THE UNIVERSITY  OF HONG KONG

Institute of Mathematical Research
Department of Mathematics

Mathematics for Machine Learning Seminar

Certifying optimality in nonconvex robust PCA

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Abstract

Robust principal component analysis seeks to recover a low-rank matrix from fully observed data with sparse corruptions. A scalable approach fits a low-rank factorization by minimizing the sum of entrywise absolute residuals, leading to a nonsmooth and nonconvex objective. Under standard incoherence conditions and a random model for the corruption support, we study factorizations of the ground-truth rank-r matrix with both factors of rank r. With high probability, every such factorization is a Clarke critical point. We also characterize the local geometry: when the factorization rank equals r, these solutions are sharp local minima; when it exceeds r, they are strict saddle points.

Date:	April 16, 2026 (Thursday)
Time:	3:00 pm – 4:00 pm
Venue:	Room 210, Run Run Shaw Building HKU

All are welcome