



Generative AI & Agent AI

Course Introduction

- Introduction-What We will Learn In This Course

Introduction to Python

- Getting Started With Python
- Python Basics-Syntax
- Variables In Python
- Basics Data Types In Python
- Operators In Python

Python Control Flow

- Conditional Statements (if, elif, else)
- Loops

Data Structures Using Python

- Lists and List Comprehension
- Tuples
- Dictionaries
- Sets

Functions in Python

- Getting Started With Functions
- Lambda Function In Python
- Map Function In Python
- Filter Functions In Python

Importing, Creating Modules & Package

- Import Modules And Packages
- Standard Libraries Overview

File Handling

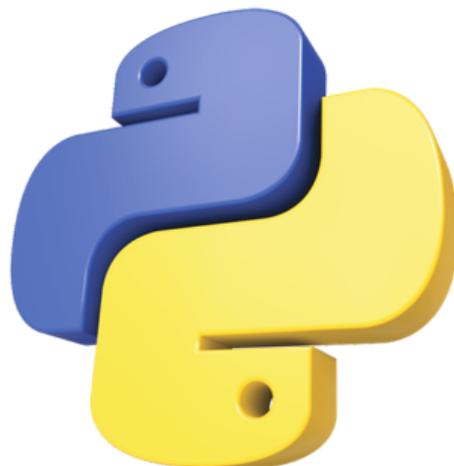
- File Operations With Python
- Working with File Paths

Exception Handling

- Exception Handling With try except else and finally blocks

Oops

- Classes & Objects
- Single And Multiple Inheritance
- Polymorphism
- Encapsulation
- Abstraction



Machine Learning for Natural Language Processing (NLP)

- ➔ Tokenization
- ➔ Text Pre-processing
 - Stemming
 - Lemmatization
 - Stopwords
- ➔ Text Vectorization
 - Bag Of Words
 - N Grams
 - TF-IDF
- ➔ Word Embeddings
 - Word2Vec
 - CBOW
 - Skip Grams
 - GloVe
- ➔ Parts Of Speech Tagging
- ➔ Named Entity Recognition

Deep Learning for (NLP)

- ➔ Welcome to the module on DL
- ➔ Introduction to DL
- ➔ Understanding Deep Learning

Recurrent Neural Networks

- ➔ RNN Forward Propagation with Time
- ➔ Simple RNN Backward Propagation
- ➔ Problems With RNN
- ➔ End-to-End Deep Learning Projects with Simple RNN

Artificial Neural Networks

- ➔ What is a Neuron
- ➔ Activation Functions
- ➔ Step Function
- ➔ Linear Function
- ➔ Sigmoid Function
- ➔ TanH Function
- ➔ ReLU Function
- ➔ Backpropagation vs Forward Pass
- ➔ Gradient Descent
- ➔ ANN Intuition
- ➔ ANN (Hyper Parameter Optimization)
- ➔ Step By Step Training With ANN
 - Optimizer
 - Loss Functions
 - Finding Optimal Hidden Layers & Hidden Neurons In ANN

Long Short Term Memory (LSTM)

- Why LSTM
 - LSTM Architecture
 - Forget Gate In LSTM
 - Input Gate And Candidate Memory In LSTM
 - Output Gate In LSTM
- Training Process In LSTM
 - Variants Of LSTM
 - GRU RNN Indepth Intuition
 - LSTM and GRU End to End Deep
 - Learning Project

Bidirection RNN

- Bidirectional RNN
 - Why To Use It?
 - Advantages & disadvantages
 - Applications

Decoders

- Introduction to Decoders
- Decoder Architecture
- GPT Architecture
- GPT (Masked Multi Head Attention)
- GPT Training

Encoders

- Introduction to Encoders
 - Encoder Architecture
 - Introduction to BERT
 - BERT Configurations
 - BERT Fine Tuning
- BERT Pre Training (Masked LM)
 - Input Embeddings BERT
 - RoBERTa
 - DistilBERT
 - ALBERT

Sequence to Sequence Architecture

- Encoder and Decoder
- Indepth Intuition of Encoder & Decoder
- Sequence to Sequence Architecture
- Problems With Encoder and Decoder

