**Nonnegative Matrices in Machine Learning**

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## Abstract

Recently, machine learning algorithms have been developed that incorporate matrices with nonnegativity constraints. Unsupervised learning algorithms with nonnegative matrices for approximate matrix decompositions have been used to learn features in high dimensional data. Additionally, supervised learning algorithms based upon support vector machines use nonnegative matrices to efficiently learn nonlinear classifers. Applications of these techniques to problems in vision and information retrieval will also be presented.