



Optimal Control of Membrane Diafiltration Processes

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Abstract: Membrane processes stand for an emerging technology in chemical and bioprocess industry used both in production and down-stream processing. They receive growing attention mainly due to reduced energy demands and higher efficiency of the achieved separation or processing goals. These systems, however, did not receive much attention from process optimization community and that is why they provide many opportunities. The lecture will discuss the existing industrial operation and control of membrane diafiltration systems. Optimal control theory will be employed to improve the existing state of control and to propose new control strategies. Process uncertainty will be handled using set-membership estimation techniques. Simulation and experimental case studies will demonstrate the advantages of the proposed approach.

Bio: Dr Radoslav Paulen currently works at the Institute of Information Engineering, Automation and Mathematics at Slovak University of Technology in Bratislava. He does research in Modelling, Parameter Estimation, Optimization and Advanced Control of Dynamic Systems. The group of Dr Paulen concentrates on research in estimation and optimal control of nonlinear dynamic systems with applications in chemical and biochemical processes. The main research topics include (i) guaranteed and statistical parameter estimation, and (ii) dynamic optimization, global optimization, predictive control.