

GAMM Workshop on Computational and Mathematical Methods in Data Science (COMinDS)



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Type: **Talk**

Nonnegative Matrix Factorization: Introduction, Identifiability and Computation

Friday, 4 November 2022 09:00 (1 hour)

Given a nonnegative matrix X and a factorization rank r , nonnegative matrix factorization (NMF) approximates the matrix X as the product of a nonnegative matrix W with r columns and a nonnegative matrix H with r rows. NMF has become a standard linear dimensionality reduction technique in data mining and machine learning. In this talk, we first introduce NMF and show how it can be used in various applications, including image feature extraction and document classification. Then, we address the issue of non-uniqueness of NMF decompositions, also known as the identifiability issue, which is crucial in many applications. We finally discuss how the factors (W,H) can be computed. We illustrate these results in applications coming from hyperspectral imaging and analytical chemistry.

This is joint work with Maryam Abdolali and Robert Rajko.

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