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Robust tensor completion using transformed tensor singular value decomposition. (English)
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Summary: In this article, we study robust tensor completion by using transformed tensor singular value decomposition (SVD), which employs unitary transform matrices instead of discrete Fourier transform matrix that is used in the traditional tensor SVD. The main motivation is that a lower tubal rank tensor can be obtained by using other unitary transform matrices than that by using discrete Fourier transform matrix. This would be more effective for robust tensor completion. Experimental results for hyperspectral, video and face datasets have shown that the recovery performance for the robust tensor completion problem by using transformed tensor SVD is better in peak signal-to-noise ratio than that by using Fourier transform and other robust tensor completion methods.

MSC:
15A04 Linear transformations, semilinear transformations
65F99 Numerical linear algebra
90C25 Convex programming

Keywords:
low-rank; robust tensor completion; sparsity; transformed tensor singular value decomposition; unitary transform matrix

Full Text: DOI

References:
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