

# Ritvik Mahapatra

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## EDUCATION

University of Maryland

Expected Graduation: December 2026

Bachelor of Science, Computer Science | Minor in Economics | Dean's List

Relevant Coursework: Data Science, Elementary Theory of Computation, Machine Learning, Human-Computer Interaction

## EXPERIENCE

Minnodi LLC

Frederick, Maryland

*AI/ML Engineer Intern*

*June 2025- Present*

- Designed a natural language-driven assistant for users with disabilities to complete complex online tasks, using **LangChain**, **Browser Use**, and **Gemini** agents to automate **16–28 step** workflows across **~20 sites** like Amazon, Expedia, and UberEats.
- Developed task planning strategies to dynamically identify and interact with UI elements; tuned agent behaviors for **~30 different** task types including flight booking, food ordering, and multi-item cart addition, decreasing average steps by **~45%**.
- Implemented a planner agent within the assistant's multi-agent architecture to coordinate Browser Use and Gemini agents, boosting overall task throughput by **20%**.
- Integrated **Monte Carlo Tree Search**-based **reinforcement learning** into agent planning, enabling adaptive long-horizon task execution and improving task success rates on multi-page workflows by **~12%**.
- Collaborated on frontend integration using **React.js** and **ElevenLabs TTS** for accessibility and improved user experience.

Booz-Allen Hamilton – App Dev Club

College Park, Maryland

*Full Stack Developer*

*January 2025-May 2025*

- Collaborated on a **10-person** Agile team to architect a containerized **TypeScript + Next.js** application that automates insurance policy auditing, saving Booz-Allen Hamilton an estimated **\$50,000**.
- Designed and implemented backend search and filter APIs leveraging **PostgreSQL** full-text search, enabling efficient partial and fuzzy text matching for rapid policy retrieval and improved user experience.
- Engineered an OCR pipeline with **Tesseract-OCR** and **OpenCV**, preprocessing scanned insurance documents and extracting structured data with high accuracy for downstream processing.
- Built a scalable, event-driven data processing pipeline using **AWS Lambda**, **EC2**, **SQS**, and **S3 buckets**, orchestrating the queuing of **500+** sample policy documents from an **RDS instance** for automated extraction, storage, and summarization.
- Presented our application in a final demo to **~30 Booz-Allen employees** across underwriting, IT, and executive teams, gathering cross-functional feedback that directly shaped our last sprint's feature set.

## PROJECTS & ACTIVITIES

Personal Portfolio Site:

[Github Repository](#)

[Angular](#) | [TypeScript](#) | [FastAPI](#) | [LangChain](#) | [ChromaDB](#) | [Tailwind](#)

- Built and deployed an **Angular**-based portfolio site, featuring an interactive timeline of **17** technical projects and experiences.
- Built VibeMatch, a **music recommendation** feature that compares 5 user-input artists with my music taste using fine-tuned embeddings and recommends **10 k-NN**-based song matches from a custom dataset, with metadata via the **Spotify API**.
- Trained a **RAG** chatbot on my resume and projects, parallelizing embedding & bot calls to cut query latency by **~60%**.

SQuAD QA Analysis:

[Github Repository](#)

[FAISS](#) | [BM25](#) | [BERT](#) | [GPT](#) | [LangChain](#)

- Engineered an end-to-end **RAG-A** pipeline with over **500 Wikipedia topics** by combining **DPR/FAISS** and **BM25 hybrid retrieval** with cross-encoder re-ranking.
- Built **BERT-large** extractive and **GPT-3.5** generative QA systems with answer aggregation, achieving **>65% EM**.
- Automated multi-metric evaluation (EM, F1, recall, relevancy, faithfulness) using **LangChain** & **FAISS**.

VoiceVilla (Voice Activated Real Estate Agent)

[Github Repository](#)

[React.js](#) | [Node.js](#) | [AWS Lex](#) | [AWS Lambda](#)

- Developed a **React.js** platform for users to simulate calls with real-estate agents and see listings for **~200k** U.S. properties.
- Integrated **AWS Lex** and **Polly** with **AWS Lambda** to provide voice transcription and conversational chatbot capabilities.
- Implemented retrieval from the **Zillow API**, optimizing response times and ensuring scalability for property searches.

GiftLink

[Github Repository](#)

[React.js](#) | [Node.js](#) | [Express](#) | [MongoDB](#) | [Kubernetes](#)

- Built a full-stack **MERN** app connecting donors and seekers, with secure **JWT** authentication and dynamic user registration.
- Developed **RESTful** microservices and **NoSQL** schemas to manage listings, profiles, and matchmaking, also incorporating a sentiment-analysis endpoint using the **Natural** library to gauge user feedback.
- Containerized and deployed the app using **Docker** and **Kubernetes** for scalable orchestration and production-readiness.

## SKILLS

**Programming Languages:** Python, Java, Dart, JavaScript, SQL, C, R

**Frameworks/Databases/Tools:** Flutter, React.js, Next.js, Angular, FastAPI, Flask, Node.js, Express, PostgreSQL, SQLite, SQLAlchemy, OpenCV, MongoDB, Git, Linux, Lambda, EC2, SQS, S3 Buckets, RDS, Ollama, BERT, LangChain, NLTK

**Certifications:** IBM Full Stack Developer Certification (React.js, Node.js, MongoDB, Docker, Kubernetes, DevOps, Agile/Scrum Methodologies, Microservices courses), Minnodi LLC Computer Vision, NLP, and AI Agent Course