Application of Game Theory for Designing Cognitive Radio Networks

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Presenters: Dr. Ekram Hossain, University of Manitoba, Canada
Dr. Zhu Han, University of Houston, USA

Abstract: Game theory provides a rich set of mathematical tools to model and analyze cognitive radio systems where the cognitive radio entities have to make decisions on dynamic spectrum access which have possibly conflicting consequences. An intensive (but friendly) introduction to the various game theory models, their fundamental concepts and properties, and their applications in designing dynamic spectrum access protocols for CRNs will be provided. Game theory models for power control, bandwidth allocation/sharing and routing will be illustrated. Important game models from microeconomic theory as well as the theory of auctions, which can be used for spectrum management and pricing in CRNs, will be presented.

Authors:
Hossain, Ekram
Han, Zhu