Bernoullis Tafelrunde

Graduate Student Seminar

Thursday, 7 December 2017, 12:15-13:00
Seminarraum 05.002, Spiegelgasse 5

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Sparse grids in optimal control

Abstract

The mathematical theory of optimal control covers the problem of determining optimal control strategies for a given system. From the mathematical viewpoint we can talk about minimizing functionals subject to some constraints, e.g. a PDE model of the system. In the first part of this presentation I will give a brief introduction to the optimal control of PDEs using the linear quadratic control of heat equation as an example. In particular we will talk about the feedback optimal control. In general it is not possible to provide an analytic solution for optimal control problems. This motivates the development of appropriate numerical methods. In particular we are interested in high dimensional approximation schemes as the computation of the feedback optimal control is usually a problem with double dimensionality of the underlying PDE. Thus, in the second part of the talk I will concentrate on sparse grids as a numerical technique which allows to deal with high dimensional problems to a certain degree.