Expertise

The Energy Systems Integration Laboratory (ESIL), is part of the Birmingham Science City initiative, and further enhances the group's expertise and technical capabilities by bringing together cutting edge dynamometer test equipment, high power drives, simulation and instrumentation technologies to provide a highly flexible research facility for the evaluation and design of traction systems.

Simulation

The group has a long standing history in railway simulation, with an application portfolio that includes the internationally renowned MTS and STS railway simulation tools. These are used around the world by international consultancies and railway operators, for modelling railway networks and vehicles to determining operating characteristics and requirements for network optimisation and rolling stock procurement.

Over the past two decades the simulation tools developed at the group have been used by high profile clients ranging from global consultancies to government transportation authorities.

Instrumentation

The group boasts a long standing history in the design and development of custom hardware for precision instrumentation of railway systems. Our capabilities range from evaluating the operation of track circuits and track geometry degradation, to high resolution electric and kinetic parameter capture of DC railway networks. Complex sensing and data logging systems developed in-house allows the capture of every aspect of any electro-mechanical system and thus allowing the investigation and development of a multitude of condition monitoring and fault detection technologies.

Optimisation

The group has developed considerable expertise in the development of advanced control strategies for current and future railway vehicle control, with an emphasis on supervisory control and advanced driving strategies for hybrid, diesel multiple unit and electric vehicles. Current research projects include the modelling and evaluation novel control strategies for diesel vehicles to reduce fuel consumption, future hydrogen fuel cell vehicle performance optimisation and component sizing and selection for increasing performance and cost effectiveness of hybrid power systems.

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