Week 9

**Unsupervised Learning**

Uses unlabelled data.

Graphical user interface, text

Description automatically generated

Dimensionality reduction

Waterfall chart

Description automatically generated

Clustering

Group together a bunch of different data into clusters. Diagram

Description automatically generated

Probability Density Estimation

A picture containing chart

Description automatically generated

Generation / Synthesis

A picture containing timeline

Description automatically generated

A picture containing text

Description automatically generated

**Auto Encoders**

A method of Unsupervised Learning

Observed variable (x) : data used for training and testing

Latent variable (z) : we don’t know the information about the label, so we have to infer it.

A picture containing text

Description automatically generated

Diagram

Description automatically generatedDiagram, text, schematic

Description automatically generated with medium confidence

Graphical user interface, text, application

Description automatically generated

Identity matrix is useless since the output image is same as input image.

To solve this problem, we use bottleneck layer to compress the image.

Chart, diagram, scatter chart

Description automatically generated

Wider bottleneck(more neurons) layer has better output but less compression.

Text

Description automatically generatedDiagram

Description automatically generatedDiagram

Description automatically generated

Application of AE

Timeline

Description automatically generated with medium confidence

When there is limited data available for supervised learning we use encoder part of the network to make clusters of the unlabeled data with the perceptron neural network

Chart, diagram, scatter chart

Description automatically generated

Chart, diagram

Description automatically generated

We can’t generate real data from this

Diagram

Description automatically generated