

Critical points of quadratic low-rank optimization problems

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The absence of spurious local minima in certain non-convex minimization problems, e.g. in the context of recovery problems in compressed sensing, has recently triggered much interest due to its important implications on the global convergence of non-convex optimization algorithms. One example is low-rank matrix sensing under rank restricted isometry properties. It can be formulated as a minimization problem for a quadratic cost function constrained to a low-rank matrix manifold, with a positive semidefinite Hessian acting like a perturbation of identity on cones of low-rank matrices. We present an approach to show strict saddle point properties and absence of spurious local minima for such problems under improved conditions on the restricted isometry constants. This is joint work with André Uschmajew (MPI Leipzig).

Presenter: Prof. VANDEREYCKEN, Bart (University of Geneva)