

Karthik Nair

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SKILLS

- Programming and scripting languages (Python, C++, Bash)
- Generative AI (Prompt Engineering, Large Language Models, LangChain, LangGraph, Retrieval-Augmented Generation)
- Backend Development (FastAPI, Flask), Database Management (SQL, Firestore), Data Engineering and Analytics
- Machine Learning (Scikit-learn, TensorFlow, PyTorch), Natural Language Processing (spaCy, NLTK), Computer Vision (OpenCV)
- Cloud Platforms (Azure, AWS, Vercel, Render), DevOps (CI/CD, Docker, Kubernetes, Jenkins), Version Control (Git), Linux (RHEL, Debian)
- Data Visualisation (Matplotlib, Seaborn, Plotly), Data Processing (Pandas, NumPy), Web Scraping (BeautifulSoup, Scrapy)
- Content Writing, Video Editing (DaVinci Resolve), Photography, Digital Marketing

WORK EXPERIENCE

AI Engineer, Tata Consultancy Services

Aug 2024–Present

PoC Development and Production Transition

- Transitioned multiple AI and Data Engineering projects from **proof of concept to MVP and eventual production**, enhancing data processing and analysis capabilities for a major U.S. pharmaceutical client.

AI Systems for Data Insights and Workflow Optimization

- Engineered an AI system that processes **pharmaceutical and clinical datasets**, optimises schemas for **LLMs**, and auto-generates custom analytics scripts. The system **reduced data analysis and visualisation efforts by 90%**, accelerating insights and supporting drug discovery. Developed **FastAPI endpoints** to integrate it into the client's existing **SageMaker infrastructure**.
- 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.
- **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 current and future projects by multiple 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 an AI-powered personal finance tool that parses bank statements, auto-categorises expenses using Google Gemini, 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

- **2x Technical Excellence Award from TCS** for outstanding contributions to AI projects 2025
- **Bug Bounty Award from Google Buganizer Android 12/13** 2021

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

- Professional Proficiency: English, Hindi, Malayalam
- Limited Working Proficiency: Tamil