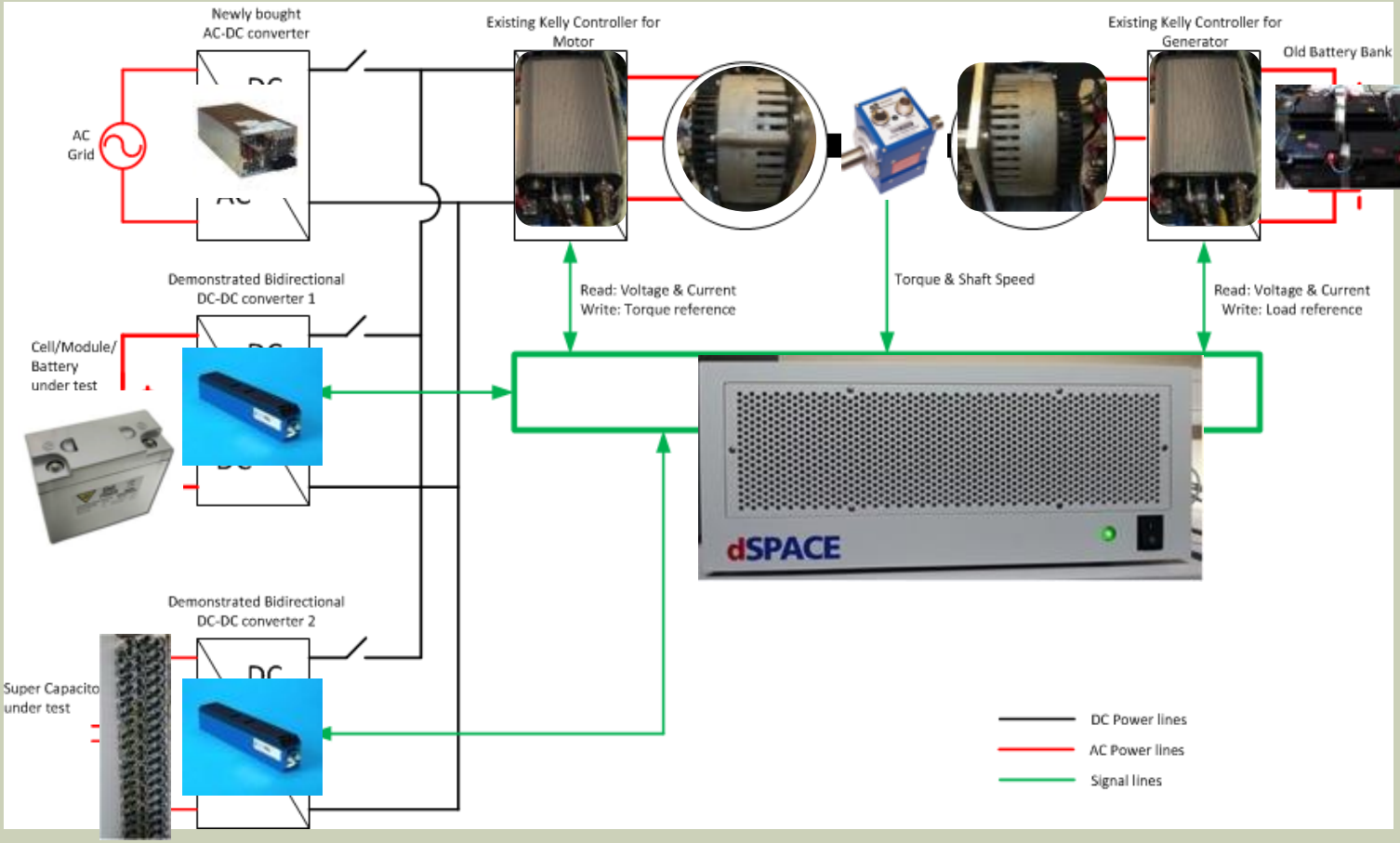
HIL DEVELOPMENT

- Optimal power management to minimise **battery degradation**
- Optimal control to minimise **motor degradation**
  - *By optimally controlling a single motor*
  - *By optimally distributing the torque among motors*
- **Hardware-in-the-loop** development for powertrain testing

