Abstract: Cooperative communication is becoming a promising technology to increase the channel capacity of wireless networks. The assignment of relay nodes to users plays a critical role to the resulting channel capacity. A significant challenge is how to make the assignment scheme robust to selfish and cheating behavior of users while guaranteeing the social optimal system capacity. Since the nodes in a wireless network are usually owned by individuals, game theory has been used to model the selfish behavior of the nodes in such networks.

In this talk, we will present an integrated optimal relay assignment scheme for cooperative networks. To avoid system performance degradation due to selfish relay selections by the users, we propose a payment mechanism for charging the users to induce them to converge to the optimal assignment. To prevent relay nodes from manipulating the relay assignment by reporting transmission powers untruthfully, we propose a payment mechanism to pay them for providing relaying service.

Bio: Guoliang (Larry) Xue is a Professor of Computer Science and Engineering at Arizona State University. He earned a PhD degree in Computer Science from the University of Minnesota in 1991. His research interests include resource allocation in wireless networks, survivability and security issues in networking, quality of service provisioning, and optimization algorithms for networking problems. He has published over 200 refereed papers in these areas, including over 100 journal papers. He is a recipient of Best Paper Awards at ICC’2011 and MASS’2011, as well as a Best Paper Runner-up at ICNP’2010. He serves on the editorial boards of IEEE/ACM Transactions on Networking, IEEE Transactions on Wireless Communications, and IEEE Network Magazine. He served as a TPC co-chair of IEEE INFOCOM’2010. He is an IEEE Communication Society Distinguished Lecturer for 2010-2011. He is an IEEE Fellow.