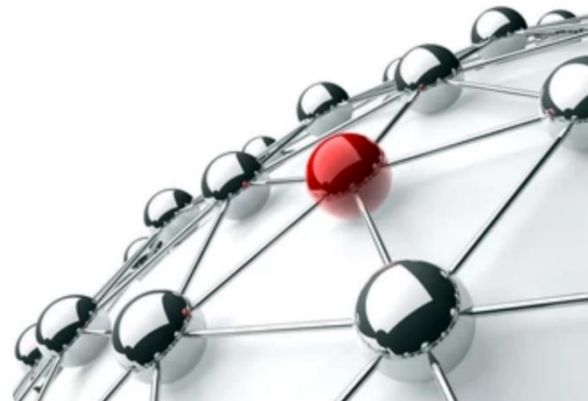**Announcement for Bachelor Thesis**
Control of Multi-Agent Systems by Linear Controller Synthesis

Motivation

The control of multi-agent systems provides an interesting aspect to cope with large, networked systems and can be used for example in the formation control of robots and multi-rotors, vehicle platooning, or synchronization of oscillator networks. Different methods exist to design controllers for linear systems which consider different specific features of distributed systems. The challenging aspect, in this case, is that the underlying structure, such as physical couplings or the communication graph of the distributed system, must be considered during the design to guarantee certain beneficial properties of the controller. Particularly, in view of the fact that more and

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more systems communicate with each other and work together to fulfill a common goal, distributed control represents an effective solution in this area.

Task description

In this thesis, different methods of controller synthesis for distributed linear systems are to be investigated. To this end, an extensive literature review of existing methods for the design of controllers for multi-agent systems is to be performed and various control design methods are to be presented in a compact fashion. Then, based on the results of the literature review a controller shall be designed for a distributed control problem, for example, the synchronization of a multi-agent system, and compared with the results of an existing distributed control method based on model predictive control.

Requirements

Knowledge of linear controller design (for example by attending Regelungstechnik A/B) and proficiency in MATLAB programming. Basic knowledge of model predictive control is advantageous.

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