

SVD approximations for large scale imaging problems

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Abstract

A fundamental tool for analyzing and solving ill-posed inverse problems is the singular value decomposition (SVD). However, in imaging applications the matrices are often too large to be able to efficiently compute the SVD. In this talk we present a general approach to describe how an approximate SVD can be used to efficiently compute approximate solutions for large-scale ill-posed problems, which can then be used either as an initial guess in a nonlinear iterative scheme, or as a preconditioner for linear iterative methods. We show more specifically how to efficiently compute the an SVD approximation for certain applications in image processing.