

Full-day G-Active Workshop on:



Road vehicle energy management and eco-driving

Linking academia and industry to cut emissions of conventional, hybrid and connected vehicles by a multidisciplinary approach

University of Southampton

11:00 – 17:00 on 14 November 2018

Register at: gactiveworkshop.eventbrite.co.uk

Scope of workshop:

“Novel approaches to energy management and eco-driving” aims at bringing together and encourages collaboration between communities and researchers interested in:

Novel, multidisciplinary approaches to fuel saving and emissions reduction of future connected vehicles including energy management control strategies, driver modelling, traffic modelling, user interface design, and beyond.

Both academic and industrial participants from several related fields, such as automotive engineering, traffic modelling, human factors, and control engineering are encouraged to attend. The workshop is organised by several members of the G-Active (Green Adaptive Control for Future Interconnected Vehicles) project (EPSRC grant no. EP/N022262/1), which is a multidisciplinary research project targeting fuel saving and emissions reduction involving researchers from the University of Southampton, Imperial College London and UCL. The workshop will include presentations by current project members as well as external speakers from **BMW Group**, the **Knowledge Transfer Network** and the **Ford Motor Company**.

Organising committee:

Prof. Roberto Lot, *University of Southampton, UK*

Dr Simos Evangelou, *Imperial College London, UK*

Dr Bani Anvari, *University College London, UK*

Dr James Fleming, *University of Southampton, UK*

For more information about the workshop, contact:

Dr James Fleming - J.M.Fleming@soton.ac.uk

Register here:



More information on
<http://g-active.uk>



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Workshop Program at a Glance:

Time	Title	Presenter
11:00-11:30	Registration, Tea and Coffee	
11.30-11.40	Welcome	Prof. Neville Stanton <i>University of Southampton</i>
11:40-12:00	Overview of the G-Active project	Prof. Roberto Lot <i>University of Southampton</i>
12:00-12:20	Traffic prediction modelling	Dr Bani Anvari <i>University College London</i>
12:20-12:40	Overview of hybrid energy management and vehicle speed optimisation	Dr Simos Evangelou <i>Imperial College London</i>
12:40-13:00	Predictive energy management for plug-in hybrid electric vehicles based on optimal control - an industry perspective	Dr Johannes Bürger <i>BMW Group</i>
13:15-14:00	Lunch Break	
14:00-14:20	Novel heuristic approaches to energy management of parallel hybrids	Dr Xuefang Li <i>Imperial College London</i>
14:20-14:40	Driver modelling and optimisation of vehicle speed in a driving simulator	Dr James Fleming <i>University of Southampton</i>
14:40-15:00	Ecological driver assistance system with driver-in-the-loop	Dr Xingda Yan <i>University of Southampton</i>
15:00-15:20	Eco-driving assistance system in the simulator: A little help can go a long way	Dr Craig Allison <i>University of Southampton</i>
15:20-15:40	Technology advancements in the EV space and opportunities for funding	Ryan Fisher <i>Knowledge Transfer Network</i>
15:40-16:00	Visualisation is critical to human-centred design innovation	Brian Rutter <i>University of Bath</i> <i>Ford Motor Company (formerly)</i>
16:00-17:00	Tea & Coffee, Networking	
16:00-17:00	Visit to Southampton University Driving Simulator (registration required)	



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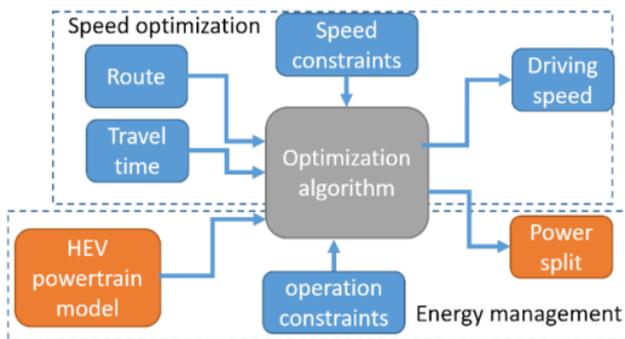
About the G-Active project:

The G-Active project targets a **reduction in fuel consumption** and **CO₂ emissions** in road transport by implementing energy management and driver assistance systems that are inclusive, predictive and adaptive. The ultimate goal is to reduce fuel consumption of road vehicles by more than 5%.

A key objective is to **maximise user acceptance** of these technologies by intelligent design of user interfaces and **by adapting to different driving styles** in real time, which is carried out using new models of driver behaviour. Further goals include incorporation of **traffic predictions from V2X technologies**.

G-Active success stories:

- Built a **low-cost** device to collect **naturalistic driving data**.
- Developed an **adaptive driver model** to represent real-world driver **speed and acceleration** choice.
- Developed a framework to trade-off **driver preferences, fuel consumption and emissions reduction**.



- Developed an **intelligent air conditioning controller** that saves **9% of A/C fuel usage** (1-2% of vehicle fuel usage).
- Proposed novel **heuristic control algorithms** for hybrid vehicle energy management which is **2-4% more fuel efficient than state-of-the-art** algorithms.
- **Defined implementable solutions** to intractable **joint optimization of energy management and vehicle speed profiles**.

- Developed a **driver assistance system** to recommend driver actions to assist **eco-driving**.
- Designed a smart **user-interface** using **cognitive work analysis**.
- Evaluated the proposed system through extensive **simulations at the University of Southampton**.



- Proposing a novel approach to **predict** traffic flow in **real time** using historical and **V2X traffic data**.
- Studying the integration of the **traffic prediction method** into **real-time optimisation** of vehicle **speed profiles**.



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