Attention Mechanism

- Seq2Seq Networks
- Attention Mechanism Architecture

Transformers

- ➔ What and Why To Use Transformers
- ➔ Understanding The basic Architecture of Encoder
- ➔ Self Attention Layer Working
- ➔ Multi Head Attention
- ➔ Feed Forward Neural Network With Multi Head Attention
- ➔ Positional Encoding
- ➔ Layer Normalization
- ➔ Layer Normalization Examples
- ➔ Complete Encoder Transformer Architecture
- ➔ Decoder-Plan Of Action
- ➔ Decoder-Masked Multi Head Attention
- ➔ Encoder and Decoder Multi Head Attention
- ➔ Decoder Final Linear And Softmax Layer



Introduction to Gen AI

- ➔ What is Generative AI- AI Vs ML Vs DL Vs Generative AI
- ➔ How Open AI ChatGpt or Llama3 LLM Models are trained
- ➔ Evolution of LLM Models
- ➔ All LLM Models Analysis

Data Preprocessing & Embeddings

- ➔ Data Preprocessing
 - Cleaning
 - embeddings
- ➔ End to end Generative AI Pipeline

Introduction to Large Language Models

- ➔ Introduction to Large Language Models & its architecture
- ➔ In depth intuition of transformer Attention all your need paper
- ➔ How ChatGPT is trained.

Vector Database

- ➔ Vector Databases
- ➔ Vector Index vs Vector Database
- ➔ How Vector db works
- ➔ Vector Database (Practicals)

Complete Guide to OpenAI

- ➔ Introduction to OpenAI
- ➔ What is OpenAI API and how to generate OpenAI API key?
- ➔ Local Environment Setup
- ➔ Hands on OpenAI Chat completion API and Completion API
- ➔ Function Calling in OpenAI
- ➔ Project: Fine-tuning of GPT-3 model for text classification
- ➔ Project: Audio Transcript Translation with Whisper
- ➔ Project: Image generation with DALL-E

Introduction to Langchain for Generative AI

- ➔ Complete Langchain Ecosystem
- ➔ Creating Virtual Environment
- ➔ Getting Started With Langchain & OpenAI

Open Source LLM

- ➔ Introduction to open source LLMs – Llama
- ➔ How to use open source LLMs with Langchain
- ➔ Custom Website Chatbot using Open source LLMs
- ➔ Open Source LLMs - Falcon

Lang Chain – Basic to Advance

- ➔ Introduction & Installation setup of langchain
- ➔ Prompt Templates in Langchain
- ➔ Chains in Langchain
- ➔ Langchain Agents and Tools
- ➔ Memory in Langchain
- ➔ Documents Loader in Langchain
- ➔ Multi-Dataframe Agents in Langchain
- ➔ How to use Hugging face Open Source LLM with Langchain
- ➔ Project: Interview Questions Creator Application
- ➔ Project: Custom Website Chatbot

Components & Modules in Langchain

- ➔ Introduction To Basic Components And Modules in Langchain
- ➔ Data Ingestion With Documents Loaders
- ➔ Text Splitting Techniques
 - Recursive Character Text Splitter
 - Character Text splitter
 - HTML Header Text Splitter
 - Recursive Json Splitter
- ➔ OpenAI Embedding
 - Ollama Embeddings
 - Huggingface Embeddings

Retrieval Augmented Generation [RAG]

- ➔ Introduction & Importance of RAG
- ➔ RAG Practical demo
- ➔ RAG Vs Fine-tuning
- ➔ Build a Q&A App with RAG using Gemini Pro and Langchain
- ➔ Retrieval Augmented Generation (RAG)

