

Prof. Serkan Gugercin
Department of Mathematics Virginia Tech
Blacksburg ,USA

Optimal Model Reduction by Interpolation

Abstract

In this talk, we investigate the problem of optimal model reduction of large-scale linear dynamical systems using interpolation. First, we present a trust-region approach for optimal H_2 model reduction of multiple-input/multiple-output linear dynamical systems. The approach generates a sequence of reduced order models producing monotone improving H_2 error norms and is globally convergent to a reduced order model guaranteed to satisfy first-order optimality conditions with respect to H_2 error criteria. Then, we look at the optimal model reduction in the context of parameterized systems where the state-space quantities are parameter dependent. We will provide a systematic approach built on interpolatory H_2 optimal model reduction methods that will produce parameterized reduced-order models having high fidelity throughout a parameter range of interest. Then, for systems with parameters in the input/output maps, we present how to obtain reduced-order models that are optimal with respect to an $H_2 \otimes L_2$ joint error measure.