

Comp Sci Candidate Talk
Ms. Wei (Lisa) Li
Friday March 4, 2016, in Broome 1756, at 1pm

Self-Collusion Resistant Auctions for Heterogeneous Secondary Spectrum Markets

Abstract:

Spectrum auctions have been proposed as powerful market-based spectrum management techniques in recent years, to improve the channel utilization while benefiting both the primary and the secondary users in secondary spectrum markets. The major design goal of these auction schemes focuses on truthfulness to prevent market manipulation, by ensuring that no buyer/seller can obtain a larger utility via cheating on its bid price. However, self-collusion, a more insidious cheating behavior, can successfully break the truthfulness of the three most popular schemes adopted by secondary spectrum auctions, namely McAfee, Myerson's Optimal Mechanism (MOM), and Vickrey-Clarke-Groves (VCG). Unfortunately, the existence of self-collusion in MOM and VCG has never been reported in literature. In this talk, we mainly talk about our research results in countering the self-collusion problem in MOM and VCG based spectrum auctions. Particularly, we will present the root causes of the self-collusion phenomenon and introduce our novel self-collusion resistant auction schemes that can simultaneously achieve important economic properties, such as truthfulness and individual-rationality. To the best of our knowledge, we are the first to investigate self-collusion in MOM and VCG for secondary spectrum markets.

Bio:

Wei (Lisa) Li is a Ph.D. candidate at the Department of Computer Science, The George Washington University (GWU), with a Ph.D. degree expected in May 2016. Her current research interest spans the areas of secure and privacy-aware computing, and secure and truthful auctions in dynamic spectrum access. She has completed more than 20 authored/coauthored papers, and most of them were published or accepted for publication in premier journals and conferences such as IEEE/ACM Transactions on Networking, IEEE JSAC, IEEE Transactions on Wireless Communications, ACM MobiHoc, and IEEE INFOCOM. She is the winner of two best student paper awards with one from ACM Workshop CRAB'2013 and one from WASA'2010. She also received Louis P. Wegman Endowment Fellowship in 2014, and School of Engineering and Applied Science 125th Anniversary Endowment Fellowship in 2013 from GWU. Besides, she is a student member of IEEE and a member of IEEE Communications Society.