

## **A Preconditioned Riemannian Gradient Descent Algorithm for Low-Rank Matrix Recovery**

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Low-rank matrix recovery problem frequently arises in signal processing, machine learning, and imaging science. Riemannian gradient descent (RGD) algorithm is one of the most efficient algorithms to solve it. In this talk, we introduce a preconditioned Riemannian gradient descent (PRGD) for low-rank matrix recovery, where the preconditioner is simple and easy to compute. We establish the theoretical recovery guarantee of PRGD under the assumption of the restricted isometry property. Our experiments show that PRGD is capable of accelerating RGD by up to ten times in solving low-rank matrix recovery problems such as matrix completion.