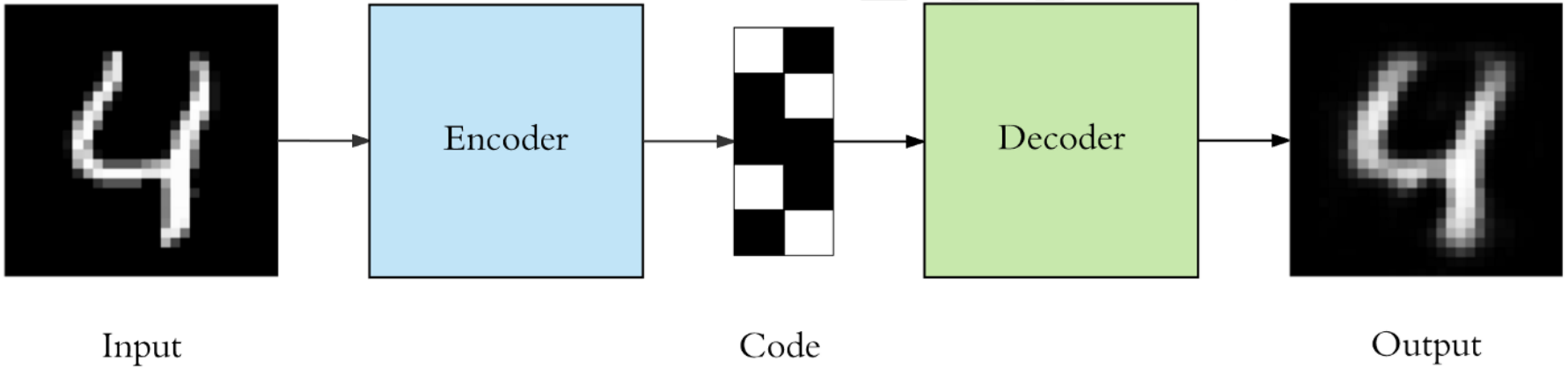
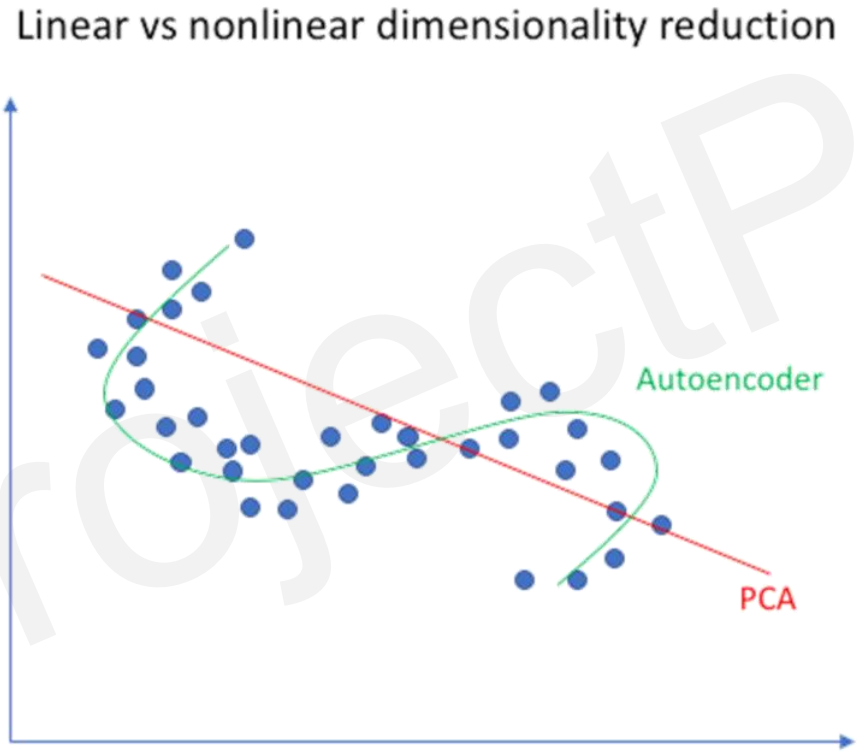
Deep Autoencoder

