

RANGE EXTENDED ENGINE MANAGEMENT SYSTEM FOR ELECTRIC VEHICLES

Daniel Paluszczyszyn, Moath Al-Doori, Warren Manning, David Elizondo, Rupert Gammon and Eric Goodyer

De Montfort University Interdisciplinary Group in Intelligent Transport Systems (DIGITS)

The Gateway, Leicester, LE1 9BH, UK

1: Aims and description

Aimed to improve the mechanical performance models used to establish a range-extension methodology, and to introduce the use of computational intelligence (CI) to operate a real-time range extension engine management system to replace the current algorithmic approach.

The vehicle will be instrumented to obtain the required input parameters.

Artificial neural networks will be developed that will represent the optimum drive characteristics, using a range of live inputs and results of the mechanical modelling study.

Multi-objective non-linear optimization problem with multiple input variables and multiple constraints.

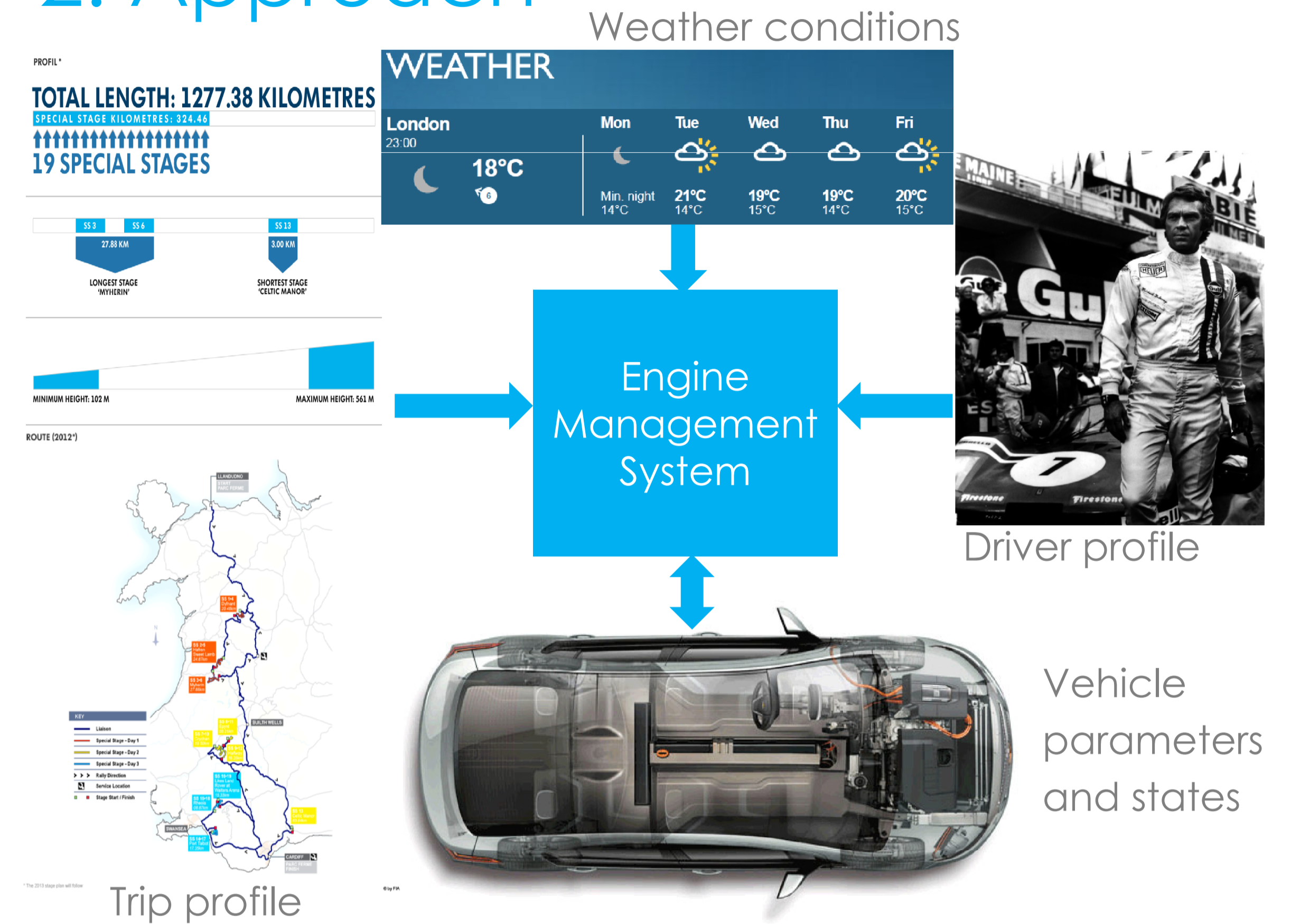
Aimed to help to overcome market resistance to electric vehicles take-up.

The performance model will be based on real-time analysis of the vehicle operation, and will be tuned to each vehicle.

The proposed system will include a journey planner, with real-time trip analysis that will take account of road conditions for the whole journey and driver profile.

