

NAVYA SIVA RAJ

Software Engineer | Python, TypeScript, Node.js, REST APIs, AWS

navyasraj2003@gmail.com (832) 724-9256 linkedin.com/in/navya-s-raj/ github.com/navyasraj02 navyasraj02.github.io

WORK EXPERIENCE

Application Developer | University of Houston – Hewlett Packard Enterprise Data Science Institute Jun 2025 – Present

- Design, develop, test, and maintain responsive web application features using Vue.js, TypeScript, HTML5, CSS3, Node.js, and MongoDB for a university platform serving more than 1,100 students.
- Automated semester report generation from MongoDB data, reducing processing time from 30–45 minutes to under one minute.
- Led the development of a consent-based public sharing feature, enabling 1,100+ students to securely share profiles and projects.
- Developed an automated MongoDB backup manager that schedules database backups every two weeks and introduced centralized error handling, strengthening recovery readiness and application reliability.
- Deployed a production full-stack application behind NGINX on Jelastic/Reclaim Cloud, supporting 1,100+ users.

Research Assistant | University of Houston, Sugar Land Oct 2024 – Jul 2025

- Engineered Python-based preprocessing pipelines to collect, clean, and standardize 10,000+ social media and forum posts gathered over six months.
- Packaged preprocessing logic into reusable Python workflows that transformed raw social media content into analysis-ready datasets for downstream NLP.

Machine Learning Intern | Indian Institute of Information Technology, Kottayam (IIITK) Dec 2021 – Apr 2022

- Collaborated with six interns to build Python-based ML workflows covering data preprocessing, visualization, model training, and evaluation using Pandas, NumPy, and Scikit-learn.

TECHNICAL SKILLS

- **Programming:** Python, TypeScript, JavaScript, Java, SQL, C++
- **Backend & APIs:** Node.js, Express.js, FastAPI, Flask, Django, REST APIs
- **Frontend:** React, Vue.js, HTML5, CSS3
- **Databases:** MongoDB, MySQL
- **Cloud & DevOps:** AWS (EC2, S3), Docker, NGINX, Git, Linux
- **Testing & Applied AI:** Unit Testing, Playwright, LangGraph, Microsoft Agent Framework (MAF), OpenAI API (GPT-4o), Tool Calling

ACADEMIC PROJECT EXPERIENCE

Agentic Moodle LMS Automation System | University of Houston Jan 2026 – Present

- Developed an instructor-facing agentic LMS assistant that analyzes assignment context, identifies pending tasks, and drafts rubric-aligned feedback for instructor approval.
- Orchestrated stateful multi-agent workflows using LangGraph, MAF, and GPT-4o tool calling, implementing session management, tool execution, and adaptive page interactions.
- Built an asynchronous Playwright automation layer for authenticated LMS navigation, page extraction, and browser actions; containerized Moodle with Docker and traced agent execution using LangSmith.

BioVault - Biometric Authentication System | RIT, Kottayam Sep 2023 – Apr 2024

- Designed a secure biometric authentication system with a team of 4, distributing encrypted biometric templates across multiple servers to ensure fault-tolerant data protection.
- Implemented Flask REST APIs and MongoDB data models for biometric enrollment, processing, and retrieval.
- Integrated image processing pipelines (OpenCV) for fingerprint feature extraction.

Traditional ML vs. Self-Hosted LLM Benchmarking on AWS EC2 | University of Houston Jan 2026 – Feb 2026

- Benchmarked TF-IDF/Logistic Regression and quantized Llama 3.2 3B inference across six AWS EC2 configurations, comparing latency, throughput, and cost under varying batch sizes and concurrency levels.
- Traditional ML achieved 140–160 ms average latency and up to 65 texts/second; c7g.xlarge delivered the best self-hosted LLM cost-performance at \$2.622 per 1M tokens.

Pseudostem Weevil Detector | RIT, Kottayam Mar 2023 – Jun 2023

- Processed 6,000 field-recorded audio samples into Mel spectrograms using FFT-based signal processing and trained a CNN that achieved 98% held-out test accuracy.
- Embedded the CNN model into a Python web application and deployed it on PythonAnywhere for real-time pest detection.

EDUCATION

Master of Science, Computer Science · GPA: 3.8/4.0 Aug 2024 – May 2026
University of Houston, Houston, TX

Bachelor of Technology, Computer Science and Engineering (Honors) · GPA: 9.57/10.0 Nov 2020 – Jun 2024
Kerala Technological University (KTU), Rajiv Gandhi Institute of Technology (RIT), Kerala, India