Title: Low-rank optimization: from differential geometry to recommender systems

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The central topic of this talk is low-rank optimization, where the archetypal problem consists of minimizing a real-valued function defined on a set of matrices of fixed or bounded rank. The fact that the set of fixed-rank matrices admits Riemannian manifold structures endows the problem with a rich geometry. We will see how geometric concepts can be exploited to design efficient low-rank optimization methods, and we will show how low-rank optimization applies to recommender systems. This talk is based on joint work with Nicolas Boumal.