Computing Game-Theoretic Solutions for Security

Professor Vincent Conitzer
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School of Physical and Mathematical Sciences

Algorithms for computing game-theoretic solutions are now deployed in real-world security domains, including air travel and harbors. These applications raise some hard questions. How do we deal with the equilibrium selection problem? How is the temporal and informational structure of the game best modeled? What assumptions can we reasonably make about the utility functions of the attacker and the defender? And, last but not least, can we make all these modeling decisions in a way that allows us to scale to realistic instances? I will present our ongoing work on answering these questions. This is joint work with Dmytro Korzhyk, Joshua Letchford, Sayan Bhattacharya, Ronald Parr, Kamesh Munagala (Duke); Manish Jain, Zhengyu Yin, Milind Tambe (USC); Christopher Kiekintveld (UT El Paso); Ondrej Vanek, Michal Pechoucek (Czech Technical University); Liam MacDermed, Charles Isbell (Georgia Tech); Tuomas Sandholm (CMU)

Speaker Biography

Vincent Conitzer is the Sally Dalton Robinson Professor of Computer Science and Professor of Economics at Duke University. He received Ph.D. (2006) and M.S. (2003) degrees in Computer Science from Carnegie Mellon University, and an A.B. (2001) degree in Applied Mathematics from Harvard University. His research focuses on computational aspects of microeconomics, in particular game theory, mechanism design, voting/social choice, and auctions. This work uses techniques from, and includes applications to, artificial intelligence and multiagent systems. Conitzer has received a Presidential Early Career Award for Scientists and Engineers (PECASE), the IJCAI Computers and Thought Award, recognition as one of "AI's Ten to Watch" by IEEE Intelligent Systems, an NSF CAREER award, a Sloan fellowship, the inaugural Victor Lesser dissertation award, an honorable mention for the ACM dissertation award, and several awards for papers and service at the AAAI and AAMAS conferences. Conitzer and Preston McAfee are the founding Editors-in-Chief of the ACM Transactions on Economics and Computation (TEAC).

Host: Assistant Professor Edith Elkind, Division of Mathematical Sciences, School of Physical and Mathematical Sciences