Non-negative matrix factorization with Gaussian process priors

We present a general method for including prior knowledge in a nonnegative matrix factorization (NMF), based on
Gaussian process priors. We assume that the nonnegative factors in the NMF are linked by a
strictly increasing function to an underlying Gaussian process specified
by its covariance function. This allows us to find NMF decompositions
that agree with our prior knowledge of the distribution of the factors, such
as sparseness, smoothness, and symmetries. The method is demonstrated
with an example from chemical shift brain imaging.

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