

Generative AI Engineering (5 Days)

Overview

This Generative AI course gives you a comprehensive overview of Generative AI Engineering, from fundamentals to application. You'll learn how to integrate LLMs (Large Language Models) into your AI applications, as well as the necessary steps to ensure your applications are secure and private.

Skills Gained

- Understand the basics of generative AI and its applications
- Learn about different techniques and algorithms used in generative AI
- Develop skills to design and implement generative AI models
- Gain proficiency in evaluating and optimizing generative AI models
- Apply generative AI models to real-world problems

Who Can Benefit

Programmers, Software Engineers, Computer Scientists, Data Scientists, Data Engineers, Data Analysts.

Prerequisites

- Extensive prior Python development experience
- Core Python Data Science skills, including use of NumPy and Pandas
- Inferential statistics

Course Outline

Introduction

- Definition of LLMs (Large Language Models)
- Importance of LLMs in software engineering and data engineering
- Overview of the application of LLMs in software tools, data pipelines, and chatbots

Fine-tuning LLMs for software and data engineering tasks

- Understanding the training process
- Pretraining
- Fine-tuning
- Selecting appropriate datasets
- Domain-specific data (software engineering, data engineering)
- Data quality and diversity
- Techniques for fine-tuning
- Transfer learning
- Adaptive learning rates
- Regularization techniques

- Evaluating model performance
- Metrics for evaluation
- Identifying overfitting and underfitting

Integration of LLMs into existing software and data engineering tools

- Identifying suitable tools for LLM integration
- Integrated development environments (IDEs)
- Data processing and analysis tools
- Workflow automation platforms
- Adapting LLMs to specific tasks
- Task-specific fine-tuning
- Interface design
- Ensuring seamless interaction
- API integration
- Data flow management

Integrating LLMs into chatbot applications for software and data engineering use cases

- Chatbot architectures
- Retrieval-based chatbots
- Generative chatbots
- Enhancing chatbot performance with LLMs
- Natural language understanding
- Natural language generation
- Context-aware conversation handling
- Personalization and customization
- User profiling
- Adaptation to user preferences
- Ensuring security and privacy
- Data protection
- Anonymization techniques

Case studies and real-world applications in software and data engineering

- Examples of LLM integration in existing tools
- Successful chatbot applications using LLMs in software and data engineering contexts
- Lessons learned from practical applications

Future perspectives and challenges for software and data engineers

- The evolving landscape of LLMs
- Ethical considerations
- Potential limitations and mitigation strategies

Conclusion

- Recap of the importance and benefits of LLMs in software engineering and data engineering
- The future of LLMs in software tools, data pipelines, and chatbot applications