

学术报告会

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Integrity-oriented Content Transmission in the Vehicular Ad Hoc Networks

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Abstract:

The effective inter-vehicle transmission of content files, e.g., images, music and video clips, is the basis of media communications in vehicular networks, such as social communications and video sharing. However, due to the presence of diverse node velocities, severe channel fadings and intensive mutual interferences among vehicles, the inter-vehicle or vehicle-to-vehicle (V2V) communications tend to be transient and highly dynamic. Given the initial distance and mobility statistics of vehicles, we develop an analytical framework to evaluate the data volume that can be transmitted upon the short-lived and spotty V2V connection from the source to the destination vehicle. Provided the content file size, we are able to evaluate the likelihood of successful content transmissions through the model. Based upon this analysis, we propose an admission control scheme at the transmitters, that filters the suspicious content transmission requests which are unlikely to be accomplished over the transient inter-vehicle links. Using extensive simulations, we demonstrate the accuracy of the developed analytical model, and the effectiveness of the proposed admission control scheme. In the simulated scenario, with the proposed admission control scheme applied, it is observed that about 30% of the network bandwidth can be saved for effective content transmissions.

Biography:

Dr. Tom Hao Luan received the Ph.D. degree from the University of Waterloo, Canada, in 2012, all in Electrical and Computer Engineering. He was a visiting research scientist in the Institute of Information Engineering, Chinese Academy of Sciences, during March 2013 to August 2013. Dr. Luan will join the Deakin University in Melbourne, Australia, in November, 2013 as a Lecturer in the School of Information Technology. Dr. Luan's research mainly focuses on media streaming and novel service development in the vehicular ad hoc networks, wireless cloud computing, Fog Computing and peer-to-peer networks. He has one US patent granted and authored/coauthored 14 journal papers including IEEE Transaction on Mobile Computing, Multimedia, Vehicular Technology, IEEE Journal on Selected Areas in Communications, and 11 technical papers in conference proceedings, including IEEE/ACM INFOCOM, IEEE/ACM IWQoS, IEEE SECON. Dr. Luan served as a TPC member for IEEE Globecom, ICC, PIMRC and the technical reviewer for multiple IEEE Transactions including TMC, TPDS, TVT, TWC and ITS. He is a steering member of IEEE ComSoc Multimedia Communications Technical Committee (MMTC) Interest Group on Wireless Technology for Multimedia Communications.