



Fall 2022 Colloquium

Department of Computer and Information Sciences

K-Group Random Channel Hopping Rendezvous for Cognitive Radio Networks

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Abstract: Rendezvous is an essential operation for radios in cognitive radio networks. The channel hopping based rendezvous is an important technique for next-generation cognitive radio networks, in which unlicensed users dynamically schedule rendezvous channels using the assigned channel-hopping sequence. In this talk, I will introduce a rendezvous protocol named K-Group Random Channel Hopping (K-RCH) which is based on a symmetric-role model. K-RCH assigns nodes into groups. Each group has at least two nodes, which means the model is more general and can be used in both pairwise and multi-user rendezvous. One of the K-RCH's features is that it uses a multi-round algorithm to increase its efficiency. Another feature is that it adopts a heterogeneous channel availability model to address complicated communication environments. Simulation results demonstrate that K-RCH achieves a much shorter rendezvous time than the current major rendezvous protocols. The maximum time to rendezvous (MTTR) can complete in three time slots, and the expected time to rendezvous (ETTR) decreases with an increasing number of secondary users.



Bio: Min Song is currently a Professor and Chair in the Department of Electrical and Computer Engineering at Stevens Institute of Technology. He also served as Interim Chair for the Computer Science Department at Stevens between February - August 2021. Before joining Stevens, he was the David House Professor and Chair of the Computer Science Department and Professor of Electrical and Computer Engineering at Michigan Tech from 2014 to 2018. He was also the Founding Director of the Michigan Tech Institute of Computing and Cybersystems. Prior to joining Michigan Tech, Min served as an NSF Program Director from 2010 to 2014, where he received the NSF Director's Award. Min's current research interests are in the areas of cognitive radio networks, Internet of Things and cyber-physical systems, mobile computing, wireless communication networks, engineering and computing education. His professional career comprises more than 30 years in academia, government, and industry. Over the course of his career, Min has held various leadership positions and published more than 180 technical papers. Min was the recipient of the NSF CAREER award in 2007. He is an IEEE Fellow.