EnCORE Workshop on Computational vs Statistical Gaps in Learning and Optimization

## February 26 - March 1, 2024

Scientific Overview

In this workshop, we will explore the statistical and computational requirements for solving various learning problems. The statistical limit is the minimum number of samples needed to solve a learning problem. In contrast, the computational limit is the minimum number of samples required for the problem to be solvable by an efficient algorithm. There is much research on the statistical requirements for many important learning problems, but the computational requirements are less well-understood. We often have large gaps between the two for several important problems (e.g., sparse linear regression). In addition, there are also gaps in our understanding of the costs of various constraints on learning, such as privacy, fairness, interpretability, robustness, and parallelization. This workshop will provide a forum to discuss the latest research and develop new ideas on the above questions. It will help build bridges between different disciplines, such as applied mathematics, statistics, optimization, and theoretical computer science, which will lead to more effective solutions to challenges in statistical inference.

This workshop will include a poster session; a request for posters will be sent to registered participants in advance of the workshop.

Participation

Additional information about this workshop including links to register and to apply for funding, can be found on the webpage listed below. Encouraging the careers of women and minority mathematicians and scientists is an important component of IPAM's mission, and we welcome their applications.
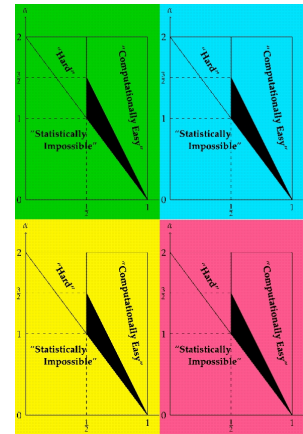
Organizers

Arya Mazumdar (University of California, San Diego)
Raghu Meka (University of California, Los Angeles)
Rachel Ward (University of Texas at Austin)

Speakers

Abhineet Agarwal (University of California, Berkeley), **Sitan Chen** (Harvard University), **Jelena Diakonikolas** (University of Wisconsin-Madison), **Surbhi Goel** (University of Pennsylvania), **Wasim Huleihel** (Tel Aviv University), **Adel Javanmard** (University of Southern California), **Stefanie Jegelka** (Massachusetts Institute of Technology), **Pravesh Kothari** (Princeton University), **Ravi Kumar** (Google Inc.), **Pasin Manurangasi** (Google Thailand), **Arya Mazumdar** (University of California, San Diego), **Raghu Meka** (University of California, Los Angeles), **Ankur Moitra** (Massachusetts Institute of Technology), **Andrea Montanari** (Stanford University), **Jelani Nelson** (University of California, Berkeley), **Omer Reingold** (Stanford University), **Cynthia Rush** (Columbia University), **Vatsal Sharan** (University of Southern California), **Matus Telgarsky** (University of Illinois at Urbana-Champaign), **Rachel Ward** (University of Texas at Austin)