
STOCHASTIC NEIGHBOR EMBEDDING ALGORITHMS FOR DIMENSIONALITY REDUCTION

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ABSTRACT

Dimensionality reduction techniques are essential for the effective visualization and analysis of high-dimensional data. This study focuses on Stochastic Neighbor Embedding (SNE) and its variant, t-distributed Stochastic Neighbor Embedding (t-SNE) algorithms. These methods transform distances between observations into probability distributions using specific functions, while gradient descent is employed to minimize the Kullback-Leibler (KL) divergence between high-dimensional and low-dimensional representations. The principles behind these algorithms are explained, and their advantages and limitations are discussed.

Keywords Stochastic Neighbor Embedding (SNE) · t-Distributed Stochastic Neighbor Embedding (t-SNE) · Dimensionality Reduction · Gradient Descent · Kullback-Leibler Divergence

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