IEEE Southeastern Michigan Section
Fall 2010 Section Conference
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"Wireless Communications: Foundations and Applications to Ground Transportation and Robotics"

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Abstract:

This presentation is aimed at providing an overview of the wireless communication technology as it relates to ground transportation and robotics. The Foundations section will be developed in three stages. Firstly, it will present the challenges caused by propagation (e.g. multipath, Doppler spread) and interference that can impact the communication budget link. Secondly, it will introduce the related mitigation techniques (wireless channel: models, capacity, modulation, detection, diversity) and their performance measured in terms of signal to noise ratio (SNR) and error probability. The Applications section will discuss topics relating to most recent developments in automotive connectivity and in robotic positioning and remote control. The automotive discussions will be focused on vehicle to infrastructure (V2I) and vehicle to vehicle (V2V) communications with emphasis in regards to the Dedicated Short Range Communication (DSRC) systems. As far as robotics, an example of characterization and modeling of wireless channels for networked robotic systems using WiFi communications. The presentation will conclude on mobile robot positioning for indoor environments. To that end, the positioning performance of three communication systems will be compared. They are the wireless local area networks (WLAN) based system, the wireless sensor network (WSN) system, and the ultrawide band (UWB) system.

Speaker's Biography:

Dr. Heri Rakouth is currently Manager, Technology Exploration at the Innovation and Technology Office (ITO) of Delphi Corp. Troy, Michigan. In this capacity, he coordinates technology innovation activities across three out the five divisions of Delphi. Dr. Rakouth has about 30 years experience in both aerospace/defense telecommunications and automotive electronics industries. He has held various responsibilities at Thomson CSF/Thales and Renault in France as product engineer and technical manager before joining Delphi in 1996. In his most recent assignment, Dr. Rakouth spearheaded cross-divisional efforts that have led to the build of the telematics business development team for the aftermarket and the launch of the V2X proof of concept project recently implemented for the Land Transport Authority of Singapore. In the academic arena, Dr. Rakouth is currently serving as an adjunct faculty at the ECE department of Oakland University teaching Wireless Communications and Power Electronics. He also teaches Mathematics at Davenport University and Mott Community College. He holds a BS-ME-EE from Ecole Spéciale de Mécanique et d' Electricité (ESME) Paris, France, a MS and a PhD degree in Electrical Engineering from the Université of Pierre et Marie Curie (UPMC) of Paris, France along with an MBA from SVSU and MS-Manufacturing Management from Kettering University.

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