

# Game Theory for Multiple Access and Resource Allocation in Wireless Networks

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## Game Theory for Multiple Access and Resource Allocation in Wireless Networks

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The tutorial will provide a crash course on the different techniques for game theoretic modeling of the multiple access problem in wireless systems and the state-of-the-art research on this topic. An intensive (but friendly) introduction to the various game theory models (e.g., noncooperative/cooperative, static/dynamic, and complete/incomplete information games), their fundamental concepts and properties, and their applications in designing multiple access and resource allocation methods in wireless networks will be presented. Time-division multiple access (TDMA), frequency-division multiple access (FDMA), and code-division multiple access (CDMA), ALOHA, and carrier sense multiple access (CSMA)-based wireless networks will be given. Also, game models for the multiple access schemes in dynamic spectrum access-based cognitive radio networks will be presented.

**Biographies:**

Ekram Hossain is currently a Full Professor in the Department of Electrical and Computer Engineering at University of Manitoba, Winnipeg, Canada. His current research interests include

resource allocation and medium access control in wireless networks, cooperative and cognitive wireless systems, and wireless sensor networks. Dr. Hossain serves as the Area Editor for the IEEE Transactions on Wireless Communications, an Editor for the IEEE Transactions on Mobile Computing, the IEEE Communications Surveys and Tutorials, and IEEE Wireless Communications. He presented tutorials on in IEEE ICC'10, IEEE ICC'09, IEEE VTC'08-Fall, IEEE Globecom'07, IEEE WCNC'07. Dr. Hossain is a registered Professional Engineer (P.Eng.) in the province of Manitoba, Canada.

Dusit Niyato is currently an Assistant Professor in the Division of Computer Communications, School of Computer Engineering, Nanyang Technological University, Singapore. His current research interests include design, analysis, and optimization of wireless communications and vehicular networks for intelligent transportation systems (ITS) applications. He has published over 80 research articles in leading Journal and Conferences related to protocol design and radio resource management in mobile communication systems. Dr. Niyato serves as an Editor for the IEEE Transactions on Wireless Communications, the Wireless Communications and Mobile Computing (WCMC) Journal (Wiley), and the KICS/IEEE Journal of Communications and Networks (JCN). He served as a co-chair of the Symposium on "Next Generation Mobile Networks" in the International Wireless Communications and Mobile Computing Conference (IWCMC'09) and IWCMC'10.

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