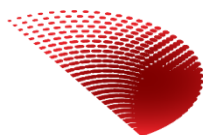




THE UNIVERSITY OF
CHICAGO

THE COMMITTEE ON
COMPUTATIONAL AND
APPLIED MATHEMATICS



THE UNIVERSITY OF CHICAGO
**DATA SCIENCE
INSTITUTE**

CAM & DSI JOINT COLLOQUIUM

RACHEL WARD

Oden Institute for Computational Engineering & Sciences,
Department of Mathematics,
The University of Texas at Austin

Gradient Descent for Low-Rank Matrix Factorization

THURSDAY, May 11th, at 4:00 PM

Jones 303, 5747 S. Ellis Ave. Chicago, IL 60637

ABSTRACT

A standard result in optimization theory says that for a loss function which is uniformly smooth and strongly convex (or satisfies a 'PL-inequality'), gradient descent converges linearly to a global minimizer. Unfortunately, this theory is too limited to explain the practical effectiveness of gradient descent in finding global minimizers of nonconvex optimization problems arising in machine learning. The smoothness and PL-inequality assumptions even fail to hold for simple nonconvex prototype problems such as low-rank matrix factorization, highlighting the need to enlarge the scope of the theory for gradient descent. In this talk, we take a step towards this goal, providing simple and improved linear convergence results for (alternating) gradient descent applied to low-rank matrix factorization. If time permits, we will discuss further results on implicit bias of gradient descent towards low-complexity solutions in the overparameterized regime.

Organizers:

Jeremy Hoskins, Department of Statistics (CAMI), jeremyhoskins@statistics.uchicago.edu & Yuehaw Khoo, Department of Statistics (CAMI), ykhoo@galton.uchicago.edu

CAM Colloquium URL: <https://cam.uchicago.edu/events/cam-colloquium/>

If you wish to subscribe to our email list, please visit the following website:

https://lists.uchicago.edu/web/subscribe/cam_colloquium/.