A test laboratory will be developed capable of monitoring and analysing the real-time performance vehicles

2: Approach

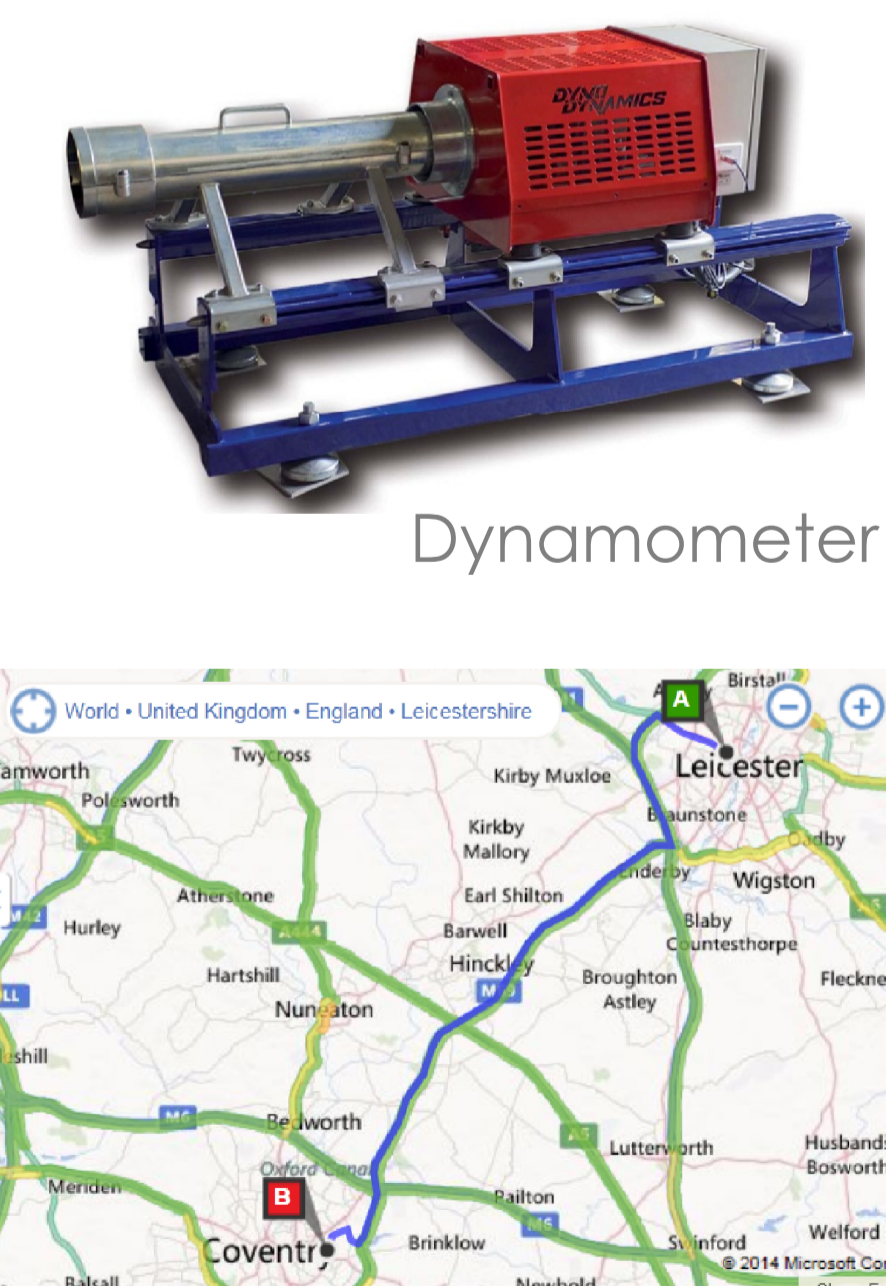


3: Range-extension methodology

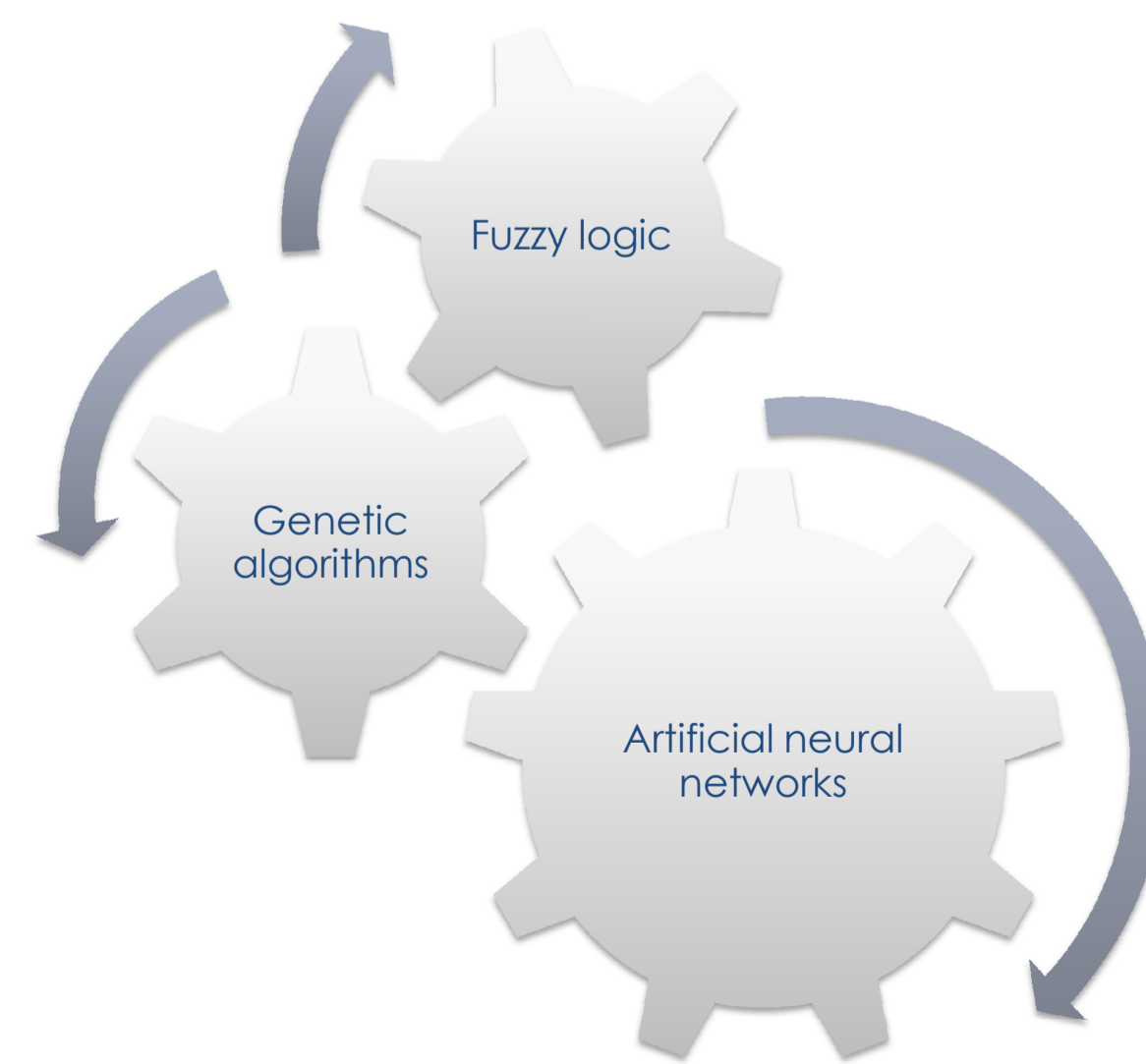
