

# **1. Deep Learning for Computer Vision**

(ANN Architecture)

- ❖ MNIST images Classification  
(multi class classification, grayscale images)
- ❖ Male Female Classification  
(binary classification, grayscale images)

# **2. Deep learning for computer vision**

(CNN Architecture)

Applying techniques are:

- Data Augmentation
  - Using Pre-trained model
  - Feature extraction with a pretrained model
  - Fine-tuning a pretrained model
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- ❖ MNIST images Classification  
(multi class classification, grayscale images)
  - ❖ Cats vs. Dogs Classification  
(binary classification, rgb images)
  - ❖ skin\_cancer\_malignant\_vs\_benign  
(binary classification, rgb images)

- ❖ Sign Language Recognition (ASL)  
(multi class classification, rgb images)
- ❖ Male Female Classification  
(binary classification, grayscale images)
- ❖ Flowers Classification (variation of classes , Mixed dataset)  
(multi class classification, rgb images)

### **3. HeatMaps using pre-trained model**

- ❖ elephant\_heatmaps\_with\_vgg16
- ❖ heatmaps\_with\_InceptionV3

### **4. Images Segmentation**

- ❖ Cats vs. Dogs Datasets  
(binary classification, rgb images)

### **5. Object Detection using Yolov5**

- ❖ Create own datasets and trained model

## **Classification and regression**

- ❖ Classifying movie reviews: A binary classification example (IMDB Datasets)
- ❖ classifying newswires: A multiclass classification example (The Reuters dataset)
- ❖ Predicting house prices: A regression example (The Boston housing price dataset )

## **Deep learning for time series**

- ❖ Jena weather dataset  
(jena\_climate\_2009\_2016.csv)

Applying Techniques:

- Dense Network
- LSTM Network
- RNN Network

## **Deep learning for text**

- ❖ IMDB movie reviews data

(binary classification)

Two Approaches:

- Processing words as a set: The bag-of-words approach
- Processing words as a sequence: The sequence model approach

## **Implementing DeepDream in Keras**

- ❖ Neural style transfer
- ❖ A schematic GAN implementation

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