Predictive Control Beyond Regulation

By

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Abstract

During the last decade significant advancements in the field of predictive control, especially with respect to system theoretical properties such as stability and real-time solution have been made. In the first part of this talk we outline some of these achievements, focusing on stability and the efficient solution of predictive control problems. In the second part we present recent results related to issues beyond stabilization with a special focus on network controlled systems, decentralized control, robust predictive control, and tracking. The results will be underlined considering examples from robotics, mechatronics and chemical engineering.

Bio

Rolf Findeisen is the head of the systems theory and automatic control laboratory at the Otto-von-Guericke-University Magdeburg Germany. He studied Engineering Cybernetics at the University of Stuttgart (Diploma 97), Chemical Engineering at the University of Wisconsin-Madison (M.Sc. ’97), and Information Technology at the ETH Zürich-Switzerland. In ’04 he obtained a Dr.-Ing. from the University of Stuttgart. Since ’07 he is Professor at the Otto-von-Guericke Universität Magdeburg. He hold several visiting positions, including MIT Cambridge, EPLF Lausanne, NTNU Norway and Imperial College London. He is a member of the board of governors of the state funded excellence initiative Complex Dynamical Systems, of the International Max-Planck Research Graduate School, and of the Otto-von-Guericke Graduate School. He will be the IPC CoChair of the IFAC World Congress in Berlin in 2020. The main research interests of his research group are the development and application of systematic, theoretically well-founded analysis and control methods for complex systems. Main areas of interest are the development and application of optimization base control and estimation schemes, especially predictive control approaches, system theoretic methods for problems from systems biology and biotechnology, especially for unraveling, modeling, and interactions, experimental design, and intervention/therapy design, as well as model validation, experimental design, and parameter estimation methods for nonlinear systems.

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