TU Clausthal

Diplomanden- und Doktorandenseminar
des Instituts für Informatik

Game representations and their complexity

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Game theory provides models for the interaction of agents or players in order to predict their behaviour. As one can see with this years nobel prize laureates in economics, Shapley and Roth, game theory is an important topic and applied fruitfully in economical sciences. Nash, one of the nobel prize laureates in 1994, first defined the Nash equilibrium, which is a combination of the strategies of players, such that no single agent wants to change its strategy. While a Nash equilibrium is guaranteed to exist for mixed strategies, deciding the existence of a pure strategy Nash equilibrium is an interesting question.

This talk will focus on the complexity theoretic aspects of pure Nash equilibria and refinements of it: The Pareto and the strong Nash equilibrium The classic representation of strategic games, the standard normal form, also known as matrix form, is very extensive since all utilities are represented as their explicit values. I will explore forms which represent games more succinct. These forms have approximately the same expressiveness but smaller representations: The general form and the implicit form. Both forms rely on Turing machines to calculate the utilities. I then analyse and compare the representations in their complexity features for decision problems of the existence and verification of Nash equilibria and the refinements.

Dienstag, den 06.11.2012
13 Uhr s.t. in Raum 106, IfI, Julius-Albert-Straße 4

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