

*Department of Mathematics,
University of California San Diego*

Math 278B - Mathematics of Information, Data, and Signals Seminar

Joel Tropp
Caltech

Scalable semidefinite programming

Abstract:

Semidefinite programming (SDP) is a powerful framework from convex optimization that has striking potential for data science applications. This talk describes a provably correct randomized algorithm for solving large, weakly constrained SDP problems by economizing on the storage and arithmetic costs. Numerical evidence shows that the method is effective for a range of applications, including relaxations of MaxCut, abstract phase retrieval, and quadratic assignment problems. Running on a laptop equivalent, the algorithm can handle SDP instances where the matrix variable has over 10^{14} entries.

This talk will highlight the ideas behind the algorithm in a streamlined setting. The insights include a careful problem formulation, design of a bespoke optimization method, and use of randomized matrix computations.

Joint work with Alp Yurtsever, Olivier Fercoq, Madeleine Udell, and Volkan Cevher. Based on arXiv 1912.02949 (Scalable SDP, SIMODS 2021) and other papers (SketchyCGM in AISTATS 2017, Nyström sketch in NeurIPS 2017).

Host: Rayan Saab

Thursday, September 23, 2021

11:30 AM

Zoom link:

**<https://msu.zoom.us/j/96421373881>
(passcode: first prime number > 100)**
