

Karthik Nair

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SKILLS

- 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

WORK EXPERIENCE

AI Engineer, Tata Consultancy Services

Aug 2024–Present

PoC to Production Deployment

- **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.

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.

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**.

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**.

PERSONAL PROJECTS

Personal Finance Tool

July 2025 - Present

- Building a Generative AI (Gemini) assisted personal finance tool that parses bank statements, categorises expenses, and visualises spending trends. Integrated **smart caching and regex-based heuristics** to **reduce inference costs over time**. Focuses on **sustainable AI** and data privacy by minimising data transfer and processing overhead.

Markdown-resume

- Markdown-based resume generator using CSS and WeasyPrint, designed for customization, speed, and professional output. **This resume was created using it.**

AWARDS

- 2× TCS Technical Excellence Award – for impactful contributions to enterprise AI systems

2025

EDUCATION

Indira Gandhi National Open University, New Delhi

January 2025 - Present

Master of Computer Applications

Vivekananda Institute of Professional Studies | Guru Gobind Singh Indraprastha University, New Delhi

July 2021 - June 2024

Bachelor of Computer Applications (Data Science & Analytics) | 9.2 CGPA

LANGUAGES

- English, Hindi, Malayalam (Professional Proficiency), Tamil (Limited Working Proficiency)