Game Theory and Computational Social Choice

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Artificial Intelligence

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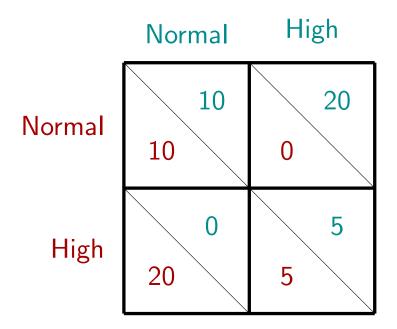
Multiagent Systems

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Economic Paradigms

Game Theory

Game theory is the study of mathematical models for the analysis of strategic interactions between rational agents. Example:

	Normal	High
Normal	10 \ 10	20 \ 0
High	0 \ 20	5 \ 5

Keywords: strategic games, mechanism design, coalitional games

Computational Social Choice

Social choice theory is concerned with the design and analysis of methods for collective decision making. <u>Example</u>:

> *2 Germans:*   Beer $\succ$ Wine $\succ$ Milk
>
> *3 Frenchmen:*   Wine $\succ$ Beer $\succ$ Milk
>
> *4 Dutchmen:*   Milk $\succ$ Beer $\succ$ Wine

<u>Keywords</u>: voting theory, fair allocation, judgment aggregation

Course Characteristics

- *Commonalities*

  - Analysis and discussion of formal models of real-world concepts
  - Lots of problem solving, mathematical maturity expected
  - Little or no programming required

- *Game Theory*

  - Focus on textbook material in mathematical economics
  - Assessment by homework

- *Computational Social Choice*

  - Focus on current research, topics change every year
  - Assessment: homework + group research project (paper/talk)