AI Bootcamp to Accelerate your Generative AI Skills

Who Should Attend?

1. The Forward-Thinking Data Analyst

- *Background:* Works with large datasets, performs data cleaning and reporting.
- *Goal:* Use NLP and generative AI to derive deeper insights, automate repetitive tasks, and enhance reporting with natural-language summaries.

2. The Aspiring AI Engineer

- *Background:* Familiar with Python and basic machine learning concepts.
- *Goal:* Master prompt engineering, fine-tune language models, and build end-to-end solutions that incorporate RAG for more accurate, context-aware responses.

3. The Tech-Savvy Consultant

- *Background:* Advises clients on technology adoption, change management, or operational efficiency.
- *Goal:* Gain hands-on practice in developing AI-driven case studies—enabling advanced client solutions, faster prototyping, and better strategic recommendations

Key Takeaways

- **Practical Skills:** Develop, deploy, and refine AI-driven solutions from the ground up.
- **Industry-Relevant Projects:** Build portfolio-ready prototypes, like a RAG-powered chatbot.
- **Custom Use Cases:** Apply your newfound skills to challenges directly related to your organization or field.

Overview of the Syllabus

Week	Topic	Lecture	Lab
	GenAI, LLMs, Prompts	**Duration: 2 hours** Generative AI Overview and Applications LLM Architectures, Capabilities, and Limitations Engineering effective prompts and types of prompts	**Duration: 3 hours** Use AI models. Create, Test, Refine prompts. Analyze LLM outputs.
2	**Document/Text Processing**	**Duration: 2.5 hours** NLP concepts, Sentiment Analyses Word Embedding principles (word2vec GloVe) NLP+ LLM Integration for data processing	**Duration: 2.5 hours** Explore NLTK spaCy Libraries Explore embeddings with data Build end-end NLP pipeline.
3	**RAGs**	**Duration: 2.5 hours** RAG principles and Architectures RAG + LLM for specificity and external knowledge RAG applications in industry	**Duration: 2.5 hours** Develop a RAG pipeline Explore RAG+LLM integrations Team discussions on RAGs
4	**Case Study** (Sample/ Personalized)	**Objective:** Develop a prototype chatbot that leverages Retrieval Augmented Generation (RAG) to answer customer inquiries by retrieving relevant information from a curated set of support documents (e.g., FAQs, product manuals, and troubleshooting guides). **Deliverable:** A functional prototype of a RAG-powered Q&A chatbot. **Design:** 1. Data Preparation: o Corpus: Provide a set of documents such as company FAQs, product documentation, and support guides. o Preprocessing: Use NLP techniques to clean and tokenize text, preparing it for embedding generation. 2. Embedding and Retrieval: o Word Embeddings: Generate embeddings for the documents using pre-trained models (e.g., Word2Vec, GloVe, or transformer-based embeddings). o Retrieval Mechanism: Implement a simple similarity search (e.g., cosine similarity) to identify the most relevant documents in response to a user query. 3. Prompt Engineering and Generation: o Contextual Prompt: Create a prompt template that incorporates the retrieved documents as context. o Response Generation: Use a pre-trained large language model to generate an answer based on the prompt and context. 4. Integration and Evaluation: o Prototype: Develop a simple interface (command-line or web-based) where users can input queries and receive generated responses. o Testing: Evaluate the system with various queries, refine prompt templates, and adjust retrieval parameters to improve accuracy and relevance. **Step-by-Step Implementation:** 1. Set up the environment, preprocess the document corpus, generate embeddings. 2. Develop, test the retrieval system that selects relevant documents for a query. 3. Integrate the retrieval output with a prompt for the language model and build the prototype interface. Conclude with group demonstrations and feedback	