

Generative AI for Developers

Welcome to our transformative two-day workshop, "Generative AI for Developers," an immersive journey designed for developers, data scientists, and AI enthusiasts. Dive into the world of Large Language Models, mastering prompt engineering with hands-on experiences in ChatGPT, OpenAI API, and advanced prompting techniques. Explore the realms of Retrieval Augmented Generation, including practical applications with Bing Chat and building RAG pipelines. Uncover the exciting intersection of AI and vision, creating and reasoning about images with tools like DALL-E 3. The workshop has been designed to elevate your skills in data analysis and custom GPTs, offering insights into fine-tuning LLMs, addressing ethical considerations, and implementing AI guardrails. Join us for this comprehensive workshop to gain expertise, engage in practical learning, network with professionals, and stay at the forefront of AI innovation.

Format: Each module of this workshop is designed to include an overview and theory of a particular concept, followed by hands-on exercises using the ChatGPT UI and OpenAI API.

- Overview
- Hands-on exercises
 - Implementation through the ChatGPT user interface
 - Python Implementation in Jupyter Notebook / Colab

Please note: This course is designed for individuals with some background in programming and AI (or related fields), given its focus on advanced topics and practical applications.

Learning Outcomes

- Apply prompt engineering techniques in ChatGPT, explore OpenAI API functionalities, and implement various prompting methods to generate code efficiently.
- Construct a Retrieval Augmented Generation (RAG) pipeline, integrating semantic search and Bing Chat, to demonstrate practical applications and use-cases for RAG.
- Generate images using Bing Image Creator and DALL-E, and reason about images using GPT-4V, showcasing the versatility of generative AI in vision-related tasks.
- Utilize ChatGPT for advanced data analysis, create custom GPTs for specific applications, and implement interactive AI systems using the OpenAI Assistants API.
- Engage in hands-on fine-tuning exercises, comparing prompt engineering and fine-tuning, evaluating and debugging models, and addressing ethical considerations and biases in generative AI.

Day 1	
Module No.	Areas covered
1	<p>Introduction</p> <p>Overview</p> <ul style="list-style-type: none"> • Introduction to Large Language Models • Prompt engineering • Different prompting techniques <p>Hands-on</p>

	<ul style="list-style-type: none"> • Prompt engineering in ChatGPT • Introduction to OpenAI API (getting the API key, exploring different models, understanding API costs) • Implementing prompting techniques (chain of thought prompting, multi-stage prompts, etc.) • Function calling in OpenAI API • Code Generation
2	<p>Retrieval Augmented Generation</p> <p>Overview:</p> <ul style="list-style-type: none"> • What is retrieval augmented generation (RAG)? • Use-cases for RAG <p>Hands-on</p> <ul style="list-style-type: none"> • Bing Chat • RAG through ChatGPT • Embeddings • Semantic Search • Building the RAG pipeline using Langchain
3	<p>ChatGPT for Vision</p> <p>Overview</p> <ul style="list-style-type: none"> • Creating images • Reasoning about images <p>Hands-on</p> <ul style="list-style-type: none"> • Bing Image Creator / DALL-E 3 • OpenAI Image generation API (DALL-E 2, 3) • GPT-4V (GPT for Vision API)
Day 2	
Module No.	Areas covered
4	<p>Data Analysis and Custom GPTs</p> <p>Overview</p> <ul style="list-style-type: none"> • Data Analysis <p>Hands-on</p> <ul style="list-style-type: none"> • Advanced Data Analysis in ChatGPT • Creating Custom GPTs • OpenAI Assistants API

5	Fine-tuning Overview <ul style="list-style-type: none">• Introduction to fine-tuning• Prompt engineering vs Fine-tuning Hands-on <ul style="list-style-type: none">• Fine-tuning LLAMA 2• Evaluating and Debugging LLMs• Quantization and Low-Rank Adaptation
6	Limitations and Challenges Overview: <ul style="list-style-type: none">• Hallucinations• Fairness and Biases• Ethical Considerations Hands-on <ul style="list-style-type: none">• Adding Guardrails in LLMs