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Fast adaptive PARAFAC decomposition algorithm with linear complexity

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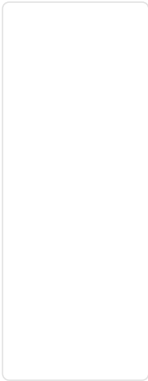
We present a fast adaptive PARAFAC decomposition algorithm with low computational complexity. The proposed algorithm generalizes the Orthonormal Projection Approximation Subspace Tracking (OPAST) approach for tracking a class of third-order tensors which have one dimension growing with time. It has linear complexity, good convergence rate and good estimation accuracy. To deal with large-scale problems, a parallel implementation can be applied to reduce both computational complexity and storage. We illustrate the effectiveness of our algorithm in comparison with the state-of-the-art algorithms through simulation experiments.

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