Near-optimal frequency-weighted interpolatory model reduction

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Abstract

In this talk, we discuss interpolatory methods for frequency-weighted model reduction. We give a general introduction into model reduction methods for linear control systems. A particular emphasis lies on the construction of reduced models minimizing the $\mathcal{H}_2$ error. For the unweighted case, we review existing optimality conditions and associated numerical methods. We show that these concepts can be extended to the frequency-weighted case. The corresponding first-order optimality conditions will lead to Hermite type (tangential) interpolation conditions for a specific rational function $\mathfrak{F}$. We discuss a possible numerical treatment and show its use for the controller reduction problem.