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Connected Cars in Future Smart Cities

Abstract

Connected cars will be the next practical step towards the deployment of smart cities. WiFi enabled smart devices will provide the first platform for a field deployment of vehicular applications and protocols. At the beginning safety and navigation applications will open the market. As the deployment will expand new applications will emerge including urban and driver sensing, multimedia entertainment, and on-demand computing. Ultimately cars will become just another element in a large mobile cloud of talking machines. Early applications are likely to use simple vehicle-to-vehicle content dissemination protocols, or one-hop vehicle-to-infrastructure networking. However, multi-hop routing protocols for these vehicular networks will be feasible as the density of devices increases. These networks can be characterized as being highly mobile with frequent partitioning. A major challenge is that many existing routing protocols have difficulty discovering and maintaining routes in such environments. Similarly, current transport level protocols as well as user applications are not designed for such a harsh environment and a partial redesign is necessary to operate in-vehicle. This talk introduces the connected cars' challenges and opportunities in urban areas exploring the current state of the art and best practices.

Biographical Sketch

Giovanni Pau is the ATOS/Renault smart mobility Chair Professor at the University Pierre and Marie Curie, Paris France. He holds the Italian Laura in Computer Science and the PhD in Computer Engineering awarded by the University of Bologna in 1998 and 2002 respectively. Before joining UPMC Dr. Pau was a Senior Research Scientist at the UCLA Computer Science Department where he still retains the position of Adjunct Professor.

Dr. Pau's core research interests are in Network Systems with focus on Vehicular Networks and pervasive mobile sensor systems. He designed and built the UCLA campus vehicular testbed and the UCLA/MPI urban sensing testbed designed to enable hands-on studies on vehicular communications and urban sensing. His research contributions lead to the VERGILIUS and CORNER simulation suites designed to support mobility and propagation modeling in urban environments. More recently, Dr. Pau designed and developed VNDN the Named Data Network (NDN) protocol stack specifically adapted to work on mobile-to-mobile scenarios.

Dr. Pau published more than 80 papers in International Conferences and Archival Journals. While serving at UCLA he contributed to secure more than 3.2 million dollars

in research funds. His work on vehicular networks has been widely cited by the community and reported the general media including BBC Radio, Discovery Channel, The Guardian, Wired, Corriere della Sera, and the Italian National Television to name a few.

Dr. Pau is currently serving as General co-Chair for ACM MobiCom 2015 and ACM MobiSys 2015. He is currently involved as TPC member or TPC Chair in several ACM/IEEE flagship conferences.