Approaches to Multi Agent Systems

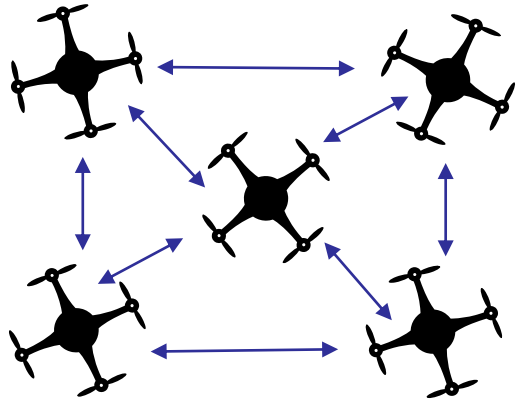
TECHNISCHE UNIVERSITÄT DARMSTADT

Proseminar

A multi agent system is a system of multiple units interacting with each other to collectively solve a complex problem. Applications are for example the communication between traffic lights to control the traffic in cities or to ensure stability of a power grid despite disturbances. Multi agent systems can also be used for environmental monitoring and for efficient agriculture.

Given the wide range of applications, multi agent systems are interesting for various research disciplines. Consequently, there are diverse approaches how multi agent systems are represented and treated in research. For example, methodologies are derived based on reinforcement learning, game theory or control theory. The goal of this Proseminar is to give an overview and present these different approaches.

The report must be written in English. Meetings during the work can be in English or German.



Requirements:

- Control theory and machine learning is beneficial
- Basic knowledge in graph theory is beneficial

Tasks:

- Literature review on different approaches to multi agent systems
- Evaluate, compare and present the results

Resources:

[1] J. Lunze: Networked Control of Multi-Agent Systems.
[2] J. Hu: Robust Formation Coordination of Robot Swarms With Nonlinear Dynamics and Unknown Disturbances: Design and Experiments
[3] Y. Shoham, K. Leyton-Brown: Multiagent Systems Algorithmic, Game-Theoretic, and Logical Foundations

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