

Building and Experimenting with GenAI Workshop

Motto: Making Gen AI and LLM your Academic Companion

Total Duration: ~ 2 hours

Instructors:

1. Sudharshana B - [Connect on LinkedIn](#)
{ Experienced in building AI apps with Next.js, OpenAI, and RAG pipelines, achieving high accuracy and retention. Led engineering teams with Agile practices to deliver impactful projects. }
2. Shrinidhi S - [Connect on LinkedIn](#)
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Objective:

Lead the GenAI revolution by getting **hands-on practice** with our gen-ai workshop and projects to prepare for the future.

What Makes AI "Generative"

Get all your doubts cleared by learning answers to all the “Wh” questions in our workshop:

- **What is Gen AI?**
- **Why is it useful?**
- **How is it being built?**
- **Where can Gen AI tools be used in daily work?**
- **Which are the most useful ones for an engineering student?**

Motto: Building & Making Gen AI Your Academic Companion

Prerequisites:

- A basic understanding of Python programming.
- Curiosity to learn and experiment with AI concepts.
- A Google account to use Google Colab—no need for complex setups, everything will be done online!

The key value here is that it's not just theory. This workshop teaches you all gen ai tools that will help you in your daily works boosting productivity. You will learn how to build a **production-ready document chat system (LexiChat) and a cold email generator that will help you in applying for internships and jobs** while understanding why each component works the way it does.

Instead of just **copying code**, you'll learn the fundamental concepts that will help you build and customize AI systems for various needs.

Agenda and Session Outline

1. Essential Tools for Making AI Your Study Companion & Basic Prompt Engineering

- Overview of all the best and popular tools for engineering students to stay updated and ahead.
- Helps students excel in their field of work by using AI as their personal assistant.

2. Core Machine Learning Concepts

- How computers understand and process text.
- **Key Topics:**
 - Converting words into mathematical vectors (embeddings).
 - The attention mechanism: how AI "focuses" on important parts of text.
 - Transformer architecture powering modern AI models.
 - Text Processing & NLP basics:
 - Tokenization and Embeddings.
 - Attention Mechanisms.
 - Transformers.
 - Similarity Measures.

3. Search & Retrieval Technology

- How search engines work (e.g., Google).
- Different ways to measure text similarity.

- Evolution from simple keyword matching to meaning-based search.
- Advanced Retrieval Models

4. RAG (Retrieval Augmented Generation)

- Why combining retrieval and generation improves AI responses.
- Breaking documents into chunks for better processing.
- Converting text into 1536-dimensional embeddings.
- Building a complete RAG pipeline.

5. Practical Implementation

- Setting up databases with **pgvector**.
 - Processing and storing documents efficiently.
 - Building a real chat system with RAG.
 - Scaling and optimizing for production.
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Hands-On Projects

LexiChat

- **Description:** A document-based chat system designed to answer user queries accurately by leveraging RAG principles.
- **Hands-On Learning:**
 - Understand how to process user queries and retrieve accurate responses from stored documents.
 - Learn how to implement embeddings and integrate a retrieval pipeline for high-quality outputs.
 - Focus on scaling and optimizing the system for production-ready deployment.

Cold Email Generator

- **Description:** An AI-powered generator for creating professional, impactful cold emails tailored to real-world scenarios.
- **Hands-On Learning:**
 - Gain insights into text generation principles and how AI builds responses.
 - Practice designing prompts for specific, high-quality email outputs.
 - Deploy and test the generator, gaining a deeper understanding of AI's application in professional communication.

Outcome:

By the end of this workshop, participants will:

1. Understand the core principles behind Generative AI and ML
2. Build and deploy a practical AI system.
3. Learn to leverage Gen AI tools to excel academically and professionally.
4. Roadmap to lead in AI & ML