UCF | Electrical and Computer Engineering

Spring 2018 Seminar Series

Incentive Design for Collective Decision Making

MONDAY APRIL 2, 2018

1:00 PM – HEC 450

Incentivizing desired behavior is a problem of fundamental importance in multi-agent systems and real-world scenarios. This problem exhibits a multitude of conceptual and technical challenges. In this talk, I will focus on three of these:

1. Team formation
2. Decentralized coordination
3. Matching donor and patients for kidney transplants

First, I will present the case of partition of players into teams, where the focus is on maintaining incentives to honestly reveal preferences while achieving a series of desirable properties, such as efficiency and equity. This is done using a novel mechanism that aside from maintaining stability, is also Pareto efficient and individually rational, and has remarkably good empirical incentive and equity properties. Next, I will move to a setting in which individuals (human subjects) situated on a network aims to achieve global consensus on a decision using only local information. Decentralized coordination on networks is highly susceptible to adversarial manipulation even when very few adversaries are present. It turns out that adding "trusted" nodes is only marginally helpful, and, surprisingly, can be harmful. Interestingly, the ability to communicate saves the day and improves the network's resilience against adversarial behavior. One of the significant contributions in this work is a set of computational behavioral models, learned from the data collected in the experiments. These models allow a data-driven agent-based modeling analysis that simulates human behavior offline in the same manner as software agents. The last part of my talk is dedicated to cases in which transplant centers holds tuples of donors and patients for a kidney transplant. Given the severe shortage of kidneys and the current reality in which centers are acting only to benefit themselves, I present a dynamic mechanism that incentivizes collaboration, dramatically increases the number of transplants and circumvents a known impossibility result about the possibility to result in more than ½-fraction of efficient allocation.

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Chen Hajaj is a post-doctoral researcher and data science fellow at the Vanderbilt University's Department of Computer Science and Electrical Engineering. He received his Ph.D. degree in Computer Science, M.Sc degree in Electrical Engineering and a B.Sc. degree in Computer Engineering from Bar-Ilan University. His work focuses on game theoretic modeling of modern markets, algorithmic and behavioral game theory, incentive design, crowdsourcing, and electronic commerce. Chen won several awards in Israel and abroad among which is the Prof. Rahamimoff Travel Grant for Young Scientists by the United States-Israel Binational Science Foundation (BSF).