Computational Mathematics Seminar Series

The Multi-Objective Polynomial Optimization

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Postdoctoral Scholar

Zoom Zoom
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Abstract:

ZOOM:

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The multi-objective optimization is to optimize several objective functions over a common feasible set. Since the objectives usually do not share a common optimizer, people often consider (weakly) Pareto points. This paper studies multi-objective optimization problems that are given by polynomial functions. First, we study the convex geometry for (weakly) Pareto values and give a convex representation for them. Linear scalarization problems (LSPs) and Chebyshev scalarization problems (CSPs) are typical approaches for getting (weakly) Pareto points. For LSPs, we show how to use tight relaxations to solve them, how to detect existence or nonexistence of proper weights. For CSPs, we show how to solve them by moment relaxations. Moreover, we show how to check if a given point is a (weakly) Pareto point or not and how to detect existence or nonexistence of (weakly) Pareto points. We also study how to detect unboundedness of polynomial optimization, which is used to detect nonexistence of proper weights or (weakly) Pareto points.

Speaker's Bio:

Zi Yang is a postdoctoral scholar in the Electrical & Computer Engineering Department at UC Santa Barbara. His current research includes optimization, tensor computation, and their applications in machine learning and data science. Prior to joining UCSB, he obtained Ph.D. in mathematics from UC San Diego, where he conducted research in polynomial and tensor optimization.

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