Balanced Truncation Method for Unstable Linear-time-invariant Systems

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Abstract: We propose a new balanced truncation method for reducing unstable LTI systems. The new method is based on the idea of shifting matrix A to stable region, for which two Lyapunov equations for controllability and observability Gramians can be solved. We also discuss about generalized bilinear mapping that links our method to discrete LTI systems. Numerical results are illustrated to show the good performance of our method and to compare to several existent methods.

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