Non-Negative Matrix Factorization

Meets Time-Inhomogeneous Markov Chains

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Non-negative matrix factorization 101

A standard NMF [3] is represented as the following optimization problem:

\[ \min_{W,H} F(W,H) = \|X - WH\|^2 \]

Commonly optimized using multiplicative update rules (MURs):

\[ W^{(t+1)} = \frac{XH^T}{\text{vec}(XH^TW^TWX)} \]

\[ H^{(t+1)} = \frac{X^TW}{\text{vec}(X^THW^TWX)} \]

\[ \text{or} \quad W^{(t+1)} = \frac{XH^T}{\text{vec}(XH^TW^TWX)} \]

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