Page:
Date: / /

AIDL.

1] Anaconda
- Anaconda is a free & open-source distribution of the Python for scientific computing.
- In Anaconda, Package versions are managed by package management system conda.

2] Anaconda Navigator
- Anaconda Navigator is a desktop GUI that allows users to launch applications & manage conda packages, environments & channels without using command-line commands.

3] Tensorflow
- Tensorflow is an end-to-end open source platform for ML. It has comprehensive, flexible ecosystem of tools & community resources that lets developers to build & deploy ML applications easily.

4] Keras
- Keras is deep-learning framework for Python that provides a convenient way to define & train any kind of deep-learning model.
- It allows same code to run on CPU or GPU.
- It has user friendly API.

5] Neural networks
- Neural networks are comprised of node layers, containing an input layer, one or more hidden layers & an output layer. Each node or neuron is connected to

another and has associated weight & threshold.

6] shallow neural network
- A neural network consisting of input with one hidden layer & one output layer is called as shallow neural network.
- Hidden layers learns the representation from input & forward it to output layer.
Output layer provides predicted output.

7] parameters
- The weights & bias are called parameters.
- In deep neural network, weights & bias are searched with help of loss function & optimization algorithm.

8] hyperparameter
- A hyperparameter is a parameter whose value is set before the learning process begins.
- Ex - learning rate, hidden units, no. of layers, no. of units in each layer.

9] Regression
- Regression is a method of modeling a target value based on independent predictors.
- This method is mostly used for forecasting & finding out cause & effect relationship bet variables.

10] K - cross validation
- It consists of splitting the available data into K partitions & training each one on

Page:
Date: / /

k-1 partitions evaluating on the remaining partition. The validation score for the model used is then the avg of k validation scores obtained.

11] Convolutional Neural Network [CNN] / [ConvNet]

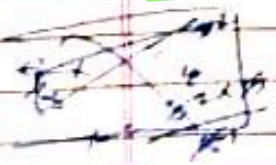
- Convolutional Net Neural network are a specialized kind of neural network for processing data that has a known, grid-like topology.
- Ex - time series data.
- It includes two types of layers -
  ① convolutional layer - It extracts features from input image by applying convolution operation.
  ② pooling layer - It reduces size of representation to reduce amount of parameters & computation in network.

12] ~~Ste~~ Stride

- Stride is imp property of convolution operation. It represents distance bet^n two successive sliding windows over the image.

13] Pretrained network.

= A pretrained network is a saved network that was previously trained on a large dataset, typically on a large-scale image classification task.



There are two ways to train the pretrained network:-

① feature extraction -
It consists of using the representations learned by a previous network to extract interesting features from new samples.

② Fine-tuning -
It consists of unfreezing a few of top layers of a frozen model base used for feature extraction.

[4] Recurrent neural network
- RNNs are family of neural networks used for processing sequential data. It is specialized for processing a sequence of values.

[5] Vectorizing text
- Process of transforming text into numeric tensors.

[6] Tokenization
- develop tokens from text.

[7] Two ways to generate vector for token
- ① One hot encoding
simplest & easiest way
problems - sparseness & high dimensions
② Token embedding

Page:
Date: 11

18] Sentiment analysis
- It consists of determining whether a comment expresses positive or negative sentiment.
- IDBM is benchmark database for sentiment analysis

19] LSTM
- stands for long short-term memory networks
- used in field of deep learning
- It is variety of RNN that are capable of learning long-term dependencies, especially in sequence prediction problems.

20] Keras REST API
- self-contained

20] Flask
- flask is python web framework.

21] activation function
- An activation function decides whether a neuron should be activated or not by using simpler mathematical operations.
- Used to compute weighted sum of inputs & biases.

22] Sequential model
- Sequential models are the ML models that input or output sequences of data. Sequential data includes text, audio clips, video clips.

23] tanh function.
- type of activation fun^
- stands for tangent hyperbolic
- Its range is -1 to 1.
- shifted version of sigmoid fun^

24] sigmoid fun^
- also called as logistic fun^
- takes any real value as input & outputs a value in range (0,1).

25] AI - AI is the simulation of human intelligence processes by machines, especially computer systems. Specific applications of AI include expert systems, natural language processing, speech recognition & machine vision.

26] ML - ML is a type of AI that allows software applications to become more accurate at predicting outcomes without being explicitly programmed to do so. ML algorithms use historical data as input to predict new output values.

27] DL - Deep learning is a machine learning technique that teaches computers to do what comes naturally to humans. In DL multiple layers of processing are used to extract progressively higher level features from data.

28] Types of ML

- (1) Supervised ML -
Machines are trained using well labelled training data & on the basis of that data machines predict the output. Aim of supervised learning algo is to find a mapping function to map the input variable (x) with the output variable (y).

applications - image classification, spam filtering, fraud detection

(2) unsupervised ML -
It a type of ML in which models are trained using unlabeled dataset & are allowed to act on that data without any supervision.

applications - recommendation systems, products segmentation, similarity detection.

