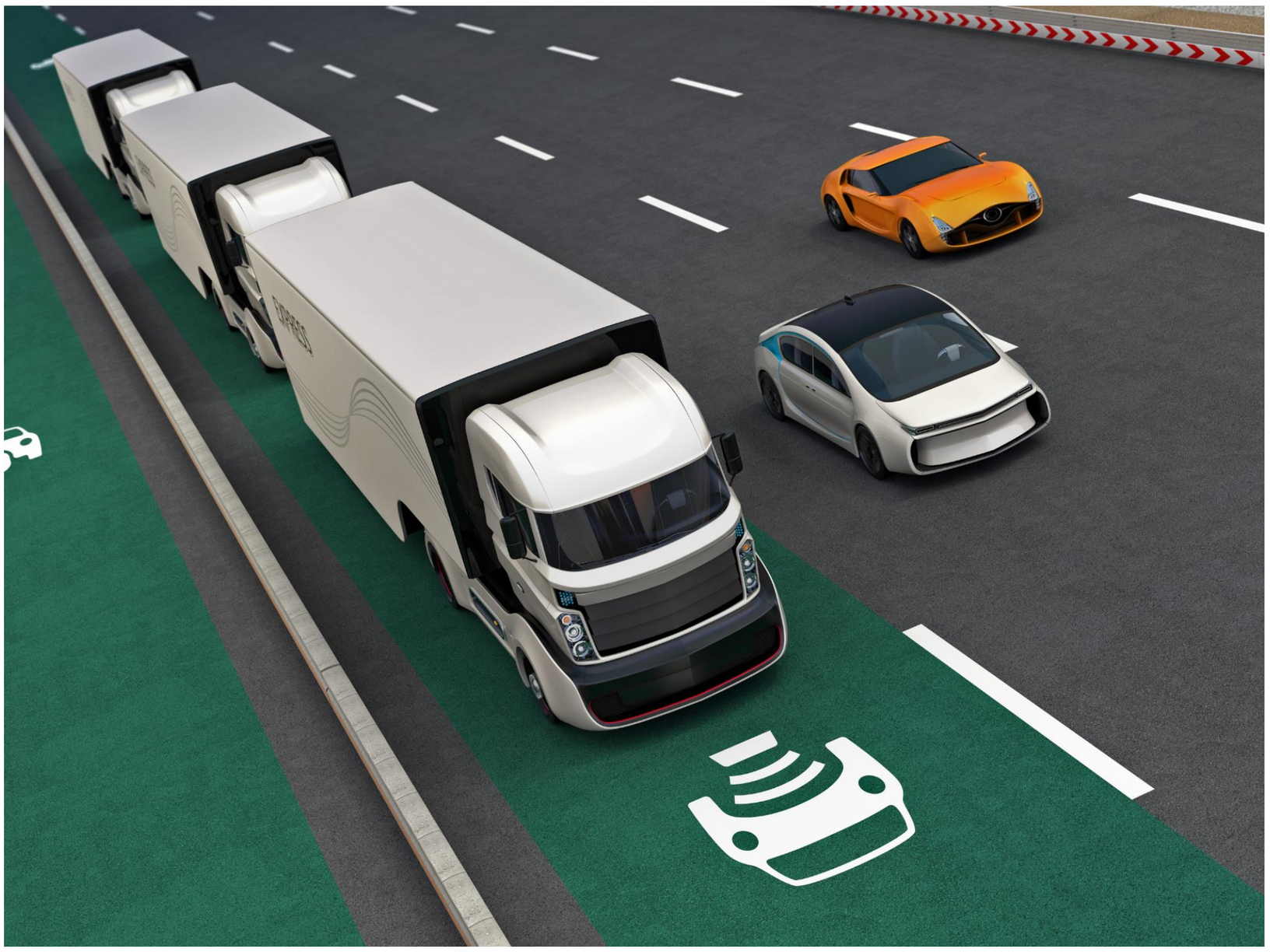
Future Wireless Charging Systems for Transportation

25. 11. 2024 11:00 **Lecture hall T2:C3-337**



Over the past three decades, the researchers at the University of Auckland (UoA) have pioneered and led the global development of many wireless power applications that are becoming commonplace in industry and the home. This work began in the 1990s with roadway and tunnel lighting and monorail systems that with industry partners helped produce revolutionary powered systems in materials handling and clean room industries. Following early successes, new research in the 2000's focused on powering industrial automatic guided vehicles and wireless charging systems for electric vehicles. Solutions were also developed for personal devices such as cell phones, tablets, medical applications etc. Today the UoA researchers continue to lead global efforts, focused on higher power for both stationary charging and dynamic (on the move) power transfer solutions, that need to work together to support the electrification of modern transportation systems.

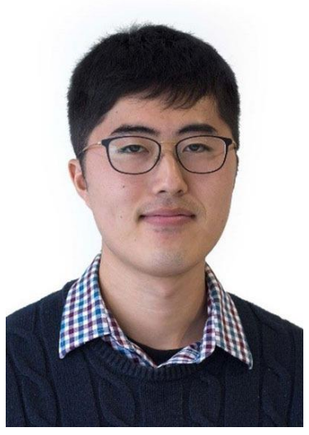
This talk begins by reflecting on the early work and challenges undertaken with various industries that helped pave the way for these solutions. It follows with how UoA researchers are addressing the requirement for cost effective, standardized systems to create a truly electrified interoperable transport fleet. The presentation will then cover existing challenges in magnetic and power class interoperability, as well as bidirectional charging, essential to a sustainable and stable renewable grid followed by challenges in thermal modelling of such systems to ensure longevity and reliability, all of which are critical to an enduring, future-proof system.

Grant a Covic

is a full professor with the Electrical, Computer, and Software Engineering Department at The University of Auckland. He began working on inductive power transfer in the mid 90's, and by early 2000's was jointly leading a team focused on EV charging solutions. He has published more than 200 international refereed papers in this field, worked with over 30 PhDs and filed over 50 patent families, all of which are licensed to various global companies in specialised application fields. He is a co-founder of "HaloIPT," which focused on electric vehicle wireless charging infrastructure. He was a recipient of various awards including New Zealand Prime Minister's Science Prize and IEEE Power Electronics Emerging Technology Award in 2021. He has been a Co-Chair for the IEEE WPTCE conference since 2020.Presently he heads inductive power research at the UoA, is directing a government funded research program on stationary and dynamic wireless charging of EVs within the road, while also co-leading the interoperability sub-team within SAE J2954 wireless charging standard for EVs.

Feiyang Jackman Lin

received the B.E. (Hons.) and Ph.D. degrees in electrical and electronics engineering from The University of Auckland, Auckland, New Zealand, in 2012 and 2017, respectively. He is currently a Senior Lecturer with The University of Auckland, working on the design of heavy duty wireless power systems for stationary and dynamic electric vehicle charging applications. He has also been involved in developing practical solutions for companies, such as WiTricity and Airbus.



Seho Kim

received the B.E. (Hons.) and Ph.D. degrees in electrical and electronics engineering from The University of Auckland, Auckland, New Zealand, in 2012 and 2018 respectively. He is currently working as a Senior Lecturer in the power electronics group with the Department of Electrical, Computer, and Software Engineering, The University of Auckland. His research focuses on the design of inductive power transfer systems for charging electric vehicles.