COMPUTING A LOW-RANK APPROXIMATION OF A TENSOR

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Keywords: tensor, low-rank, approximation, multilinear, Newton's method, Grassmann, manifold

Abstract

We investigate various properties of the best rank-(r_1, r_2, r_3) approximation of a tensor, and their implications in the development of algorithms for computing the approximation. The problem is formulated as an optimization problem on a product of Grassmann manifolds, which we solve by Newton's method. We develop a notation that makes it possible to derive the Newton equation without extensive index manipulation (which is rather common in tensor contexts). Numerical examples are given, where we compare the Newton method with the alternating least squares method.

This is joint work with Berkant Savas.