

Applied Deep Learning with Keras

Course Summary

Description

This course takes you from a basic knowledge of machine learning and Python to an expert understanding of applying Keras to develop efficient deep learning solutions. This course teaches you new techniques to handle neural networks, and in turn, broadens your options as a data scientist.

Applied Deep Learning with Keras takes you from a basic level of knowledge of machine learning and Python to an expert understanding of applying Keras to develop efficient deep learning solutions. To understand the difference between machine and deep learning, you will build a logistic regression model once with scikit-learn and then with Keras. By building prediction models for several real-world scenarios, such as disease prediction and customer churning, you will dive deep into Keras and its many models. You will also gain knowledge about how to evaluate, optimize, and improve your models to gain maximum information. You will learn how to use Keras Wrapper with scikit-learn and implement cross-validation techniques on your findings, and apply L1, L2, and dropout regularization techniques to improve the accuracy of your model. Because accuracy itself might not be up to the mark, you will learn to apply the null accuracy, precision, sensitivity, specificity, AUC-ROC score techniques to fine tune your model. Then, you will dive deep and explore the convolutional and recurrent neural networks in detail

Objectives

This course takes a practical approach to equip beginners with the most essential data analysis tools in the shortest possible time. It contains multiple activities that use real-life business scenarios for you to practice and apply your new skills in a highly relevant context. Here is the list of course objectives:

- Understand the difference between single-layer and multi-layer neural network models
- Use Keras to build simple logistic regression models, deep neural networks, recurrent neural networks, and convolutional neural networks
- Apply L1, L2, and dropout regularization to improve the accuracy of your model
- Implement cross-validate using Keras wrappers with scikit-learn
- Understand the limitations of model accuracy

Topics

- Introduction to Machine Learning with Keras
- Machine Learning versus Deep Learning.
- Deep Learning with Keras
- Evaluate your Model with Cross Validation with Keras Wrappers
- Improving Model Accuracy
- Model Evaluation
- Computer Vision with Convolutional Neural Networks
- Transfer Learning and Pre-Trained Models
- Sequential Modelling with Recurrent Neural Network

Audience

If you have basic knowledge about data science and machine learning and want to upgrade your skills to learn about artificial neural networks and deep learning, you can accomplish a lot with this course. Prior experience of programming in Python and familiarity with statistics and logistic regression will help you get the most out of this course. Though not necessary, it will be an added bonus if you are familiar with the scikit-learn library.

Duration

Three Days

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Course Outline

- I. *Introduction to Machine Learning with Keras***
 - A. Getting acquainted with symbolic AI and machine learning
 - B. Revisit Machine Learning with Scikit Learn.
 - C. Build a Logistic Regression Model with Scikit Learn

- II. *Machine Learning versus Deep Learning.***
 - A. Learn the Limitations of Machine Learning.
 - B. Introduction to Deep Learning and how is it different from Machine Learning
 - C. Learn about Scalars, Vectors, Matrices and Tensors.
 - D. Build a Logistic Regression Model with Keras

- III. *Deep Learning with Keras***
 - A. Learn Keras as a Sequential Model
 - B. Build Multi-Layer Keras Model
 - C. Learn About Overfitting and Underfitting

- IV. *Evaluate your Model with Cross Validation with Keras Wrappers***
 - A. Learn About Keras Wrapper with Scikit Learn.
 - B. Use Cross validation techniques to understand your model.
 - C. Write user defined functions to implement ANN model along with Cross Validation

- V. *Improving Model Accuracy***
 - A. Understand and Master the concept of Regularization.
 - B. Learn About L1 and L2 Regularization
 - C. Apply L1, L2 and Dropout Regularization to improve Accuracy
 - D. Using Parameter tuning and grid search to improve model accuracy

- VI. *Model Evaluation***
 - A. Learn about the limitations of accuracy
 - B. Understand the concepts of Null Accuracy, Precision, Sensitivity, Specificity, AUC-ROC score

- VII. *Computer Vision with Convolutional Neural Networks***
 - A. Learn about Convolution Neural Networks
 - B. Learn about convolution layer, pooling and flattening the layer
 - C. Implement concepts like Max pooling, Flattening, feature Map, feature detection

- VIII. *Transfer Learning and Pre-Trained Models***
 - A. Learn about Pre-trained Data Sets
 - B. Use Pre-trained Datasets with for image classification problems
 - C. Fine tune the algorithm

- IX. *Sequential Modelling with Recurrent Neural Network***
 - A. Learn about Sequential Modelling
 - B. Learn about Recurrent Neural Networks
 - C. Learn about LSTM