Institut für Systemtheorie und Regelungstechnik

Distributed Model Predictive Control and Moving Horizon Estimation

Short course announcement

Description:

This short course is intended to introduce those interested in model predictive control (MPC) to the following two research areas: (i) distributed MPC and (ii) moving horizon estimation.

After a short introduction overviewing fundamental concepts and establishing notation, the following material is presented.

Distributed MPC.
The topics to be covered include:

1. distributed MPC and its relationship to suboptimal MPC
2. stability properties of distributed MPC
3. inherent robustness of distributed MPC
4. proposal for nonlinear, distributed MPC

Moving horizon estimation.
The topics to be covered include:

1. state estimation as an optimization problem: full information estimation
2. duality between estimation and regulation
3. stability properties of full information estimation
4. moving horizon estimation with zero prior weighting
5. moving horizon estimation with nonzero prior weighting

Dates:

Monday, June 20 to Wednesday, June 22, 2011
exact times will be posted on the website:
http://www.ist.uni-stuttgart.de/education/courses/MPC

Place:

IST-Seminar-Room 3.243 · Pfaffenwaldring 9 · Campus Stuttgart-Vaihingen

Prerequisites:

Basic knowledge in control and in particular MPC

Lecturer:

Prof. James B. Rawlings
Department of Chemical and Biological Engineering
University of Wisconsin, Madison, WI

Biographical Information:

James B. Rawlings received the B.S. from the University of Texas in 1979 and the Ph.D. from the University of Wisconsin in 1985, both in Chemical Engineering. He spent one year at the University of Stuttgart as a NATO postdoctoral fellow and then joined the faculty at the University of Texas. He moved to the University of Wisconsin in 1995 and is currently the Paul A. Elfers Professor of Chemical and Biological Engineering and the co-director of the Texas-Wisconsin-California Control Consortium (TWCCC).

His research interests are in the areas of chemical process modeling, molecular-scale chemical reaction engineering, monitoring and control, nonlinear model predictive control and moving horizon state estimation.

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