



## AI-Enhanced E-Mobility and Electrification of Propulsion Systems for Low-Carbon Transportation Applications

### Abstract

As the world accelerates efforts to decarbonize transportation, the electrification of propulsion systems has become a central strategy for achieving lower emissions and enhancing energy efficiency. Coupled with AI technologies, electrification offers the potential for highly optimized, intelligent transport solutions. This session will focus on how AI and electrification can work together to reduce carbon footprints, improve operational efficiency, and integrate renewable energy sources into transportation infrastructure. This session aims to showcase innovative research and applications that contribute to the sustainable electrification of diverse transportation sectors, including rail, marine, heavy-duty, and light-duty vehicles.

### Special Session Topics

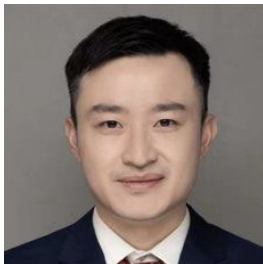
include, but are not limited to:

- Electrification and AI-driven control for hybrid and fuel cell propulsion systems
- Electrification of marine and rail transport with AI support
- Integration of renewable energy in electrified transport systems
- Smart charging infrastructure for electric vehicles
- AI-based predictive maintenance for electrified propulsion systems
- AI in energy storage and battery management for electrified vehicles
- AI for the electrification of transportation infrastructure





## Author Bios and Pics



**Dr. Ji Li** received the Ph.D. degree in mechanical engineering from the University of Birmingham, U.K., in 2020. He is currently an Assistant Professor of control and automation, the Deputy Head of the CASE Automotive Group, and the Manager of the Birmingham CASE Automotive Research and Education Centre, University of Birmingham. His research vision centralizes the critical role of artificial intelligence in shaping the future of automotive technology. Within this framework, the focus covers three key domains: multi-objective control, human-machine interaction, and cyber-physical systems, all oriented toward achieving net-zero and trustworthy engineering solutions. His work has gained international recognition on many occasions, including over 30 journal articles, two book chapters, and three best paper awards at well-known international conferences.



**Prof. Dawei Wu** is Professor of Maritime Energy Systems at the University of Durham and an EPSRC Industry Innovation Fellow. He is a member of the CEE (Clean Energy Engineering) research group and is associated with the CASE (Connectivity, Autonomy, Sharing, and Electrification) Automotive Research and Education Centre. Dr Wu's research strength lies in zero-carbon fuels (such as hydrogen, ammonia, and e-fuels) and zero-emitting propulsion technologies for transport.



**Prof. Jakob Andert** received the Dipl.-Ing. and Dr.-Ing. degrees from RWTH Aachen University, Germany, in 2007 and 2012, respectively. His dissertation focused on control of homogeneous charge compression ignition engines. Since 2014, he has been a Junior Professor for Mechatronic Systems for Combustion Engines with RWTH Aachen University. In 2021, he was appointed Full Professor







for Mechatronics in mobile propulsion. His research interests include electrified propulsion and predictive powertrain controls with a particular focus on the application of Reinforcement Learning methods for complex real-world control tasks



**Prof. Roger** is Professor of Control Systems in the School of Engineering at the University of Birmingham. He is a specialist in applied Control Systems, Mechatronics, Condition Monitoring, Fault Detection and Systems Engineering. Roger has published over 150 research papers and has lead major research activities in Industry and Academia. His team in BCRRE at Birmingham work on research projects that have a strong focus on rail, but also include application to the road, aerospace and energy sectors. Roger's vision is to use his skills and enthusiasm to transform Industrial practice through a combination of world leading research and excellent teaching.



**Dr. Georgios Fontaras** received the Ph.D. degree from the Aristotle University of Thessaloniki. Since 2019, he has been a Visiting Associate Professor with the Department of Mechanical Engineering. He is currently a Research project manager with the Joint Research Center, European Commission, leading the research project low energy and greenhouse emissions neutral transport. His activities focus on EU policy for road vehicle emissions abatement, vehicle and emissions simulation and inventorying, and scientific research for transport decarbonization. He is chairing the ERMES Informal Expert Group on emissions research and co-chairs the expert panel on transport of the UNECE task force for emissions inventories and projections. He has authored or coauthored more than 90 scientific publications in the area.





**Prof. Hongming Xu** received the Ph.D. degree from Imperial College London in 1995. Then, he was a Research Fellow and a Senior Research Fellow with Imperial College London. He moved to Jaguar Cars Ford Premier Automotive Group in 2000, where he was a Project Engineer (2000–2001), a Team Leader (2002–2004), and a Principal Technical Specialist. Then, he joined the University of Birmingham as a Reader of automotive engineering in 2005. He is currently a Professor of energy and automotive engineering with the University of Birmingham, Birmingham, U.K., where he is also the Head of the Vehicle and Engine Technology Research Centre. He has authored or co-authored over 500 journals and conference publications on advanced vehicle powertrain systems. He is a fellow of SAE and IMechE.