(3) semi-supervised ML -
Intermediate bet supervised & unsupervised. It uses combination of labeled & unlabeled datasets during the training period.

appli - speech analysis, text doc classifier

~~(4) reinforcement ML -~~

Page:
Date: / /

29] Types of AI -

① Weak AI or narrow AI -
It is type of AI which is able to perform a dedicated task with intelligence. Ex - Apple Siri's

② General AI -
It is type of intelligence which could perform any intellectual task with efficiency like a human.

③ super AI -
super AI is a level of intelligence system at which machines could surpass human intelligence & can perform any task better than human with cognitive properties.

30] Domains of AI
① ML ② DL ③ Natural lang. processing
④ computer science ⑤ Data science.

31] Max pooling -
Max pooling is a pooling operation that selects the max element from the region of the feature map covered by the filter.

Page :
Date : 1 1

23] tanh function.
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PAGE NO.

Diff bt° library & framework.

- library →

- A library is a collection of reusable, compiled & tested code that can facilitate the automation of application functionalities.
- A library implements many functions, variables & parameters.

Framework →

- Framework provides ready to use tools, standards, templates & policies for fast application development.
- Framework is collection of libraries implementing a particular methodology.

NAME OF THE STUDENT :- _____

CLASS :- _____

DKTE

LSTM :- long-short term memory :- It is a variety of RNN's that are capable of learning long-term dependencies, especially in sequence predication problem
- LSTM has feedback connection

K-fold :- Repeat the process of randomly splitting the data set into training & test times.

* 4 gates in LSTM:
1) Input modulation gate
2) input gate
3) forget gate
4) out-put gate

max pooling
It return the maximum value from the portion of image covered by the kernal

Avg pooling
it return average value of the portion

Units in LSTM :- The Number of Units is the Number of Neurons connected to the layer holding the concatenated vector of hidden state and input

loss function :- loss function is a measure of how good your predication model does in terms of being able to predict the expected outcome

Deep Neural Network :- DNN is an ANN with multiple hidden layers between the input and output layers.

Tokenization :- - Tokenization is breaking raw text into small chunks.
- Tokenization breaks the raw text into words, sentences called tokens.
- These help in understanding the context or developing the model for NLP
- Tokenization helps in interpreting the meaning of the text by analyzing the sequence of the words.

Sigmoid function :- - mathematical function having characteristic "S" shaped curve or sigmoid curve
- S function performs the role of an activation function in machine learning.
- Basically the function determines which value pass as output and what to not pass as output.

Vectorization :- is the process of transforming text into Numeric tensors

AI DL

Activation function :- 1) Activation function decides whether a neuron should be activated or not

2) This means that it will decide whether the neuron's input to the network is important or not in the process of predication using simpler mathematical operations.

formula :-

Elements of a Naural network

1) Hidden layer :- Model of this layer are not exposed to the outer world, they are part of the abstraction provided by any Neural network.

- The Hidden layer performs all sorts of computation on the feature entered through the input layer and transfers the result to the output layer.

2) Input layer :- This layer accepts input features. It provides information from the outside world to the network
- No computation is performed at this layer.

3) output layers :- This layer bring up the information learned by the network to the outer world

— x — x —

Learning Rate :- learning rate is a hyper parameter that controls how much we are adjusting the weight of our network with respect to loss gradient

Learning rate decay :- is a technique for training modern Neural Network. It starts training the network with a large learning rate and then slowly reducing it until local minima is obtained.

Hyper parameter :- Hyperparameter are parameter whose values control the learning process and determine the values of model parameters that a learning algorithm end up learning

Avoid variance
1) Add more data
2) Decrease model size
3) Add regularization
4) Feature selection.

Date: / /
Page No:

* Keras - Framework of deep learning for python it is used define & train model

* Neuron :- A layer consist of small individual unit it called neuron.

Date / /
Page No

* Type of NN.

① Multilayer Perceptron

② Convolutional NN

③ Radial Basis functional NN

④ Recurrent NN

* Max Pooling
- It returns the maximum value from the portion of image covered by the Kernel

Avg Pooling
- It returns average value from the portion of image which covered by Kernel.

* Parameters :- are the configuration model which are internal to the model,
— No. of layer, No. of neuron, no. of training iterations, No. of hidden neuron.

* K-Fold validation - repeat the process of randomly splitting the data set into training & test set time.

Logistic classification between two class it returns real numbers

* RNN - type of neural network where output from previous step are fed as i/p to current step

shallow NN

① Doesn't be only one hidden layer

② rotes or unrelated detail

Deep NN

① Doesn't [illegible] layer

② [illegible]

* hyperparameter :- hyperparameter is parameter whose value is set before the learning process begin
- some of parameter are learning rate, hidden unit, mini batch size, beta, no. of layer, no of unit in each layer
- This hyperameter need to set correct value to avoid overfitting & underfitting.

* learning rate :- it's a hyperparameter that controls the weight of our NN with respect to loss gradient.
- it define how quickly update NN.

* decay rate :-

* Activation function :- it decide wheather or neuron should be activated or not, means it will decide wheather neuron input to the network is important or in the prediction process.

* Hidden layer :- it perform non-linear transformation of the input entered into the network

* Vectorization :- it's technique by which you can make your code execute fast & avoid the for loop & use all the data in one step.