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Viterbi-led Initiative in Game Theory and Human Behavior Crosses Multiple Disciplinary Lines

Holding their first symposium on Friday 4/20, the group promises 'to put USC in a unique position to tackle key challenges of the 21st century'

April 06, 2012 — The emerging field of Game Theory and Human Behavior (GTHB) is bringing faculty from almost every USC school and research center together in a new group. And will bring outstanding experts to USC April 20.

Milind Tambe: His prizewinning GTHB systems are now at work protecting airports

GTHB practice overlaps mathematics, psychology, politics, economics, military strategy, communication, law and business, software engineering, artificial intelligence, wireless communication and even philosophy. It builds on the mathematical theory of games invented by the multifaceted genius John von Neumann and further developed by John Forbes Nash, whose extraordinary career was the subject of the book and film "A Curious Mind."

Game theory is now in wide use helping to guide human decisions and activity. And it fits perfectly into the USC culture of interdisciplinary inquiry, leading to the recent creation of a USC GTHB group under the leadership of Viterbi School Professor Milind Tambe.

Three faculty members have been working especially closely with him: Provost Professor of Business, Law and Political Economy Mathew McCubbins, Provost Professor of Psychology and Business Wendy Wood and Associate Professor Richard John of the Dornsife College Psychology Department. More than 50 other USC faculty are also participating.

At the upcoming USC Game Theory & Human Behavior Symposium, seven distinguished experts in the field from as many institutions will gather in Mudd Hall to talk about advances and projects. The symposium is the latest event in what has been a busy schedule since the GTHB kickoff in fall, 2010.

Tambe's own work using game theory to devise strategies to make the best and most effective use of limited law enforcement resources in a given geographical area is now in regular use in many airports. It has drawn international attention and a number of prizes, including most recently the Columbus Foundation 2010 Homeland Security Award for Border and Transportation Security, The research was supported by USC National Center for Risk and Economic Analysis of Terrorism Events (CREATE), which is also participating in GTHB.

"Our effort," reads the GTHB mission statement, "is to create a campus-wide collaborative environment to realize the Game Theory and Human Behavior potential to fuse the mathematics and formal approaches of the former with the wealth of social science insights of the latter to create new and necessary approaches for 21st century issues."

The mathematics of trust and betrayal. Two accomplices who can't communicate must make individual decisions that affect the other as well as themselves. Mathematical analysis of this "prisoners' dilemma" problem was the starting point for what has become a critical discipline in numerous fields.

Other USC GTHB participants also span a subject range unique even in USC's interdisciplinary environment. The include the Annenberg School of Communication and Journalism, the Dornsife College of Letters, Arts and Sciences, the Gould School of Law, the Keck School of Medicine, the Marshall School of Business, the School of Architecture, the School of Cinematic Arts and the Sol Price School of Policy, Planning and Development.

The Institute for Creative Technologies, Center for Sustainable Cities, Center for Megacities, Center for Energy Informatics, and the Schaeffer Center for Health Economics and Policy are also involved. "The GTHB effort promises to put USC in a unique position to tackle key challenges of the 21st century," says Tambe.

The National Academy of Engineering Grand Challenges, which the USC Viterbi School has vigorously taken up since their announcement, include a number of areas directly addressed by GTHB, including preventing nuclear terror, advancing personalized learning, securing cyberspace and renewing urban infrastructure.

"All involve multiple decision-makers in game-theoretic and human behavior settings, thus requiring the fusion of mathematical, engineering and social sciences to make significant progress in addressing these challenges," notes the GTHB mission statement.

GTHB held many seminars in 2011, has already held three this year, and plans more.

"And we are hoping one day to have a PhD degree in GTHB," said Tambe