

TensorFlow and Keras

Course Content

Lesson 1 - Introduction to TensorFlow and Keras

- Installation and setup
- High-level vs low-level APIs
- TensorFlow 2.x basics

Lesson 2 - Computational Graphs and Tensors

- Understanding tensors
- Graph operations
- Sessions and execution

Lesson 3 - Building Neural Networks

- Layers and activations
- Sequential and functional APIs
- Network architecture design

Lesson 4 - Activation Functions and Loss Functions

- ReLU, sigmoid, softmax
- Loss functions for classification/regression
- Choosing the right activation

Lesson 5 - Optimizers and Backpropagation

- SGD, Adam, RMSProp
- Backpropagation mechanism
- Learning rate tuning

Lesson 6 - Convolutional Neural Networks (CNN)

- Convolution and pooling layers
- Building a simple CNN
- CNN applications

Lesson 7 - Recurrent Neural Networks (RNN)

- RNN architecture
- LSTM, GRU overview
- Sequence modeling

Lesson 8 - Transfer Learning with TensorFlow

- Pre-trained models
- Fine-tuning layers
- Transfer learning workflows

Lesson 9 - Saving and Deploying Models

- Model checkpoints
- SavedModel format
- TensorFlow Serving

Lesson 10 - Practical Projects in TensorFlow/Keras

- Putting it all together
- Troubleshooting networks
- Best practices

Capstone Project

- Develop a neural network for image or text classification with deployment pipeline.