Game Theory

SYSC 452/552,   Spring 2024

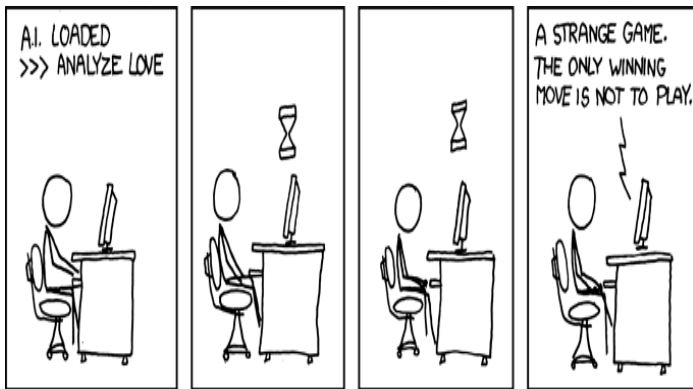**Professor:** J. J. P. Veerman
Class meets: M-W 16:40 - 18:30
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Main Text: S. Schecter, H. Gintis. Game Theory in Action: An Introduction to Classical and Evolutionary Models. Princeton University Press, 2016.

Supplementary Text: P.D. Straffin. Game Theory and Strategy. Number v. 36 in Anneli Lax New Mathematical Library. Mathematical Association of America, 1993

General Description: In this course, students are introduced to fundamentals of game theory as well as its applications. In essence, game theory studies rational decision making in an environment where decisions affect others. In this course we will explain how quantitative methods can be used to analyze social decisions and their effects.

Decisions in social context have a substantial influence on our lives. For instance, the decision by many to take the bus to work or to buy a car (and pollute more), has considerable impact on our lives. The same can be said of posturing by leaders in international politics. Game theory also plays a very important role in, for example, economics and evolutionary biology.

The concepts necessary to translate real life situations to basic game theory are trees and matrices. Once these concepts and their rules are understood, we can ask what the best strategy is to optimize the outcome, or, put differently, what is the best play? For certain classes of games, one can answer this question.

Prerequisites: There are no formal prerequisites. The student is expected to have a very good grasp of high school mathematics, and a willingness to learn some more mathematical concepts as we go.

Grading: Your course grade will be based on class participation (25%), homework (25%), and exams (50%).