Karthik Nair

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SKILLS & INTERESTS

- **Programming & Development**: Python, C++, Bash, FastAPI, Flask, RESTful APIs
- **Generative AI**: Prompt Engineering, Large Language Models (LLMs), LangChain, LangGraph, RAG, Multimodal Systems (Text, Voice)
- **Data Science**: Pandas, NumPy, Nvidia MatX, Matplotlib, Seaborn, Plotly, Scikit-learn, TensorFlow, PyTorch, spaCy, NLTK, OpenCV
- **Cloud & Data Engineering**: Google Cloud Platform (GCP), AWS, Azure, Docker, Kubernetes, CI/CD (GitHub Actions, Jenkins), Linux (RHEL, Debian), Data Pipelines, ETL/ELT, Apache Spark, Apache Beam, SQL, Firestore
- **Tools & Technologies**: Git, BeautifulSoup, Scrapy, Selenium, GitHub, Jupyter, VS Code, WeasyPrint, FFmpeg, Google Gemini
- **Soft Skills**: Client Communication, Technical Writing, Cross-functional Collaboration, Information Retrieval
- **Interests**: Open Source Contribution, Synthesizer, Calisthenics, Reading, Writing

EDUCATION

Vivekananda Institute of Professional Studies | Guru Gobind Singh Indraprastha University, New Delhi July 2021 - June 2024

Bachelor of Computer Applications 9.2 CGPA

WORK EXPERIENCE

AI Engineer Aug 2024–Present

Tata Consultancy Services - Noida, Uttar Pradesh

Data Engineering Solutions

- **Led the transition of 3 AI/Data Engineering projects** from PoC to production for a major U.S. pharmaceutical client, including a **data optimisation pipeline that boosted processing speed by 60%.** Enabled 200+ researchers to access real-time analytics with zero downtime.

Automating Workbook Generation for Clinical Trials

- Designed algorithmic solutions using **openpyxl** to automate the creation of complex, interconnected workbooks, **improving data engineering efficiency and cutting manual effort by 95% (from ~5 minutes to under 15 seconds per workbook) with 100% accuracy**.

Process Automation solutions

- **Automated impact analysis** across upstream, core, and downstream systems for a leading U.S. pharmaceutical client. **Developed Generative AI workflows** to identify system impacts and generate summary reports using data extracted from ServiceNow and Veeva QualityDocs. **Reverse-engineered complex DOCX structures** to enhance automation accuracy and efficiency.

AI Systems for Data Insights and Workflow Optimization

- Engineered an AI system for large pharma & clinical datasets that generates **real-time code to produce graphs** and answer statistical queries using **LLM-optimised schemas** that **cut analysis time by 90%**. Integrated into the client's SageMaker setup as **FastAPI** endpoints.
- Built a conversational **Retrieval-Augmented Generation (RAG)** system using **LangChain** and LLMs over the client's documentation and codebase, streamlining information retrieval for everyone involved.
- Assisted in the development of an **end-to-end transcription system** that uses **Azure OpenAI Whisper**, **FFmpeg**, and **GPT-4o** with **95%+ accuracy** for clinical audio and automated the conversion of speech to structured documents with real-time summarisation and reference extraction.
- Developed a **reusable and scalable Python package** to seamlessly **integrate AI capabilities**, including multimodal support and diverse LLMs, enabling rapid adoption of advanced AI features across teams.

R-to-Python Migration & API Development

- Assisted in the partial migration of an R codebase to Python to improve maintainability, performance, and team accessibility. Developed FastAPI endpoints to **expose core functionalities as scalable web services**.

AWARDS

- Best Team Award - for major cost savings and efficiency improvements in AI solutions 2025
- 2× TCS Technical Excellence Award – for impactful contributions to enterprise AI systems 2025
- Bug Bounty Award from Google Buganizer Android 12/13 2021