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Almost almost-equitableness and clustering-based error bounds
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Clustering is a recent approach for model order reduction of network systems. It boasts the preservation of many qualitative properties: network structure, positivity, sparsity, consensus, and synchronization. A partition of the vertices in the underlying graph is used to define a reduced order model. Almost equitable partitions are of particular interest, due to their connection to the controllability of the network system. For a class of multi-agent systems, Monshizadeh et al. developed a simple expression for the $\mathcal{H}_2$-error when an almost equitable partition is used. In this talk, we first present the corresponding $\mathcal{H}_\infty$-error expression. Second, we show an extension to arbitrary partitions, providing general $\mathcal{H}_2$- and $\mathcal{H}_\infty$-error bounds.

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