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Interpolatory H-infinity Model Reduction

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We introduce an interpolation framework for H-infinity model reduction founded on ideas originating in optimal-H2 interpolatory model reduction, realization theory, and complex Chebyshev approximation. By employing a Loewner "data-driven" framework within each optimization cycle, large-scale H-infinity norm calculations can be completely avoided. Thus, we are able to formulate a method that remains effective in large-scale settings with the main cost dominated by sparse linear solves. Several numerical examples illustrate that our approach will produce high fidelity reduced models consistently exhibiting better H-infinity performance than those produced by balanced truncation; these models often are as good as (and occasionally better than) those models produced by optimal Hankel norm approximation. In all cases, these reduced models are produced at far lower cost than is possible either with balanced truncation or optimal Hankel norm approximation.

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