

Deep Learning – CNN for Image Processing using TensorFlow and Keras

Course Duration: 20 hours

Mode of Delivery: Online, LIVE, Instructor Led

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ABOUT THIS COURSE

The goal of this course is to deliver an advanced level of skill on various **complex Image processing aspects using Deep Learning**. Convolution Neural Networks using **TensorFlow and Keras Libraries** are used as medium of solving the Image Processing problems used in this program. You would learn critical concepts such as various types of **CNN architectures, optimization using multiple loss functions and optimizers, image data augmentation techniques, Semantic Segmentation, YOLO Networks**, and such. A number of mini projects will be walked through and unseen projects will be provided as assignments.

INTENDED AUDIENCE

Individuals interested to master Deep Learning – Image and Video Processing skills. Develop the ability to perform complex tasks such as Image Detection, Image Tagging, Object detection, Image Localization, Object Segmentation, etc.

PRE-REQUISITE

Exposure to Python Language and some basic knowledge of Machine Learning concepts are expected.

TEACHING METHODOLOGY

The Delivery method is Online, Live Classes led by Professional, Industry Experienced Instructors.

DURATION

20 Hours of total sessions:

- 2 hours x 10 Weekdays or
- 3 hours x 3.5 weekends

CERTIFICATION

Certificates will be issued to every learner based on attendance and successful completion of the Course Assignments.

SKILLS YOU WILL ACQUIRE

- Artificial Neural Network
- Deep Neural Network
- Convolutional Neural Network
- TensorFlow
- Keras

UNDERSTANDING DEEP LEARNING TRENDS AND MARKET

"Success in creating AI would be the biggest event in human history."

-- Stephen Hawking

Why Deep Learning

Artificial Intelligence is on a rage! Everyone in the Technology world is talking about it and it is being touted as the godsent miracle to solve the most complex problems mankind wants to solve. Understanding the latest advancements in artificial intelligence can seem overwhelming, but it really boils down to two very popular concepts **Machine Learning** and **Deep Learning**. However, **Deep Learning** is gaining much huge popularity due to its clear supremacy in terms of performance in solving very complex problems.

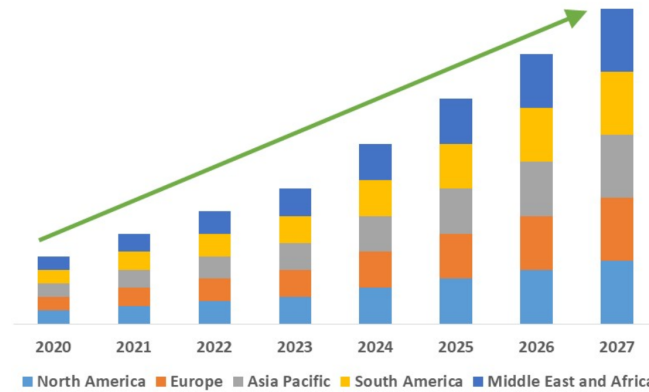
As per Andrew Ng, Founder and Head of the Google Brain Project, "Deep-learning will transform every single industry. Healthcare and transportation will be transformed by deep-learning. I want to live in an AI-powered society. When anyone goes to see a doctor, I want AI to help that doctor provide higher quality and lower cost medical service. I want every five-year-old to have a personalised tutor."

Deep Learning Market Trend

The Deep Learning Market is expected to register a CAGR of 42.56% over the forecast period from 2020 to 2025. Deep learning, a subfield of machine learning (ML), has led to breakthroughs in several artificial intelligence tasks, including speech recognition, natural language processing and image recognition.

There is massive amounts of money that Google, Microsoft, Amazon, Facebook and others are pouring in Deep Learning Research and development of Open Source products and libraries such as TensorFlow, CNTK, Keras, Theano, PyTorch, etc. By far, TensorFlow/Keras combination are leading the market in their penetration as the de-facto choice of Deep Learning Libraries of organisations around the world.

Global Artificial Intelligence Market, By Offering (Hardware, Software and Services), Technology (Machine Learning, Deep Learning, Natural Language Processing, Context-Aware Computing, Computer Vision), End-User Industry (Healthcare, Manufacturing, Automotive, Agriculture, Retail, Security, Human Resources, Marketing, Law, Fintech, Construction, Defense, Aerospace, Supply Chain, Building Automation, Consumer, Food and Beverage, Gaming, Media and Entertainment, Telecommunication and Oil and Gas) are expected to grow at a CAGR of 39.44% in the period of 2020 to 2027 to reach a level of USD 300 Billion by 2027.



This phenomena is indicative of a massive surge in demand for Data Science and Machine Learning professionals. The ones among them who possess superior Deep Learning skills are going to be the most successful and will demand salaried at a much higher rate.

Convolutional Neural Network

In deep learning, a Convolutional Neural Network or CNN is a class of Artificial Neural Networks or Deep Neural Networks, most commonly applied to analyse visual imagery. Common applications include image analysis and processing, face detection, object detection which has massive amounts of usage in many domains, emotion analysis, more complex usages include uses in self driving cars, etc.

Image processing use cases have gathered massive amount of use cases in the industry and consequently, the demand for CNN experts have surged.

CURRICULUM

The Post Graduate Program on Applied Data Science covers the following broad areas:

- Data Acquisition Techniques
- Exploratory Data Analysis using Pandas, Numpy libraries
- Visualizations using Matplotlib, Seaborn libraries
- Modelling and Predictive Techniques – Supervised Learning, Unsupervised Learning, Prediction Problems, Classification Problems, Clustering using Scikit Learn, StatsModel libraries
- Applied Part – Portfolio Projects
- Deep Learning with CNN, RNN, LSTM, Attention models using Tensorflow and Keras
- ML-Ops on GCP platform
- Data Science Leadership

Python will be used as the primary programming language throughout the course. Teksands will organise pre-course Python sessions for those with little or no exposure to Python.

COURSE STRUCTURE IN DETAIL

<i>Week #</i>	<i>What you will Learn</i>
<i>Week-1</i>	Introduction to Deep Learning <ul style="list-style-type: none"> • Understanding Neural Networks • Deep Neural Network Architectures • Introduction to TensorFlow and Keras • Training a Deep Neural Network • Gradient-based Optimisation • Chaining Derivatives and Backpropagation • Loss Functions, Optimizers, Initializers • Batch-normalization • Dropouts • Understanding Image Data • Understanding the Convolution Layer • Filters and Feature Maps • Pooling Layer
<i>Week 1-2</i>	CNN Architectures <ul style="list-style-type: none"> • LeNet-5 • AlexNet • VGGNet • ResNet • XceptionNet • SEnet • Implementing a Convolutional Network using Keras • Image Augmentation Techniques • Using Pretrained Models and Transfer Learning
<i>Week 2-3</i>	Object Detection and Segmentation <ul style="list-style-type: none"> • Fully Convolutional Networks • You Only Look Once (YOLO) Networks • Semantic Segmentation • Project Discussion

REAL-LIFE PROJECTS

You will have the following projects to work on as part of the Course. Students will be provided with a broader choice of projects to choose from.

- Object Detection
- Driver Drowsiness detection using Python
- Plant disease detection using image processing
- Traffic Sign Recognition
- Image Caption Generator
- Gender and Age Detection
- Visual Tracking System
- Emotion Detection

For more Information, please visit teksands.ai or reach out to us on

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or

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