

CMSC 474, Introduction to Game Theory

1. Introduction

Mohammad T. Hajiaghayi
University of Maryland

What is Game Theory?

- Game Theory is about interactions among self-interested agents (players)
- Different agents have different preferences (i.e. like some outcomes more than others)
- Goals of this course:
 - Formal definitions and technicality
 - Better understanding of real-world games

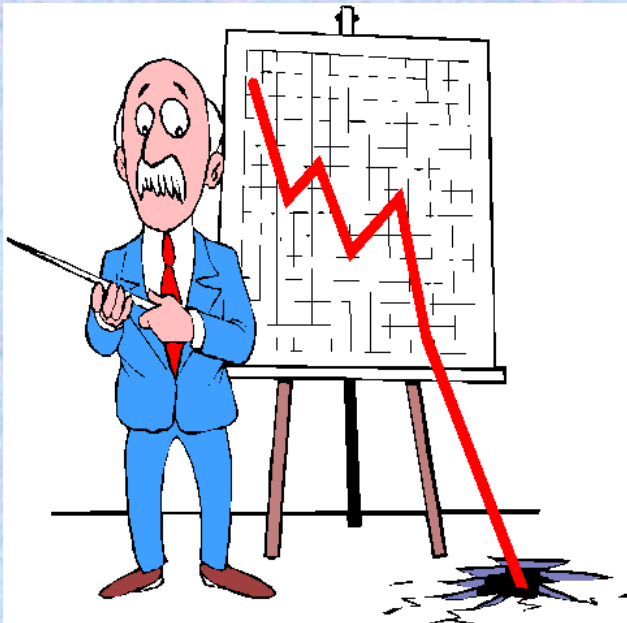


Algorithmic Game Theory

- Algorithm Game Theory is often viewed as “incentive-aware algorithm design”
- Algorithm design often deals with dumb objects though Algorithmic Game Theory often deals with smart (self-interested) objects
- Combines Algorithm Design and Game Theory
- Also known as Mechanism Design
- We may touch the subject but not covered in this course
- A graduate course on it will be presented next semester

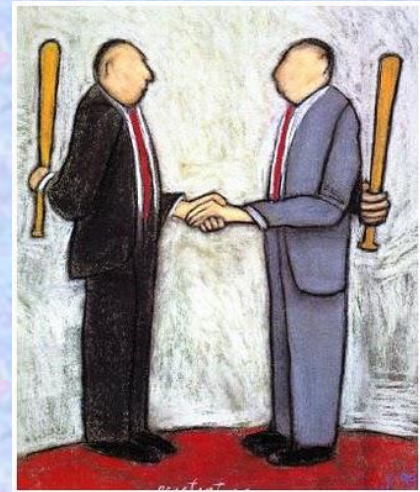
Some Fields where Game Theory is Used

- Economics, business
 - Markets, auctions
 - Economic predictions
 - Bargaining, fair division



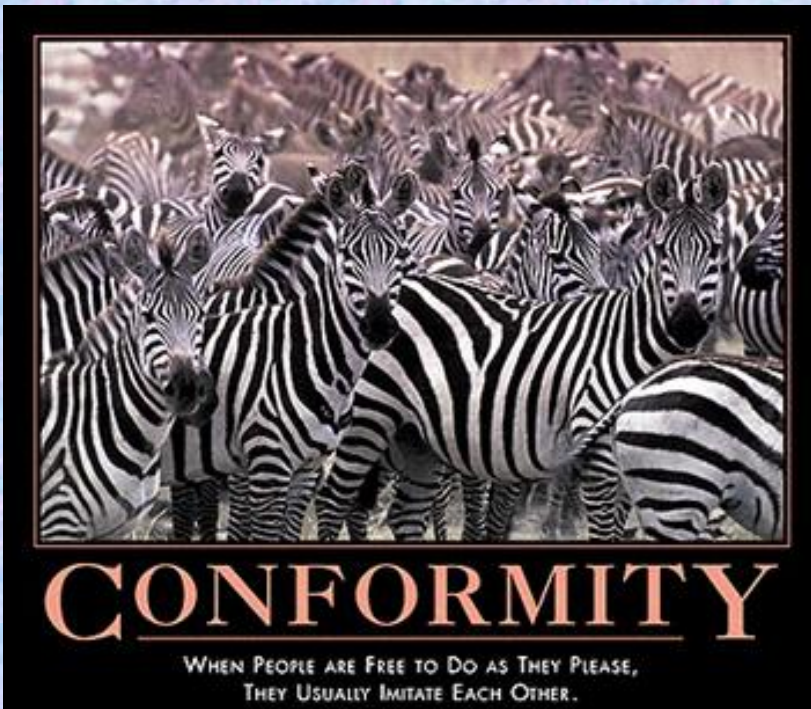
Some Fields where Game Theory is Used

- Government, politics, military
 - Negotiations
 - Voting systems
 - International relations
 - War
 - ...



Some Fields where Game Theory is Used

- Biology, psychology, sociology
 - Population ratios, territoriality
 - Social behavior
 - ...



Some Fields where Game Theory is Used

- Engineering, computer science
 - Game programs
 - Computer and communication networks
 - Road networks
 - ...

