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## City University Distinguished Lecture Series

Speaker

**Professor Kaushik Rajashekara**

*Distinguished Professor of Engineering  
University of Houston*



# Transportation Electrification-Land and Air: Current Trends and Future Strategies

on

Tuesday, 13 November 2018 at 4:30 pm

at

Connie Fan Multi-media Conference Room  
4/F Cheng Yick-chi Building  
City University of Hong Kong  
Tat Chee Avenue, Kowloon

### Abstract

The aerospace industry is facing challenges similar to those of automotive industry in terms of improving emissions, fuel economy, and cost. Another similarity is the move toward replacing mechanical and pneumatic systems with electrical systems, thus transitioning toward “more electric” architectures and hybrid propulsion systems. To meet these challenges in the automotive industry, significant work has been done in the areas of electric, hybrid, and fuel cell vehicles. In the case of airplanes, more electric architecture and hybrid propulsion is the emerging trend. The intent is to move as many aircraft loads as possible to electrical power, resulting in simpler aircraft systems leading to the potential for lower fuel consumption, reduced emissions, reduced maintenance, and possibly lower costs. Electric-powered environment control systems (ECS), electrical actuators, electric de-icing, etc. are some examples of aircraft systems under consideration. Electric starting of the engine and the conversion of all the pneumatic and hydraulic units on the accessory gearbox (AGB) to an electric system are also being investigated. Another trend in aerospace is industry to move towards hybrid propulsion strategies similar to the propulsion of hybrid vehicles. Recently, there is also an increasing interest in flying cars and vertical take-off and landing vehicles (VTOL) to be used as Air taxis. This presentation examines the current trends in technologies of electric/hybrid vehicles, more electric aircraft, and hybrid electric aircraft. The synergies between the electrical systems for electric/hybrid vehicles, electric and hybrid aircrafts, and flying cars and more electric aircrafts systems are discussed, and future strategies are presented.

### Biography

Professor Kaushik Rajashekara received his Ph.D. degree in electrical engineering from the Indian Institute of Science, Bengaluru, India, in 1984. In 1989, he joined the Delphi Division, General Motors Corporation, Indianapolis, IN, USA, as a Staff Project Engineer. At Delphi and General Motors, he held various lead technical and managerial positions, and was a Technical Fellow and the Chief Scientist for developing electric machines, controllers, battery chargers, and power electronics systems for electric, hybrid, and fuel cell vehicle systems. In 2006, he joined Rolls-Royce Corporation, Indianapolis, USA, as a Chief Technologist for more electric architectures and power conversion/control technologies for more electric and hybrid aircraft systems. In August 2012, he joined as a Distinguished Professor of Engineering at the University of Texas at Dallas, Dallas, TX, USA. Since September 2016, he has been a Distinguished Professor of Engineering with the University of Houston, Houston, TX. He has published more than 160 papers. He is the holder of 35 U.S. and 10 foreign patents. His research interests are in the areas of power electronics, electrification of transportation and renewable-energy systems. Professor Rajashekara is a member of the U.S. National Academy of Engineering and Fellow of the National Academy of Inventors. He is the recipient of the IEEE Richard Harold Kaufmann award for outstanding contributions to the advancement of electrical systems in transportation; IEEE Industry Applications Society Outstanding Achievement Award, and IEEE IAS Gerald Kliman award for contributions to the advancement of power conversion technologies through innovations and their applications to industry. He is a Distinguished Alumnus of Indian Institute of Science, Fellow of IEEE, and a Fellow of SAE International.

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