Universität Stuttgart
Institut für Systemtheorie und Regelungstechnik
Prof. Dr.–Ing. Frank Allgöwer

Open Thesis (MA)

Online learning in model predictive control

Description:

Decision making in hindsight has been studied extensively in the machine learning community, especially within the areas of online optimization. In this setting, at each time, a decision maker is making a decision on its current state in order to optimize a cost function that is only available at hindsight, i.e., is only revealed after the decision is made; for this reason, the chosen state does not necessarily correspond to the optimizer of the objective function. Remarkably in most MPC schemes, the decision on the control sequence for the time horizon is made before knowing the objective func- tion in future horizons, similar to the online optimization settings. Moreover, in MPC it is assumed that the models are perfectly known, which is usually not the case in practice, and hence the decision on the choice of control sequence is made at hindsight for that reason as well. The project aims at exploring the connection between these two topics..

Prerequisites:

- Optimal Control
- If you are interested, please feel free to email: bahman.gharesifard@queensu.ca or ce@ist.uni-stuttgart.de

Supervisor:

B. Gharesifard and C. Ebenbauer
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Area:

model predictive control, online optimization, learning theory

Properties:

Type: MA

20% literature
40% theory
40% simulation

Beginning:

Fall 2020

Weitere Informationen: www.ist.uni-stuttgart.de/lehre/bama