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12:00 – 1:00 PM
Mechanical Engineering Room 1163

Game Theory Network Models for Disaster Relief

Presented by:

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The number of disasters is growing as well as the number of people affected by them with 2017 being the most costly year for the US in terms of natural disasters. In this presentation, I will describe our research on the development of game theory network models for disaster relief that integrate financial flows from donors as well as the logistics associated with relief item deliveries. Both Generalized Nash Equilibrium as well as Nash Equilibrium constructs will be given and the associated methodologies for the formulation, analysis, and computation to the models outlined. Case studies on Hurricane Katrina as well as the tornadoes that hit western Massachusetts in 2011 will be presented, which provide surprising insights of relevance to policymakers.

ABOUT THE SPEAKER: Anna Nagurney is the John F. Smith Memorial Professor at the Isenberg School of Management at UMass Amherst and the Director of the Virtual Center for Supernetworks, which she founded in 2001. She holds ScB, AB, ScM and PhD degrees from Brown University and is the author of 13 books, more than 185 refereed journal articles, and more than 50 book chapters. She serves on the editorial boards of a dozen journals and two book series and is the editor of another book series. She has been a Fulbrighter twice (in Austria and Italy), was a Visiting Professor at the School of Business, Economics and Law at the University of Gothenburg in Sweden and was a Distinguished Guest Visiting Professor at the Royal Institute of Technology (KTH) in Stockholm. She was a Visiting Fellow at All Souls College at Oxford University during the 2016 Trinity Term and a Summer Fellow at the Radcliffe Institute for Advanced Study at Harvard in 2017. She has been recognized for her research on networks with the Kempe prize from the University of Umea, the Faculty Award for Women from the US National Science Foundation, the University Medal from the University of Catania in Italy, and was elected a Fellow of the RSAI (Regional Science Association International) as well as INFORMS among other awards. She has been recognized with several awards for her mentorship of students and her female leadership with the WORMS Award, for example. Her research has garnered support from the AT&T Foundation, the Rockefeller Foundation through its Bellagio Center programs, the Institute for International Education, and NSF. She has given plenary/keynote talks and tutorials on 5 continents and is an active member of INFORMS, POMS, and RSAI. Her research focuses on network systems from transportation and logistical ones, including supply chains, to financial, economic, social networks and their integration, along with the Internet. She studies and models complex behaviors on networks with a goal toward providing frameworks and tools for understanding their structure, performance, and resilience and has contributed to the understanding of the Braess paradox in transportation networks and the Internet. She has also been researching sustainability and quality issues with applications ranging from pharmaceutical and blood supply chains to perishable food products and fast fashion to humanitarian logistics. She has advanced methodological tools used in game theory, network theory, equilibrium analysis, and dynamical systems. She was a Co-PI on a multi-university NSF grant with UMass Amherst as the lead: Network Innovation Through Choice, which was part of the Future Internet Architecture (FIA) program and is presently a Co-PI on an NSF EAGER grant.