

Thresholded Wavelet Representation

A transformation of the data $D^* = XW$ is performed for a **known** matrix W . The data is only used to learn the K most important coefficients to keep as our latent features X^* .

Autoencoder Representation

The encoder is a very general (possibly non-linear) function of the data: $X^* = f_K(X)$. We assume that it can be represented using a neural network with multiple hidden layers but do not assume parametric structure (e.g., linearity).

Representation
Fixed a-priori

Representation
Learned from
the Data

Principal Components Analysis (PCA)

We find the orthogonal projection matrix Φ such that our latent representation is given by $X^* = X\Phi$. We assume the linear structure of the transformation but learn the projection matrix Φ .

*Less Reliance
on Data*

*Greater
Flexibility*