SUBASHJI NATARAJAN - AI/ML PORTFOLIO

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Professional Objective:

A passionate AI and Backend developer with hands-on experience in building real-world GenAI applications in the BFSI domain, deep learning projects in healthcare, and satellite imagery analysis. I combine data-driven thinking with practical engineering skills to build AI-powered solutions that solve real problems.

Tech Stack/Skills:

- Programming Languages: Python, Java,
- Area of Interest: Machine Learning, Deep Learning, Gen AI.
- Framework: TensorFlow, Lang Chain, Flask, Spring.
- Coding Platform: VS Code, Google Colab, Anaconda.
- LLM & AI Platform: OpenAI GPT (ChatGPT, GPT-4 APIs), Google Gemini API.

Projects:

- GEN-AI BASED BFSI PLATFORM:

Mar 2025 – Present

  - Currently building a **BFSI-focused platform** for a **TechMahindra** hackathon, featuring companions for invoice/bank statement analysis and savings advice. Contributing as a backend developer with responsibilities including AI integration, **Flask-based** backend development, and planning deployment using **AWS** and **Docker.**
  - Features: Gen-AI based Q&A**, Aadhaar/PAN** verification, automated email reports, and financial insights dashboard.
  - **Tech**: React, Flask, FAISS, LangChain, Gemini API, AWS, SMTP.
  - **Impact**: 50% reduction in manual analysis time, 30% increase in user satisfaction.

- PDF CHATBOT USING GEMINI(API):

  JAN 2024 – JUNE 2024

  - Independently built an intelligent PDF chatbot as part of my final year thesis, aimed at simplifying research work.
  - Designed to answer questions directly from uploaded academic papers, helping users avoid manual reading.
  - Personally, used it to extract relevant content from thesis documents, reducing research time significantly.
  - Utilized **Gemini API** for natural language understanding and **LangChain** for prompt and response handling.
  - Integrated **pdfplumber**, **PyPDF2**, and **FAISS** for PDF parsing, chunking, and vector-based retrieval.
  - Developed with **Flask** (backend) and **HTML/CSS/JS** (frontend), demonstrating full-stack implementation of LLMs in research.

- ANOMALY DETECTION IN SENTINEL-2 MULTISPECTRAL IMAGERY:

  AUG 2023 – MAR 2024

  - Collaborated as part of a 4-member team on detecting land use anomalies using Sentinel-2 multispectral imagery in the Tirupur district of Tamil Nadu.
  - Took ownership of the **backend development**, implementing deep learning models including **Convolutional Autoencoders (CAE)** and **Variational Autoencoders (VAE)** for anomaly detection.
  - Designed attention mechanisms and fine-tuned model hyperparameters to improve dimensionality reduction and reconstruction accuracy.
  - The team conducted **field surveys** to collect ground-truth data and validated clustered anomaly regions using KML shapefiles in Google Earth.
  - We compared multiple models using evaluation metrics like reconstruction loss, silhouette scores, and clustering quality.
  - **Tech Stack & Platforms:** Python, TensorFlow, Google Earth, NumPy, Scikit-learn, Matplotlib, Sentinel-2 imagery.
  - Published a conference paper titled **"Unsupervised Land Use Land Cover Mapping of Sentinel-2 Data Using Convolutional Autoencoders"** in the IEEE Conference Proceedings (2024) at NIT Meghalaya, presenting a deep learning-based unsupervised approach for accurate land cover classification from multi-spectral satellite imagery.

Certifications:

Course Title	Platform
The Python Bible (Everything you need to Program in Python)	Udemy
SQL for Beginners	Udemy
Agile Fundamentals	Udemy
Deep Learning Models and Introduction of Raspberry pi	IIT Palakkad
Introduction To Gen AI	Google Cloud
Google Cloud Computing Foundations	Google Cloud
Generative AI Fundamentals	Google Cloud
Cognizant-AI Job Simulation	Forage
AI Whit Belt	NAD(TechM)

Why I Believe I'm the Right Fit for This AI Role:

1. I published a paper in **IEEE Conference Proceedings (2024)** at NIT Meghalaya on using convolutional autoencoders for land use mapping with Sentinel-2 data. It was fully unsupervised and showed my understanding of deep learning with real-world satellite data.
2. I've worked on multiple AI projects like **PDF chatbots**, **document verification** (Aadhaar/PAN), and **invoice processing tools** using tools like Flask, Gemini, LangChain, FAISS, and OpenCV. I built them from scratch and handled both backend logic and model integration.
3. I've been part of **team projects** where I actively contributed, shared ideas, and made sure things were **delivered on time**. I always try to keep communication clear and help others when needed.
4. I focus a lot on **writing clean, working code** and make sure everything is tested properly. I care about the **quality of what I build**, especially when it's handling sensitive or important data.
5. I'm comfortable working across both **frontend (Angular) and backend (Python/Flask)**, and I'm quick to pick up new tools or frameworks. I like solving problems with AI and building things that actually work in real scenarios.