Project Pro

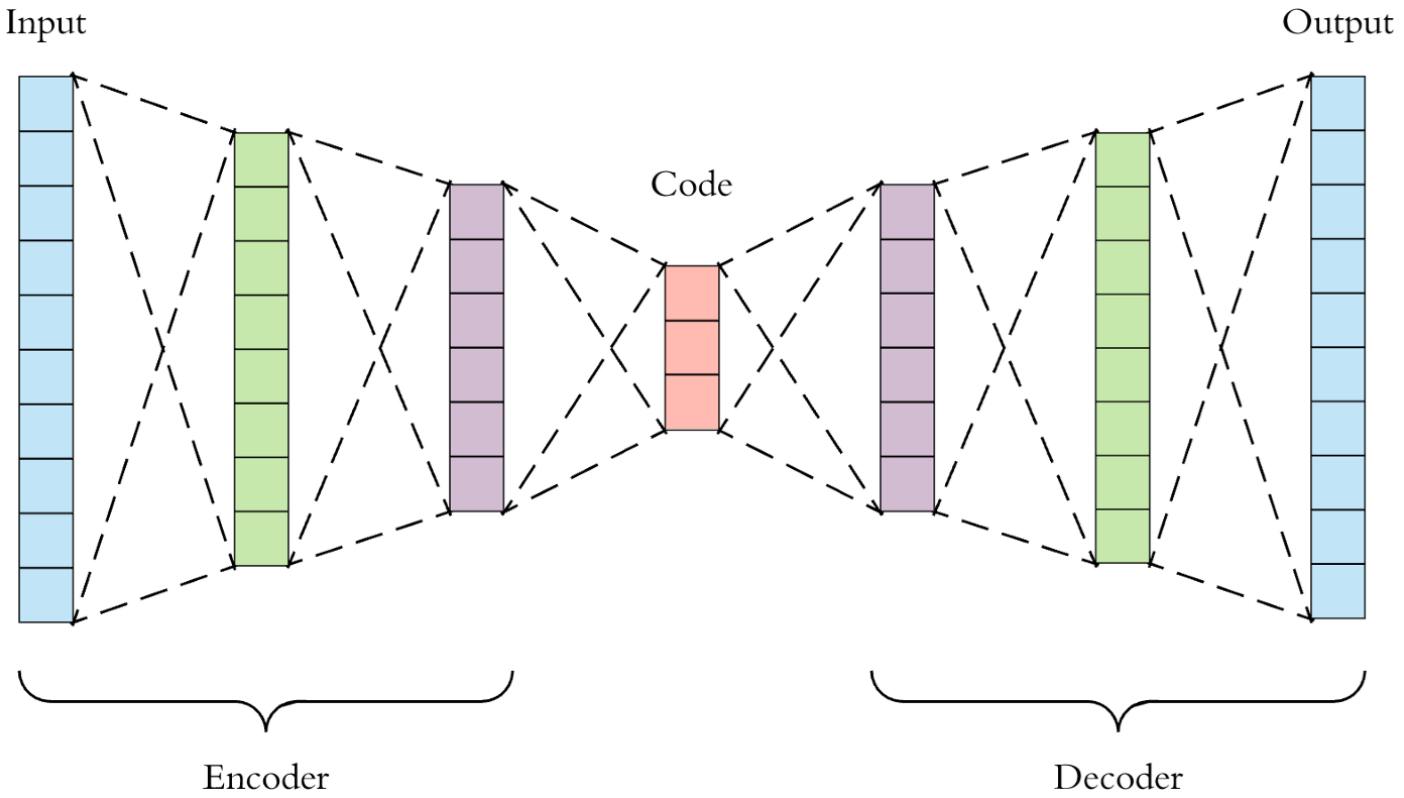
We all have seen this….



But why?



Architecture



What’s in there!

