Interval arithmetic and copositivity detection

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Abstract

Interval arithmetic is a valuable tool in numerical analysis and global optimization. Interval arithmetic operates with intervals defined by two real numbers and produces intervals containing all possible results of corresponding real operations with real numbers from each interval. Interval methods for global optimization detect subregions where there are no better values of objective function than a know value, where the objective function is monotone, etc. Detection of copositivity is important in combinatorial and quadratic optimization. Several proposed algorithms for copositivity detection use simplicial partitions. However, interval arithmetic is not directly applicable in the case of simplicial subregions. In this talk we investigate possibility to use interval arithmetic in detection of copositivity.