Some useful datasets

https://www.kaggle.com/macostrans/eda-cleaning-and-predictions-on-rain-data

https://www.kaggle.com/c/digit-recognizer/data?select=train.csv

https://www.kaggle.com/suniliitb96/test-files-prepd

<https://www.kaggle.com/keras/resnet50>

[https://drive.google.com/drive/folders/1sv-aTR9CYxvGUyeNvm5kzVLGZVIdTQpM?usp=sharing](https://drive.google.com/drive/folders/1sv-aTR9CYxvGUyeNvm5kzVLGZVIdTQpM?usp=sharing&authuser=1)

<https://github.com/chahat-tandon/Symbiosis_Sessions/tree/main/Session%201>

1. Dataset

<https://www.kaggle.com/gpiosenka/100-bird-species>

2. Data pre-processing

<https://www.geeksforgeeks.org/cnn-image-data-pre-processing-with-generators/>

<https://machinelearningmastery.com/prepare-text-data-machine-learning-scikit-learn/>

<https://machinelearningmastery.com/convolutional-layers-for-deep-learning-neural-networks/>

4. HTML / FLASK:

<https://www.w3schools.com/bootstrap/bootstrap_forms_inputs.asp>

Udemy course: Basics of deep learning

SECTION 1

Biological Neuron

1. Reticular theory (1871-73) by Joseph Von

He proposed that neutrons are no discrete cells but a SINGLE continuous network of cells

2. Camilo Golgi

Then he used staining technique to depict the neurons and he also came to the same conclusion that the brain cells are a single continuous network of cells.

3. Neuron Doctrine theory (1888) by Santiago Ramon Y Cajal

He used the same staining technique of Golgi but he reached a different conclusion. His conclusion was the neurons are discrete cells that are interconnected with each other

4. In 1906, Nobel prize for medicine was shared by both Golgi and Cajal that led to a lot of controversy (public disagreement)

5. In 1950, the invention of electron microscope observed that there were gaps between two neurons know as SYNAPSES. At this time the debate between Cajal and Golgi was settled .

——————————————————————————————————————————————————————

Approximately, there are 100 billion neutrons in an adult. Each neutron is connected up to 10,000 other neutrons through connections called SYNAPSES. Neurons vary in length.

Neuron fires electric signal when the membrane potential crosses threshold value (action potential)

These electronic signal travels through the axion and reaches the SYNAPSES that are activated by neuro transmitters

neurons that fire together wire together

if you do not use a connection you lose it

——————————————————————————————————————————————————————

Artificial Neuron

1) McCulloch & Pitts Neuron (MP neurons)

He postulated the first artificial neuron. MP neurons can be used to solve decision problems such as, AND, OR, NOR, NOT gates. But not all boolean functions can be represented by MP neurons for example, XOR.

a. Input layer (boolean: 0,1)

b. Aggregration layer (sum of all input)

c. Decision layer

d. Output layer

2) Perceptron

Not all inputs are boolean so they could be real values. There is a learning algorithm that can assign weights (w1, w2, w3, …, wn). These weights are assigned to each input. Inputs are given importance through these weights. Perceptron cannot learn some simple functions i.e. XOR However, people thought that perceptron could not solve real life problems therefore, people stopped giving funds to AI projects.

y = f(x)

x and y are real numbers, not boolean values

w - weight

b - bias

linear model Z = w1x1 + b

there is a steep decline

3) Sigmoid Neuron

more useful

Multi-Layer Network

1) Multi-Layered Perceptron

there are ’n’ number of hidden layers between input layer and output layer

hidden layers are the abstract property that are concluded at the combination of input and the weights

Universal Approximation theorem helped in invest in AI

Universal Approximation theorem states that a multi-layered network of neutrons with a SINGLE hidden layer can solve any kind of real life problem if it has a continuous function.

Historical development

Business Applications of Deep Learning

AUTOMATION

Automation is the process where a machine can do a task much faster than a normal human being can.

SECTION 2: Key concepts of deep learning

From Machine learning to Deep learning

Calculating the price of the house based on the area

In real life relationships, independent and dependent values are not linear hence, we need hidden representation

Constructing an ANN

Polynomial relationship

First layer is the data layer

Next few layers are hidden layers

Last layer is output layer

Gradient Descent

Backpropagation

Handling classification problems