UNIVERSITY OF
SURREY

BEHAVIOURAL ISSUES IN THE ADOPTION OF ELECTRICAL VEHICLES

ONLINE EVENT
WORKSHOP PROGRAMME

24 September 2021

ORGANSING COMITTEE

The University of Surrey has been recognised by the National Cyber Security Centre (NCSC) as one of a small number of universities to achieve the status of both an Academic Centre of Excellence in Cyber Security Research (ACE-CSR) and an Academic Centre of Excellence in Cyber Security Education (ACE-CSE). SCCS is a key element of the University's digital activities, collaborating on AI research within the Computer Science Department and the Centre for Vision, Speech and Signal Processing (CVSSP), and also with the 5G Innovation Centre – the UK's largest academic research centre dedicated to developing next generation mobile and wireless communications. More widely, SCCS consolidates research activities in cyber security across the University, bringing together expertise within the Department of Computer Science and actively collaborating with the University's departments of Electrical and Electronic Engineering, Sociology, Psychology, Law, Politics and Business to create a rich set of perspectives on cyber security. Find out more about SCCS by clicking here.

The Decarbonising Transport through Electrification (DTE) Network+ is a £1M EPSRC-funded multidisciplinary project addressing the challenges of implementing an electrified, cost-effective and holistically operating transport sector for the UK. Interdisciplinary teams from Cardiff, Birmingham, Cranfield, Bristol and Southampton Universities are exploring drivers for change within the transport sector including technological innovation, individual mobility needs and economic requirements for change, alongside environmental and social concerns for sustainability and consider the role, social acceptance and impact of policies and regulations.

The DTE network+ brings together industry, academia and the public sector to identify the challenges limiting current implementation of an electrified, integrated transport system across the automotive, aerospace and rail sectors.

The DTE network+ focuses research expertise to address the challenges of interactions between energy networks, future electric vehicle charging infrastructure (including roadside wireless charging & the shift to autonomous vehicles), electric & hybrid aircraft, and electrification of the rail network.

Workshop chair:
Professor Helen Treharne, University of Surrey

Organising committee:
Dr Irina Cojuharenco, University of Surrey

Dr Rose Martin, University of Surrey

Dr Saber Fallah, University of Surrey

Dr Sotiris Moschoyiannis, University of Surrey

Professor Nishanth Sastry, University of Surrey

Konstantinos Stamatis, University of Cardiff, EPSRC DTE, Network Manager

Administrative support:
Ele Pucci, University of Surrey

INTRODUCTION

The workshop aims to bring together researchers and industry colleagues to create a community and develop a shared understanding of the common challenges in adoption EVs and electrified transport.

Emerging technologies for electric vehicles (EVs) offer a plethora of advances including battery management, adaptive control, in-car payment and charging infrastructure but how do users feel about adopting electric vehicles?

Behavioural science enables us to obtain a better understanding of users' decisions and behaviour, but more is needed for the insights from behavioural science to affect the design of emerging EV technology and infrastructure.

The aim of this workshop is to shed light on how EV technology needs to be designed to work with real users in mind in order to facilitate and promote the adoption of EVs. We propose to use EVs as a context to provide a focus for the workshop, but we are keen to extend the focus to cover all types of electrified transport.

When considering the adoption of EVs system design questions raise both technology and behavioural issues. The following table poses questions tagged with concepts/phenomena from psychology, management science/economics that may be examined using electrified transport as a novel and impactful context for the study of human behaviour.

1 - CAPABILITY. How can individuals develop more favourable perceptions of their capability to use EVs? What policies/interventions may help different categories of users? What is the role of technology in helping user EV capability?	Influence/persuasion, learning, self-efficacy
2 - OPPORTUNITY. How can individuals develop a more favourable view of opportunities to use EVs? How do opportunities/perceived opportunities differ for different categories of users? What is the role of technology in offering greater opportunities for EV use?	Building awareness, framing, heuristics and biases
3 - MOTIVATION. What may motivate individuals to use EVs? How do motivations differ by categories of users? What technologies do users seek? What are the perceived risks and harms (e.g., of using public charge points)?	Motivation, incentive-compatibility, identity, attitude change, ethical decision-making

PROGRAMME

(UK time)
09.45 – 09.55	Welcome and Introduction - Prof Helen Treharne

RESEARCH PRESENTATIONS

09.55 – 10.10	Dr George Beard
10.10 – 10.25	Dr Dimitris Potoglou
10.25 – 10.40	Dr Nikolas Thomopoulos
10.40 – 10.55	Dr Sotiris Moschoyiannis and Dr Saber Fallah
10.55 – 11.15	Q & A
11:15 – 11.30	Break
11.30 – 11.40	Introduction to breakout sessions - Dr Rose Martin
11:40 - 12:30	Break-out rooms
12:30 - 12:45	Break
12:45 - 13:35	Feedback from breakout groups
13:35 - 13:45	Final Remarks

