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Interpolatory Conditions for L_2-optimal Reduced-order Modeling

In the recent work, we studied a structured L_2-optimal reduced-order modeling problem, derived gradients of the squared L_2 error, and proposed a gradient-based optimization algorithm for finding (locally) optimal reduced-order models. In this talk, we show how we can recover known interpolatory necessary optimality conditions, such as the ones for H_2-optimal model order reduction of linear time-invariant systems. Furthermore, we develop new interpolatory conditions for certain structured linear time-invariant systems and for a class of stationary parametric problems. Finally, the theoretical results are demonstrated on a few numerical examples.

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