



Einladung zum Oberseminar Wissenschaftliches Rechnen

Julius-Maximilians-Universität Würzburg
Lehrstuhl für Wissenschaftliches Rechnen IX

Prof. Martin Gugat

FAU Erlangen-Nürnberg, Department Mathematik
Lehrstuhl für Dynamics, Control, Machine Learning and Numerics
(Alexander von Humboldt-Professur)

L^1 -control cost and the finite-time turnpike property

The finite-time turnpike property is an extreme form of the turnpike property where the optimal state reaches a desired steady state after finite time. This steady state is in turn a solution of a static optimal control problem corresponding to the initial dynamic optimal control problem on a finite time interval $[0, T]$.

This extreme situation can occur if the control cost is given by a non-smooth norm, for example with an L^1 -norm control cost. Moreover, to enforce the convergence to a steady state, a tracking term should be a part of the objective functional. The situation is clearly related to exact penalization, which is only possible with non-smooth penalty term.

We show that even if the tracking term is differentiable, the non-smooth control cost can lead to a finite-time turnpike phenomenon. A strictly convex tracking term has the advantage that it can enforce uniqueness of the optimal control.

We also discuss the approximation of the non-smooth control cost by smoothing kernels. The theory shows that the finite-time turnpike property is lost. But with increasing smoothing parameter, it is approximated, which is illustrated in numerical results.

Ort: Raum 30.02.003 (Mathematik West, 2.Stock)

Zeit: Mittwoch, 07.02.2024, 12:00Uhr

Zu diesem Vortrag laden wir Sie herzlich ein.
You are cordially invited to this lecture.

gez. Prof. Dr. Alfio Borzi
gez. Prof. Dr. Frank Werner