

30.5.2013

Im Schwerpunktkolloquium
Analysis und Numerik

wird am

Donnerstag

Dienstag, dem 6. Juni 2013
folgender Vortrag gehalten:

**Optimal Control Problems subject to Differential-Algebraic
Equations**

Herr Prof. Dr. Matthias Gerds

Fakultät für Luft- und Raumfahrttechnik, Universität der Bundeswehr München

Abstract: The talk provides an overview on solution approaches for optimal control problems subject to differential-algebraic equations (DAEs) and control and state constraints. Such problems typically occur in the context of mechanical multibody systems, process engineering, simulation of electric circuits, inverse dynamics, or discretizations of certain partial differential equations like Navier-Stokes equations.

The first part of the talk summarizes first order necessary optimality conditions in terms of local and global minimum principles. The local minimum principle is derived by considering the DAE optimal control problem in suitable Banach spaces and exploiting first order necessary optimality conditions of Fritz-John type.

Globalized semismooth Newton methods are applied to solve the necessary optimality conditions numerically.

Alternatively, direct shooting techniques and extensions towards the treatment of DAEs are discussed. Such methods transform the optimal control problem into a nonlinear program, which can be solved by suitable optimization methods like SQP methods.

Finally, numerical results for selected applications from virtual test-driving, pro-active active chassis control, and rendezvous and docking maneuvers will be presented.

Zeit: 17:00 Uhr

Raum: F 426

Interessenten sind herzlich willkommen!

gez. Stefan Volkwein