HIL DEVELOPMENT

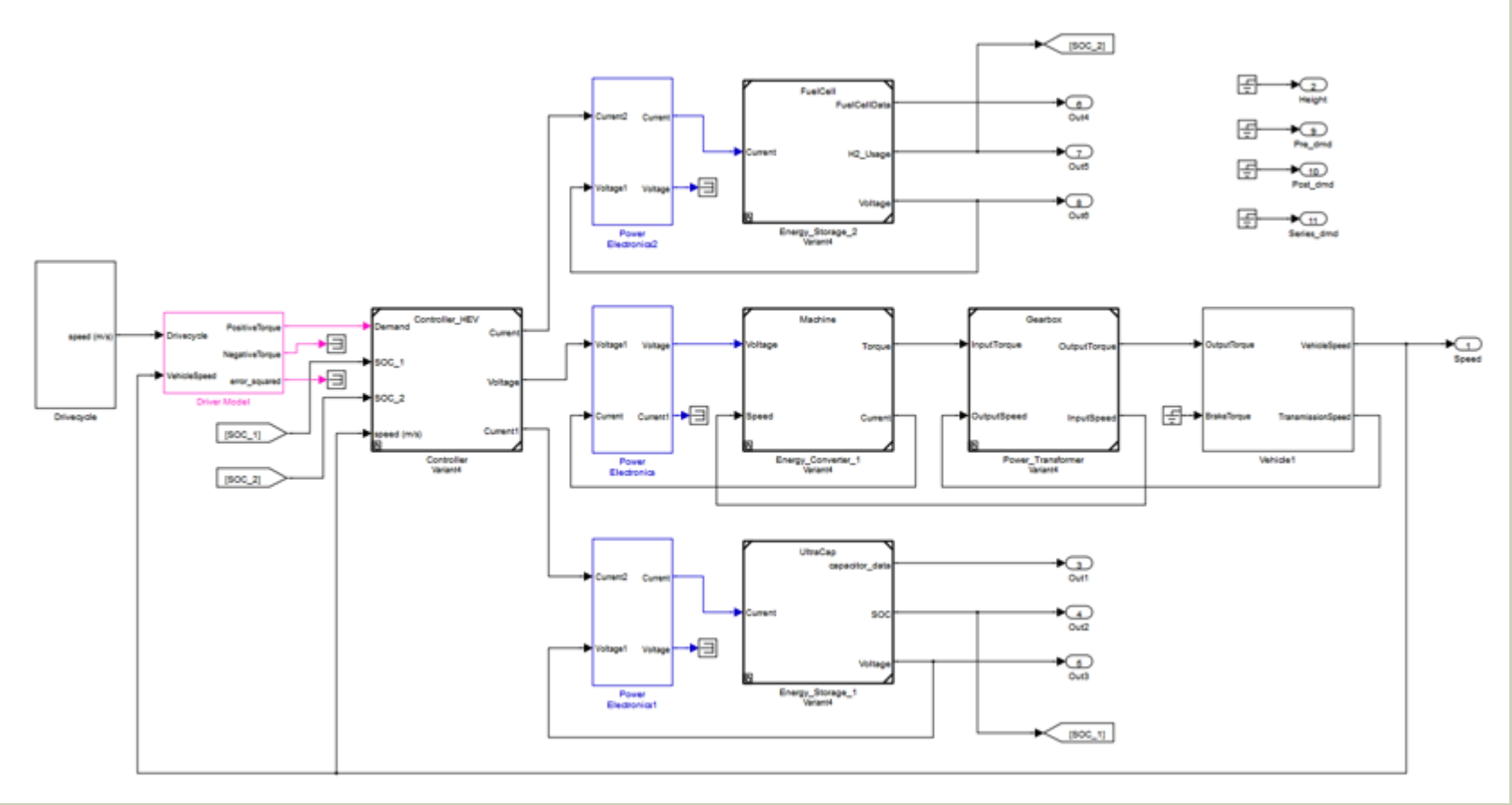


HIL DEVELOPMENT



HIL DEVELOPMENT

Hardware-in-the-loop development for powertrain testing



THANK YOU


EPSRC
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