

## Denoising Autoencoder Self-Organizing Map

The Denoising Autoencoder Self-Organizing Map (DASOM) is a combined machine learning method of dimensionality reduction, feature extraction, and clustering[1]. Deep learning techniques show significant promise in improving the results of various clustering unsupervised learning algorithms, however unsupervised learning requires extremely large data sets in order to obtain accurate results.

The application of this (and many other) machine learning architectures to large data sets requires the use of high performance computing. This scales with the depth of the Denoising Autoencoder and size of the Self-Organizing Map. Whilst the fusion of these two methods is complicated, there exists significant portions of the architecture that can be parallelized.

Combining OpenMP and MPI, the DASOM algorithm should be able to produce useful results on both shared and distributed memory systems.

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