ALPEN-ADRIA UNIVERSITÄT KLAGENFURT

Invitation to the Doctoral Seminar

Prof. Dr. Lars Grüne
University of Bayreuth

"Can neural networks solve high dimensional optimal feedback control problems?"

N.2.35 | Wednesday, 30 April 2025 | 10:00 a.m.

Abstract
Deep Reinforcement Learning has established itself as a standard method for solving nonlinear optimal feedback control problems. In this method, the optimal value function (and in some variants also the optimal feedback law) is stored using a deep neural network. Hence, the applicability of this approach to high-dimensional problems crucially relies on the network's ability to store a high-dimensional function. It is known that for general high-dimensional functions, neural networks suffer from the same exponential growth of the number of coefficients as traditional grid based methods, the so-called curse of dimensionality. In this talk, we use methods from distributed optimal control to describe optimal control problems in which this problem does not occur.

Barbara Kaltenbacher and the Department of Mathematics look forward to seeing you at the talk!