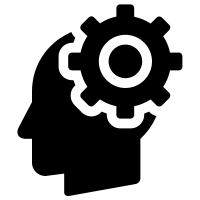
Course Curriculum



Day-1: Recap of ML concepts

1. Deep Learning Course Introduction
   1. Introduction
   2. Applications
   3. Major Topics
   4. Course structure
2. Essential Python and Basic Statistics
   1. Python Introduction
   2. Python Packages
   3. Data handling in Python
   4. Measures of central tendencies
      1. Mean
      2. Median
   5. Measures of dispersion
      1. Variance
      2. SD
   6. Percentiles
   7. Quartiles
   8. Variable distributions
   9. Outlier detection
   10. Cleaning the data
3. Machine Learning basics
   1. Linear Model
   2. The concept of the error function
   3. Building a linear model
   4. Validation of the model
   5. Regression vs. Classification
   6. The need for Logistic Regression
   7. Building a logistic regression model
   8. Validating the model



Day-2: Mode Validation, ANN and DNN

1. Model Validation Metrics
   1. Accuracy
   2. Sensitivity
   3. Specificity
   4. Overfitting(variance)
   5. Underfitting (bias)
   6. Bias – Variance Tradeoff
   7. Holdout cross Validation
2. ANN
   1. Logistic regression to Neural networks
   2. Concept of hidden layers
   3. Feedforward networks
   4. Error function
   5. Backpropagation algorithm
   6. Building ANN model on Python
3. Gradient Descent concept
4. Choosing the optimal model
5. Building ANN model in TensorFlow
6. Building ANN model on Keras
7. Major issues while building ANN models
8. Deep Neural Networks Introduction
9. Deep Learning Tools

Day-3: TensorFlow and ANN Hyperparameters

1. Deep Learning tool – Tensor Flow and Keras (Wrapper on Tensor Flow)
   1. Deep Learning tool TensorFlow
   2. Comparison with python libraries
   3. Introduction to TensorFlow
   4. Architecture
   5. Programming paradigm of TensorFlow
   6. TensorFlow made easy with Keras
   7. Setting up Keras
   8. Keras on TensorFlow
   9. Keras Basic Commands
2. ANN Hyper Parameters on Keras
   1. Activation functions
   2. Number of hidden layers
   3. Regularization
   4. L1 & L2 Regularization
   5. Decay parameter finetuning
   6. Dropout
   7. Learning rate finetuning
   8. Momentum
   9. Optimization functions



CNN and NLP Introduction

1. CNN
   1. CNN Introduction
   2. Issues with Standard ANN
   3. Kernel filter
   4. Convolution layer
   5. Pooling layer
   6. The fully connected dense layer
   7. Weights and number of parameters
   8. Backpropagation
   9. CNN Model building
   10. CNN Hyperparameters
   11. CNN tips and tricks
   12. CNN Project and Practical implementation
   13. How to configure and finetune CNN Models
2. Text Mining and NLP
   1. What is text mining
   2. The NLTK package
   3. Preparing text for analysis
   4. Step by step guide to preparing text data
3. Text summarisation
4. Sentiment analysis
5. Naïve Bayes technique for sentiment analysis
6. Movie review data sentiment analysis

Day-5: RNN, LSTM, and Word2Vec

1. RNN
   1. Sequential model’s introduction
   2. RNN Introduction
   3. Word Predictor model
   4. RNN theory
   5. The number of
   6. Back Propagation through time
   7. RNN case study
   8. The problem of vanishing gradients
2. LSTM
   1. Solution for vanishing gradients
   2. LSTM main idea
   3. Gates in LSTM
   4. Building LSTM models in Keras
   5. LSTM parameters
   6. RNN vs LSTM comparison
   7. LSTM Project
3. Word Embeddings
   1. Word2Vec model
   2. Word Embeddings
   3. Word2vec models in TensorFlow
   4. Word2Vec models using Gensim
   5. Google Word2Vec Model Transfer learning
   6. Word relations
   7. Context predictions
4. Course Conclusion
   1. Couse conclusion
   2. Reference books, videos, and blogs
   3. Next steps
   4. Final Q&A
   5. Final assessment (optional)

Appendix

List of Case Studies used in the course

1. Air passenger prediction and driver analysis -Regression
2. Product sales analysis – Logistic Regression
3. Customer attrition analysis -Logistic Regression
4. Customer attrition analysis – Model selection and cross-validation
5. Productivity data -Neural networks
6. Image recognition -Neural networks
7. Object Recognition problems – CNN
8. Digit recognizer - CNN
9. Next word prediction – RNN
10. Three-gram data prediction - RNN
11. Predicting the next letter LSTM
12. Word generation – LSTM
13. Hand Signal Recognition – CNN
14. Language Translation - LSTM

