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An introduction to Extended Formulations - capturing the expressive power of LPs and SDPs

Linear and semidefinite programming are two core optimization paradigms with many important applications in mathematics, engineering, and business. However, the expressive power of these modeling paradigms is only partially understood so far and extended formulations are a powerful and natural tool to analyze the possibilities and limitations of linear and semidefinite programming formulations.

In this talk I will provide an overview of recent breakthrough results in extended formulations, both in the linear and the semidefinite setting, and lay out a reduction frameworks for establishing upper and lower bounds for the size of exact and approximate LP and SDP formulations. This framework allows for surprisingly simple and convenient analyzes without relying on any heavy machinery.