SPEAKERS

DR GEORGE BEARD

Head of New Mobility, TRL

ABSTRACT: Using behavioural insights to increase uptake of electric vehicles in the UK

The transport sector is the single largest contributor to greenhouse gas (GHG) emissions in the UK, accounting for over 27% of all emissions. Of this 27%, passenger cars and light-duty vehicles contribute about 20% of GHG emissions. Reduction of the emissions associated with use of these vehicles is therefore vital to mitigate the negative impacts of climate change and achieve the net zero emissions targets by 2050. There is no silver bullet to solve this problem and multi-pronged attacks are needed, including a) substantial reductions in motor vehicle traffic to shift as many journeys as possible onto more sustainable and less impactful modes, and b) reductions in the emissions resulting from motor vehicle use for the remaining journeys where a viable alternative is not available. Electrification of transport is a key component of this latter objective and large-scale adoption of Electric Vehicles (EVs) currently represents our best solution for decarbonising passenger cars and light-duty vehicles. The UK government has committed to end the sale of new petrol and diesel vehicles in 2030 in order to help drive forward adoption of EVs.

Despite substantial positive growth in the sales of EVs, the representation of EVs in the overall car parc remains low and considerable progress is still required to reach the level of mass-market adoption we need. The relatively low uptake of EVs is due to a number of financial, practical and psychological barriers. So what is being done to address these barriers and what else can we do? What lessons can we apply from behavioural science to accelerate the adoption of EVs? This presentation will summarise the key barriers to adoption of EVs, and a number of behaviour-informed policy measures that aim to address these barriers and harness the right motivations to accelerate adoption of EVs in the UK. The presentation will discuss findings from a recent project for the Department for Transport's (DfT) Social and Behavioural Research Team and the Office for Low Emission Vehicles (OLEV) entitled 'Driving and accelerating the adoption of electric vehicles in the UK'.

Find out more about Dr George Beard and TRL.

SPEAKERS

DR DIMITRIS POTOGLOU

Programme Director of the MSc Transport and Planning, Cardiff University. EPSRC DTE Network+

ABSTRACT: Quantifying of consumer choices for electric vehicles and electric-vehicle-related charging infrastructure

This presentation will provide a brief overview of quantitative research efforts aiming at capturing the driving factors associated with the (potential) demand for electric vehicles (EVs). Primary emphasis will be placed on methods employing survey-based experiments known as stated choice experiments, which through econometric modelling also allow to capture consumer choice heterogeneity and obtain consumers' monetary valuations of EV-specific features (e.g., willingness to pay for improved density/availability of charging infrastructure). The remainder of the presentation will attempt to provide an insight on how such a choice-based analytical framework could be used to study choice regarding EV infrastructure including tariffs, methods of payment, amenities, etc.

Find out more about Dr Dimitris Potoglou.

DR NIKOLAS THOMOPOULOS

Senior Lecturer in Transport, University of Surrey

ABSTRACT: Incorporating the human aspect in the design and development of Electric and Autonomous Vehicles

EVs and AVs have been at the core of transport innovation over the past decade. Industry has been leading the way and governments have been following developments by providing supporting regulations for example. Yet, a missing link to date has been the absence of the human element, namely the user perspective, throughout this ongoing process. This presentation does not focus on user experience design issues, but on acceptability and willingness to use such transport innovations. Selected WISE-ACT and Eurobarometer survey results from a large international survey distributed in more than 20 countries will be presented to pave the way for the subsequent workshop discussions, focusing on behavioural issues, including safety, security and cybersecurity.

Find out more about Dr Nikolas Thomopoulos and WISE-ACT.

DR SOTIRIS MOSCHOYIANNIS
Senior Lecturer in Complex Systems, University of Surrey
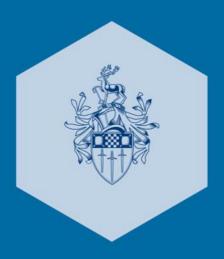
DR SABER FALLAH

Senior Lecturer in Vehicle and Mechatronic Systems, University of Surrey

ABSTRACT: The Contribution of Technology, Connectivity and Data in Adoption of EVs and Electrified Transportation

Despite the huge investment from the UK government on the deployment of EVs, a survey by the society of motor manufacturers and traders (SMMT) has found nearly half of UK buyers still think 2035 too soon to switch to EVs. Range anxiety has been found as one of the biggest factors holding buyers back. This presentation investigates the current EV technologies and the potentials of data and autonomy in addressing this behavioural issue in adoption of EVs and electrified transportation system. Using behavioural insights to increase uptake of electric vehicles in the UK.

Find out more about Dr Sotiris Moschoyiannis and Dr Saber Fallah.

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