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Random methods for the analysis of quadratic constraint sets

We review a framework for the analysis of sets of constraints, with no explicit assumptions, and we show the connection between minimal representations, irreducible infeasible systems, minimal infeasibility sets, as well as other attributes of the preprocessing of mathematical programs.

We show how the framework facilitates the development of a probabilistic preprocessing algorithm for a variety of mathematical programs, and we apply it specifically to convex quadratic constraint sets. We show, by example, that the method is surprisingly effective in finding feasible solutions.

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