PRABHUDAYAL VAISHNAV

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⌂ Portfolio Website

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WORK EXPERIENCE

• **Research Internship : ESIEA Paris, France (Remote)**   *January 2025 - June 2025*

Completed research on "Complex Human Emotion Detection Using YOLO11" project.

- Enabled real-time detection of 22 discrete human emotions by training on the CFEE dataset using YOLO11.
- Fine-tuned YOLO11 (COCO-pretrained) using transfer learning for real-time emotion detection.

PROJECTS

Grand Plaza: Voice AI Hotel Concierge System   *FastAPI, LangGraph, Pipecat, WebRTC, ChromaD*

Built a full-stack voice AI concierge achieving 88% accuracy in menu query understanding

- Architected a multi-strategy RAG system achieving 88% query accuracy, outperforming naive RAG by 4.8% through semantic search, reranking, and Chain-of-Thought reasoning.
- Implemented LangGraph-based agent workflows with 5+ specialized nodes, reducing conversation errors by 15% through structured intent classification and validation.
- Integrated real-time multi-modal pipeline processing 100+ concurrent voice sessions with sub-200ms latency using ElevenLabs TTS, Deepgram STT, and Tavus video avatars.
- Built WebRTC communication system with Pipecat and Daily.co, supporting seamless voice interactions with 99.5% uptime across 3 production iterations.

Career Scout: Voice AI-Powered Job Search Assistant   *Next.js, React, Supabase, TypeScript, MCP Server*

Developed a full-stack Voice AI Career Coach for smart job search

- Architected a custom MCP server with 3 tools: *Intelligent Job Search, Company Analysis, and Web Search*.
- Integrated custom scoring logic to match user skills with confidence percentages.
- Built a responsive, Supabase-authenticated frontend with React hooks and Tailwind CSS, reducing voice interaction latency by 40%.

• **The AI Scientist: Sakana AI**   *Python, LLMs, Transformers, Git*

Contributed to Sakana AI's Open Source project to automate scientific research.

- Added 8 open-source language models, achieving a 75% reduction in generation costs.
- Adapted the project for T4 GPU support, reducing reliance on high-end GPUs like H100/A100.
- Co-authored a paper: "*Exploring Style Transfer with Small Character-Level Transformers*" using Qwen2.5(72B).

• **Development of Python Module: XS**   *Python, Ngrok, API Creation*

Published a pip package to expose inference endpoints for open-source LLMs.

- Released a Python package to create accessible endpoints for over 99% of Hugging Face-hosted LLMs.
- Leveraged Ngrok to tunnel requests from localhost to the cloud securely.

TECHNICAL SKILLS

- **Programming Languages:**
  Python, Next.js, React, JavaScript, C, C++, SQL, Matlab, R
- **AI and LLM Tools/Frameworks:**
  LangGraph, LangChain, LlamaIndex, Ollama, HuggingFace Transformers, PyTorch, TensorFlow, Pipecat
- **Data Analysis and Visualization Tools:**
  Pandas, Numpy, Seaborn, Power BI
- **Miscellaneous Skills:**
  Linux, MacOS, Competitive Programming
- **Soft Skills:**
  Leadership, Communication, Problem Solving

RELEVANT COURSEWORK

- **Core Computer Science:**
  Object Oriented Programming, Database Management System, Computer Architecture Organization, Computer Network, Operating System, Data Structures and Algorithms

- **Artificial Intelligence and Data Science:**
  Artificial Intelligence, Data Visualization, Pattern Recognition and Machine Learning, Natural Language Processing

- **Mathematics and Theoretical Foundations:**
  Theory of Computation, Cryptography and Network Security

ACHIEVEMENTS

Indian Institute of Management (Data Analyst) Hackathon Winner, 2024   *2024*

8 hour long Hackathon, organized by InFED at Nagpur on 12 November 2024

- Won 1st place by presenting a solution to the Startup's Problem: **AI Product Comparison**.
- Implemented the Deep-Reserach & generated a report on **AI Product Comparison (22-page report)** using a Python-based AI Agent with Tavily Search, significantly reducing manual effort and time by 90%.

EDUCATION

Bachelors of Technology (Hons.) CSE Data Science   *2022-Present*

(6th Semester) *Chhattisgarh Swami Vivekanand Technical University, Bhilai, 491107*   CGPA : 7.2/10

- Research Internship at ESIEA Paris, France (Remote) under the project "Complex Human Emotion detection with Ultralytics YOLO11" - Completed June 2025.