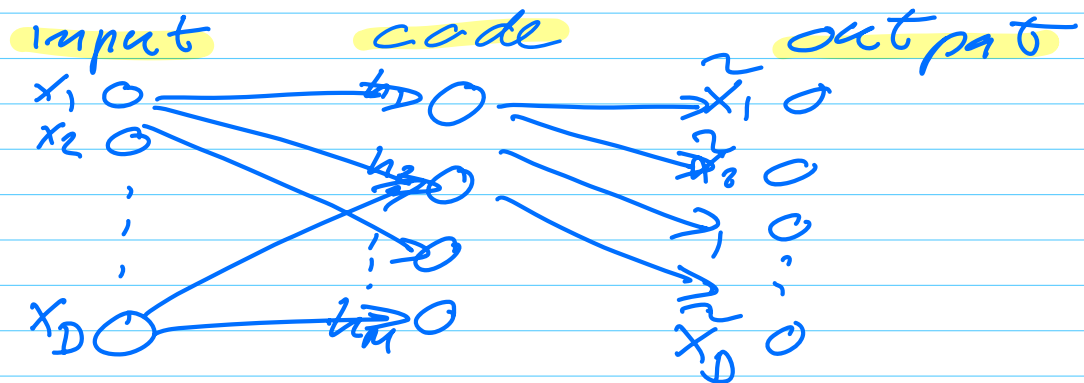


FYS5429, MARCH 15, 2023

Autoencoder



Encoder

which maps x to h via a function f
 $h = f(W, x)$

Decoder

$\tilde{x} = g(V, h)$
 g mapping
 $h \rightarrow \tilde{x}$

The goal is to minimize (least square)

$$\arg \min_{W, V} \frac{1}{n} \sum_{i=0}^{n-1} (x_i - \tilde{x}_i)^2$$

$$h = W \cdot x \quad (\text{linear dependence})$$

$$\tilde{x} = V \cdot h = V \cdot W \cdot x$$

$$\arg \min_{W, V} \frac{1}{n} \| (x - W \cdot V x) \|_2^2$$

This is the same as the training of a subspace given by PCA.