- Specific to data
- Lossy
- Fast

Hyperparameters

- Number of layers
- Number of neurons
- Compression size
- Loss function

Loss Function

- Mean Squared Error

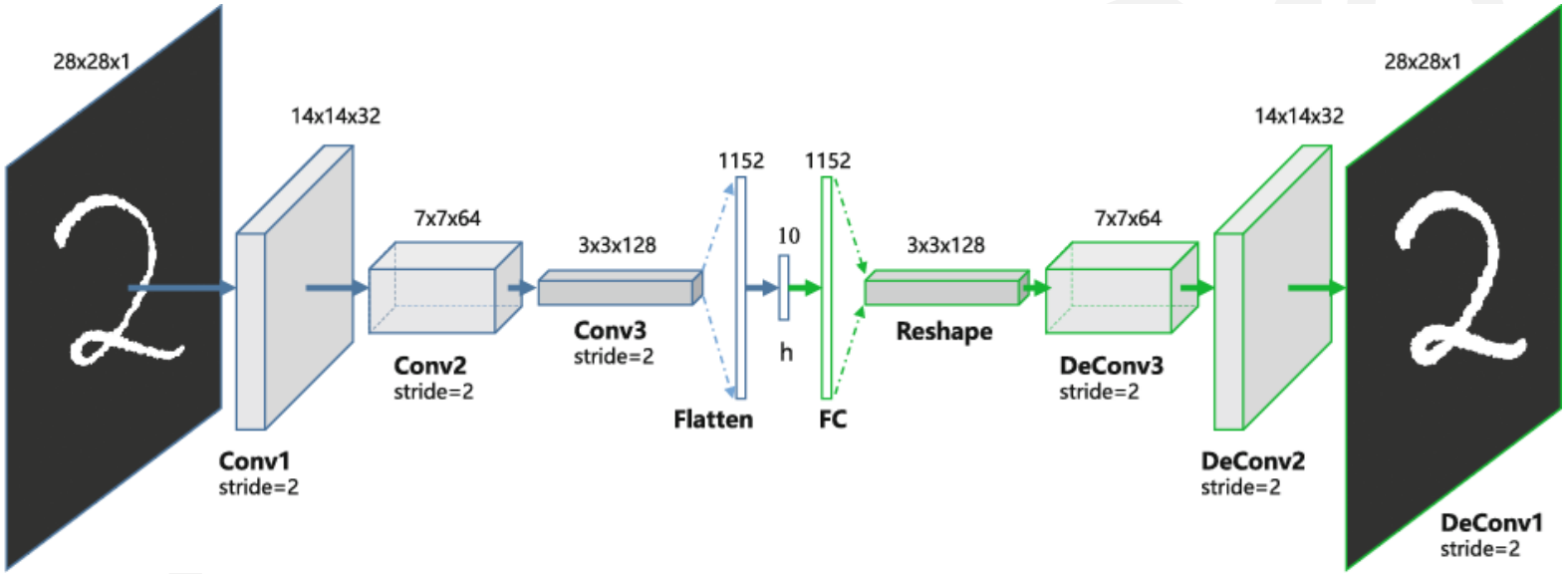
$$MSE = \frac{\sum_{i=1}^{n}(y_i - \hat{y}_i)^2}{n}$$

- Cross-entropy Loss

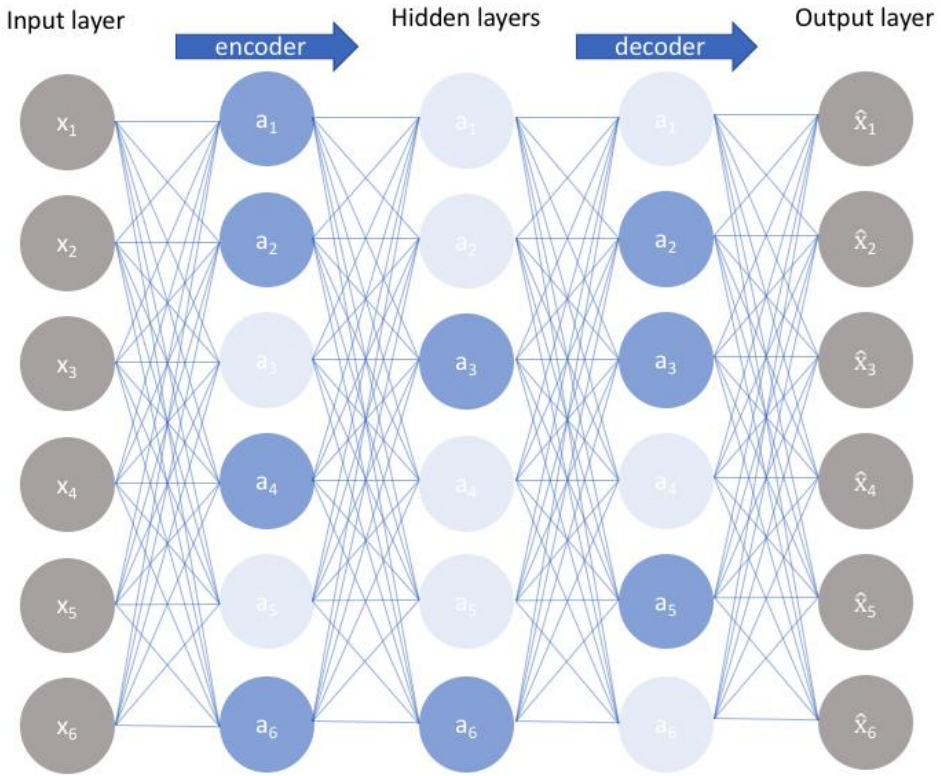
$$CrossEntropyLoss = -(y_i log(\hat{y}_i) + (1 - y_i) log(1 - \hat{y}_i))$$

Cross Entropy

Autoencoders++



Sparse Autoencoders



Denoising Autoencoders

- Denoising autoencoders (DAE) try to achieve a good representation by changing the reconstruction criterion

- Two assumptions are inherent to this approach:
  - Higher level representations are relatively stable and robust to the corruption of the input;
  - To perform denoising well, the model needs to extract features that capture useful structure in the input distribution

Applications

- Dimensionality reduction
- Information retrieval
- Anomaly detection
- Image processing

Thank You