Spokane Regional Mathematics Colloquium

Presents: Predrag Tosic, Assistant Professor, Whitworth University

On Individual Rationality, Social Welfare, and Complex Strategic Interactions:
Understanding the Competitive-Cooperative Spectrum

We are interested in complex strategic interactions between rational, self-interested agents, where those interactions provide implicit incentives to the agents to cooperate with each other. We model such interactions as 2-player strategic games that are "far from zero-sum". It has been observed for such games, from the now classical work on (Iterated) Prisoner's Dilemma in the 1980s to much more recent analyses of (Iterated) Traveler's Dilemma, the Centipede Game and a few other formal 2-player strategic games, that the classical game theory based on solution concepts such as Nash Equilibria fails to capture what would both intuitively and based on experiments with actual human subjects appear to be "rational behavior". Alternative concepts of "acting rationally" in such scenarios have been proposed in recent years, including the concept of "Regret Minimization" (Halpern and Pass, 2009). It has been argued, that regret minimization is a more adequate solution concept for such strategic interaction.

We study an interesting 2-player game, Generalized (Iterated) Traveler's Dilemma, and analyze which strategies tend to do well in it, as a function of key parameters (the range of allowable bids, the bonus value and the minimum bid increment value). We are interested in finding, for which parameter choices various type of strategies do well, and against what types of opponents. We undertake this analysis in the context of a (simulated) round-robin tournament involving a number of strategies previously studied in the context of Iterated Traveler's Dilemma (ITD), as well as a handful of regret minimization based strategies. Our simulated tournament and analysis of its results not only provide new insights into the challenging game of ITD itself, but also shed more light on what could be (more) appropriate notions of "individual rationality" in strategic interactions that are "far from zero-sum" as an alternative to the well-known concepts from classical game theory.

WHERE: GONZAGA UNIVERSITY | HERAK 237

WHEN: WEDNESDAY, APRIL 3, 2019, 5PM-6PM

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