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Wireless Grid Interfaces For V2X Applications

By

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The penetration rate of Electric vehicles (EVs) into the transport sector is becoming high, as EVs are gaining global acceptance as the means of future transport for sustainable living. Inevitably such high level of penetration will also bring some challenges to the electric power industry. One potential solution of high promise is the vehicle-to-X (V2X) technology that enables EVs to be used as an energy storage to offer services through vehicle-to-home (V2H), vehicle-to-grid (V2G), vehicle-to-building (V2B) and vehicle-to-load (V2L) concepts. For all V2X applications, EVs essentially require a bi-directional power interface either with the electricity network (grid) or load to allow for both storing (charging) and retrieval (discharging) of energy. This can be achieved by both wired and wireless means but the latter, based primarily on Inductive Power Transfer (IPT) technology, is becoming more popular being convenient, safe, and ideal for both stationary and dynamic charging of EVs. The seminar discusses the challenges and future directions of V2X technologies, and presents the latest advances in bi-directional wireless power transfer (BD-WPT) technology developed for V2X applications.

Short biography of Prof. Dr. Udaya K. Madawala



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Udaya K. Madawala graduated with a B.Sc. (Electrical Engineering) (Hons) degree from The University of Moratuwa, Sri Lanka, and received his PhD (Power Electronics) from The University of Auckland, New Zealand as a Commonwealth Doctoral Scholar. At the completion of his PhD, he was employed as a Research and Development Engineer by Fisher & Paykel Ltd,

New Zealand, to develop new technologies for PM motor drives. At present as a Full Professor in the Department of Electrical, Computer & Software Engineering at University of Auckland, New Zealand, he leads a group of researchers focusing on a number of power electronics projects that are related to energy and wireless EV charging systems for V2X applications.

Udaya is a Fellow of the IEEE, and has both industry and research experience in the fields of power electronics and energy. He has served both the IEEE Power Electronics and Industrial Electronics Societies in numerous roles, relating to editorial, advisory, conferences, administrative & technical committees and chapter activities. He was the General Chair of the IEEE Southern Power Electronics Conference (SPEC)- 2016, held in New Zealand, and is also the Chair of SPEC Steering Committee and a Distinguished Lecturer of the IEEE Industrial Electronic Society. He is the recipient of the IEEE PELS Milan M. Jovanović Award for Power Electronics Emerging Technology and the University of Auckland Research Excellence Medal in 2024. Udaya, who has over 300 journal and conference publications, holds a family of global patents related to wireless power transfer (WPT) technology and power converters, and is a consultant to industry.