Universität Stuttgart
Institut für Systemtheorie und Regelungstechnik
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Open Thesis (MA)

Distributed MPC for coordination - of systems with conflicting objectives

Description:

In a recent work, we developed a distributed model predictive control (DMPC) scheme for multi-agent systems with conflicting objectives. An agent is a system that can act individually in an environment. A multi-agent system consists of a number of agents that are connected in some other way, e.g. collision avoidance or a common goal. Many control goals are characterised by cooperation of the agents, for example, converging to a certain formation or agreeing on some value, i.e. consensus. We consider multi-objective systems with conflicting interests, i.e. each agent has an individual self-interest (characterised by a local economic stage cost) but a common asymptotic cooperative goal should be achieved. The proposed scheme uses an economic MPC formulation together with average constraints to comply with both goals. In this thesis, we would like to extend the scheme to nonlinear systems using different techniques.

cf. P. N. Köhler et al. (2016), *A distributed economic MPC scheme for coordination of self-interested systems*, CDC 2016

Prerequisites:

- *Model Predictive Control*
- interest in distributed systems

Supervisor:

Matthias Köhler
Room 3.240

Area:

Model predictive control

Properties:

Type: **MA**

20% literature
50% theory
30% simulation

Beginning:

anytime

Further information on www.ist.uni-stuttgart.de/lehre/bama

Aushang vom November 8, 2022