Week 7

**Linear Regression**

Chart, scatter chart

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**Multilayer Perceptron**

Diagram

Description automatically generated

**Convolutional Neural Network**

Perceptron uses too much computation between its parameters hence we use CNN.

Dot product between image and kernel.

Depending on the kernel selection, we get different outputs. Table

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Diagram

Description automatically generated

The spatial region of the image is reduced after every operation.

The depth of the kernel should always explore the full end of the input image. i.e., depths should be same.

Pooling is used to reduce the size of the activation map.

Image size are spatial dimension and depth is the channel dimension.

Stride is the gap between each kernel operation on the input image.

Activation maps

Diagram

Description automatically generated with low confidenceDiagram

Description automatically generated

A picture containing chart

Description automatically generated

Size of the output: Text

Description automatically generated with low confidence

N is the input image, F is the kernel size

Zero padding is added to maintain the spatial size of the input image.

Text

Description automatically generated

Text

Description automatically generated

Pooling is like kernel operation, but we don’t perform dot product operation.

Max pooling – select the max value from the pooled area.

Text

Description automatically generated

The depth/activation map refers to the classification outputs in the image.

Finding one object is called localization.

Finding many objects is called object detection.

Semantic segmentation is classifying many objects in the image.

The number of variables determine the classification of the object from the image.

Diagram

Description automatically generatedDiagram

Description automatically generated

For upsampling

A picture containing table

Description automatically generatedBox and whisker chart

Description automatically generatedText, letter

Description automatically generated

**Data processing**

Normalization of Data Diagram

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