Stage 1: Equipment selection



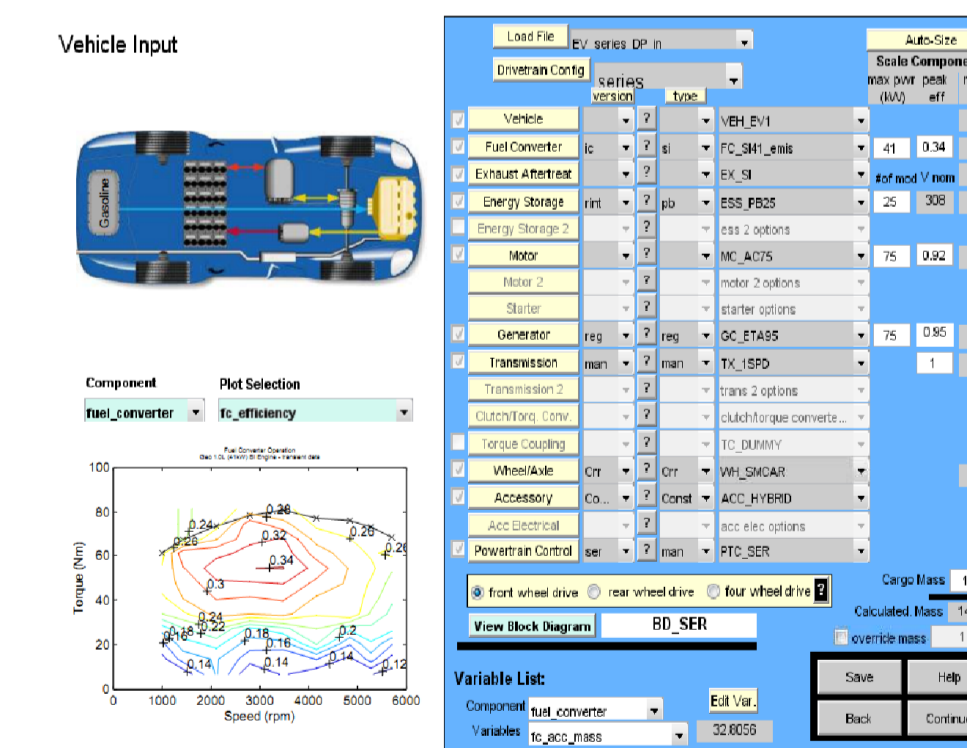
Stage 2: Data collection



Stage 3: Development of CI-based algorithm



Stage 4: Evaluation via simulations



Stage 5: Real-world evaluation



Range extender