Fine Tuning LLMs

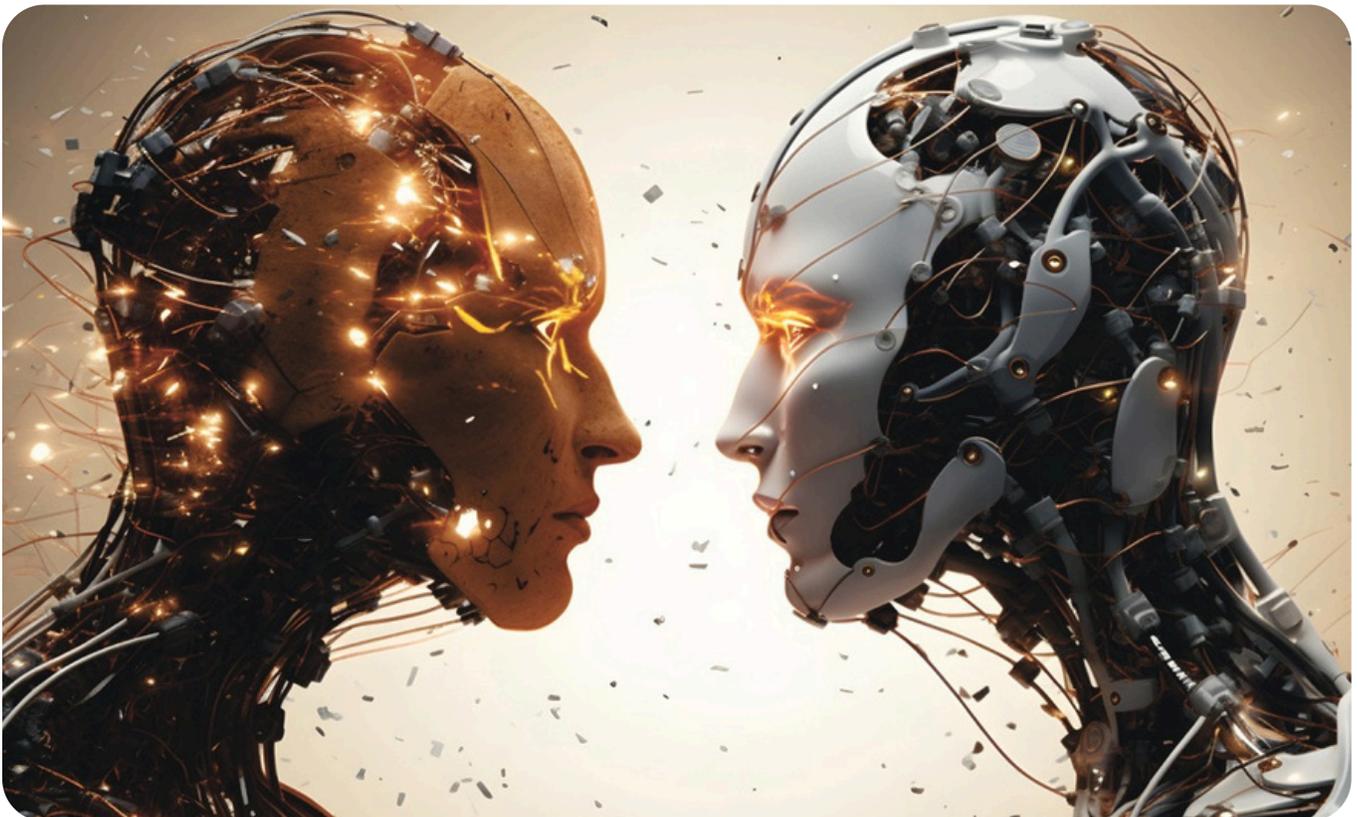
- ➔ What is fine tuning?
- ➔ Parameter Efficient Fine- Tuning
 - LoRA
 - OLoRA
 - Meta Llama 2 on Custom Data

LlamaIndex - Basic to Advance

- ➔ Introduction to LlamaIndex & end to end Demo
- ➔ Project: Financial Stock Analysis using LlamaIndex

LLM Apps Deployment

- ➔ How to Deploy Generative AI Application
 - Flask
 - AWS



Introduction to Agentic-AI

- What is Agentic-AI
- AI Agents vs Agentic AI
- Memory & planning
- Agentic Architecture
- Types of Agents
- Mutli Agents

Introduction to LangGraph

- Introduction to LangGraph
- LangGraph Application
- Setting up API Keys
- Developing a simple Graph or Workflow using LangGraph
- LangGraph Components
- Project: End to End Agentic AI Project with LangGraph

Model Context Protocol

- Introduction to Model Context Protocol
- Important components of MCP
- Communication b/w components of MCP
- Building MCP servers with Tools & Client from Scratch using Langchain

n8n

- Introduction to Automation & n8n
- Key features
- n8n Hosting Techniques
- n8n essentials
- n8n nodes
 - Trigger nodes
 - Action nodes
 - Data transformation nodes
 - Switch/filter nodes
 - Split/aggregate nodes

Agentic AI workflow in n8n

- Concept of work flow
- How to give prompts to AI Agent
- Credential setup & testing

COURSES OFFERING



**JAVA
FULLSTACK**



**PYTHON
FULLSTACK**



**UI
FULL STACK**



LINUX



**CLOUD
COMPUTING**



**DEVOPS
WITH AWS**



DSA



**SYSTEM
DESIGN**



**SOFTWARE
TESTING**



**CYBER
SECURITY**



**DATA
SCIENCE**



**DATA
ANALYTICS**

Our Recently Placed Students

Now it's Your Turn!

