

Summer Training 2024

GENERATIVE AI USING NLP

OBJECTIVE OF THE COURSE:

This course aims to provide a comprehensive introduction to generative AI with a focus on natural language processing (NLP) using Python. The curriculum is designed for intermediate learners who have a basic understanding of Python and machine learning fundamentals. By the end of the course, students will be able to build and deploy generative AI models for various NLP tasks.

DURATION: 60 HOURS (4 WEEKS).

PRE-REQUISITE: Basic knowledge of Python Programming

Module 1: Introduction to Generative AI and NLP

Week 1: Course Introduction and Fundamentals (16 Hours)

- Overview of Generative AI
- Key concepts of NLP,
- Course Logistics and setup, Python refresher
- Understanding Text Data: Types of Text Data
- Text Preprocessing Techniques
- Hands-On Session

Module 2: Language Models and Embeddings

Week 2: Word Embedding (14 Hours)

- Introduction to word embeddings
- Word2vec and GloVe
- Evaluating and Embeddings
- Hands-on : Implementing Word2Vec and GloVe
- Introduction to contextualized word embeddings
- BERT, GPT, and ELMo
- Hands-on: Using pre-trained BERT embeddings with Hugging Face

Module 3: Generative Models

Week 3: Introduction to Generative Models (16 Hours)

- Overview of generative Models
- Basics of RNN and LSTM
- Sequence modeling with RNNs
- Introduction to Transformers Architecture
- Self-attention and multi-head attention

- Hands-on: Implementing a transformer model

Module 4: Applications

Week 4: Fine Tuning and Transfer Learning (14 Hours)

- GPT architecture and training
- GPT 2 AND GPT 3
- Transfer learning in NLP
- Fine-tuning pre-trained models for specific tasks
- Hands-on: Fine-tuning BERT for text classification
- Hands-on: Creating a simple chatbot with GPT
- Case studies of generative AI applications

TOOLS AND SOFTWARE REQUIREMENTS:

- **Python(Latest version)**
- **Jupyter Notebook**
- **Libraries: NLTK, spaCy, Gensim, PyTorch/TensorFlow, Hugging Face Transformers**

Course Developed By:

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