EDUXLABS
edu's Xpert (Esoir Solution)

2-weeks Live Online FDP | Short-Training

on

Satellite Data Analysis with Deep Learning & Python

DURATION: 30-Hrs Online Live, 2-weeks

Register Now

Projects included in 2-weeks Training

1. Visualization of SpaceX Satellites Orbit
2. Preliminary understanding of Tsunami Data and Analysis
3. Satellite Images Classification
4. Roads Segmentation from Satellite Images
5. Sematic Segmentation of Satellite Imagery
6. Landslide Segmentation SAR UNET
7. Advanced object detection to arbitrarily large satellite images

2-weeks Training Content

Prerequisite: Basic knowledge of python programming

INTRODUCTION

Module 1. Introduction to AI & Deep Learning
- Introduction to Artificial Intelligence
- Introduction to Machine Learning
- Artificial Intelligence vs Machine Learning
- Benefits of Machine Learning vs Traditional Approach
- Deep Learning - Introduction
- How DL is different from all other Machine Learning methods
- Supervised and Unsupervised Learning
- Deep Learning Code Flow
  Classification and Regression in Supervised Learning
  Clustering and Association in Unsupervised Learning

DATA PREPARATION

Module 2. NUMPY & PANDAS
- Numpy Basics
- Arrays, Matrix , Mathematical, Statistical
- Pandas Basics
  Data Wrangling with Pandas

Module 3. Data Analysis – Visualization
- Introducing EDA
- Descriptive statistics, Frequency Tables and summarization
- Univariate Analysis
- Bivariate Analysis
- Plotly Package
- Creating Graphs – Bar/Pie/Line Chart/Histogram/Boxplot/Scatter
- Project – Tsunami Data Visualization by Plotly

IMAGE PROCESSING: OPENCV

Module 4: Introduction to OpenCV
- Introduction to OpenCV
- Image Processing
- Working & implementation with Image
- Edge Detection & smoothing of image
- Working with resolution
- Colour filtering on Image
- Image Contour
- Feature Extraction

NEURAL NETWORKS

Module 5: Artificial Neural Networks
- Perceptron
- Logic gates
- ANN & Working
- Single Layer Perceptron Model
- Multilayer Neural Network
- Feed Forward Neural Network
- Cost Function Formation
- Activation Function
- Cost Function Optimization
- Applying Gradient Descent Algorithm
- Stochastic Gradient Descent
- Backpropagation Algorithm & Mathematical Modelling
- Programming Flow for backpropagation algorithm
- Use Cases of ANN
- Programming Single Layer Neural Networks using Python
- Programming MLNN using Python
- XOR Logic using MLNN & Backpropagation

TENSORFLOW & KERAS

Module 6: TensorFlow
- TensorFlow library for AI
- Keras – High Level TensorFlow API
- Getting started with TensorFlow
- Installation & Setting up TensorFlow
- TensorFlow Data Structures
- Tensor board – Visualization

Module 7: Perceptron
- Perceptron
- Various activation functions in neural networks – Unit Step, Sigmoid, ReLu, Softmax, and hyperbolic functions
- Single Layer Perceptron
- Multiple Layer Perceptron
- Regression Model
- Classification Model
- Error Function or Cost Function

CNN
Module 8: CNNs (Convolutional Neural Networks)
- Convolutional Neural Network
- Understanding the architecture and use-cases of CNN
- Convolution Layer
- Kernel Matrix
- Pooling Layer – Max Pooling,
- Fully Connected Layer
- How to fine-tune a convolutional neural network
- What is transfer learning
- Deploying convolutional neural networks in TensorFlow

SEGMENTATION

Module 9: UNET – Segmentation
- What is Semantic Segmentation?
  U-Net
  Understanding Convolution, Max Pooling and Transposed Convolution
  UNET Architecture
  Deploying UNET
- **OBJECT DETECTION**
  Module 10. Deep Learning Object Detection
  Object Detection Introduction
  About the Object Detection algorithms
  YOLO
  Deploying YOLOv4

PROJECTS

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Training Highlights

- **30+ Hours live online Instructor-led Hands-on based learning with Projects.**
- **Training includes:** Soft copy of Training material, Training PPT's, Project code & Training Recording.
- Training **certificate of completion** in association with Mechanica IIT Madras

Who can attend?

- Training is best suitable for Engineering college faculty, Research scholar, Student & Working IT Professional.

Register Now

https://www.eduxlabs.com/satellite-data-analysis

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