Generative AI Training – Syllabus

Module 1: Introduction to Artificial Intelligence and Generative AI

- What is Artificial Intelligence?

- Evolution and Applications of AI

- Understanding Generative AI

- Difference between Discriminative and Generative Models

- Overview of Generative AI Use Cases

Module 2: Fundamentals of Machine Learning and Deep Learning

- Basics of Machine Learning

- Supervised vs Unsupervised Learning

- Introduction to Neural Networks

- Deep Learning Concepts: CNNs, RNNs, Autoencoders

- Basics of Model Training and Evaluation

Module 3: Generative Models Overview

- What are Generative Models?

- Introduction to:

    - Variational Autoencoders (VAE)

- ○ Generative Adversarial Networks (GANs)

- ○ Diffusion Models

- ● Applications: Image, Text, Music, and Video Generation

Module 4: Deep Dive into GANs (Generative Adversarial Networks)

- ● GAN Architecture: Generator and Discriminator

- ● Types of GANs:

  - ○ DCGAN

  - ○ CycleGAN

  - ○ StyleGAN

- ● Training Challenges in GANs and Solutions

- ● Hands-on: Building a Simple GAN Model

Module 5: Natural Language Generation (NLG)

- ● Introduction to NLP and NLG

- ● Transformers Architecture

- ● Understanding GPT (Generative Pre-trained Transformer)

- ● Overview of LLMs (Large Language Models)

- ● Fine-tuning and Prompt Engineering Basics

Module 6: Working with Diffusion Models

- ● What are Diffusion Models?

- Stable Diffusion Models

- Applications in Image Synthesis

- Hands-on: Generate Images using Diffusion Models

Module 7: Tools and Frameworks

- TensorFlow and PyTorch for Generative AI

- Hugging Face Libraries

- OpenAI API, Stability AI

- Introduction to LangChain for LLM Applications

Module 8: Ethics, Bias, and Responsible AI

- Understanding AI Bias

- Ethical Challenges in Generative AI

- Responsible AI Guidelines

- Real-world Case Studies

Module 9: Real-World Applications and Projects

- Text Generation Project (Blog/article creation using LLMs)

- Image Generation Project (Art creation using GANs/Diffusion)

- Chatbot Development using Generative AI

- Building Mini Apps with OpenAI APIs

Module 10: Deployment and Future of Generative AI

- Deploying Generative AI Models

- Introduction to APIs and Model Serving

- Future Trends: Multi-modal AI, AGI

- Career Opportunities in Generative AI

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