
Matrix completion cases in spectral analysis & synthesis

Cédric Févotte*¹

¹Laboratoire Lagrange – Centre National de la Recherche Scientifique - CNRS – France

Abstract

Data is often available in matrix form, in which columns are samples and rows are features, and matrix factorizations are a popular topic of machine learning and signal processing. They are in particular at the heart of modern matrix completion techniques, in which the assumption of a latent low-rank structure is used to predict missing entries in the data. Popular applications are collaborative filtering (e.g., movie prediction from ratings) and inpainting (e.g., reconstruction of missing or corrupted pixels in images).

Besides, matrix factorizations, and more particularly non-negative matrix factorizations (NMF), are commonly used to analyze/unmix spectral data, e.g., in signal processing or hyper-spectral imaging. In this talk I will present two useful applications of matrix completion in these setting, for model selection (choosing a right measure of fit using held-out entries in hyper-spectral cubes) and bandwidth extension (synthesis of missing frequency content in audio signal processing).

*Speaker