

# Raj Madhu

Bellevue, WA, 98007 | [raj.madhu0406@gmail.com](mailto:raj.madhu0406@gmail.com) | +1-984-999-5404 | [github.com/rajmadhu0406/](https://github.com/rajmadhu0406/) | [linkedin.com/in/raj-madhu/](https://linkedin.com/in/raj-madhu/)

## EDUCATION

### North Carolina State University

Raleigh, NC

Master of Science in Computer Science (Thesis), GPA: 3.9/4.0

08/2023 – 05/2025

Coursework: Data Structures and Algorithms, Cloud Computing, Object-Oriented Design and Development, Automated Learning and Data Analysis, Human-Computer Interaction, Building Games with AI, Neural Network and Deep Learning, Thesis Research, Computer Networks

### Indus University

Ahmedabad, India

Bachelor of Technology in Computer Engineering, GPA: 9.63/10.00

06/2019 – 06/2023

## TECHNICAL SKILLS

**Programming:** Java, Python, TypeScript, C++, Ruby

**Cloud & DevOps:** AWS, Azure, Docker, Kubernetes, Jenkins, Ansible, Terraform, Nginx

**Databases & Big Data:** PostgreSQL, MySQL, Redis, DynamoDB, Kafka, Airflow, Hadoop, Spark, Elasticsearch

**ML & AI:** PyTorch, TensorFlow, LangChain, MLFlow, Ray, Pinecone, ChromaDB, Hugging Face, vLLM, RAG, OpenCV

**Others:** REST APIs, gRPC, GraphQL, Swagger, Jira, Agile SDLC, JUnit, Mockito, PyTest, TDD, TCP/IP

## EXPERIENCE

### North Carolina State University

Raleigh, NC

Software Engineer

02/2024 – 03/2025

- Pioneered a Software-Virtualized Quantum Network (VQN) using Python, FastAPI, PyTest, React, Redis, SQLAlchemy and MySQL, enabling multi-tenant access to entangled photon resources through cloud-native architecture, reducing local server load by 80%.
- Achieved a 36% boost in fair allocation of limited Quantum resources by defining Quality of Service and using Linear Programming.
- Delivered a 75% improvement in deployment time by automating using Azure Kubernetes Service (AKS) and GitHub Actions CI/CD.
- Simulated high QPS using Locust load testing & Kubernetes HPA for 1,000+ concurrent users, resulting in 47% drop in latency

### Salesken AI

Bangalore, India

Software Engineer Intern

01/2023 – 04/2023

- Engineered the Centralized Task Management Microservice with Java, Spring Boot and PostgreSQL (5M+ rows), eliminating 95% of duplicated tasks and cutting storage cost by 30%.
- Contributed to 12+ integration modules across 3 teams to build a robust LLM pipeline for audio & video calls analysis and ASR.
- Achieved 80% reduction in data loss by integrating shutdown hooks to persist system state in Redis, enabling recovery on restart.
- Boosted query performance by 25% through Elasticsearch migration and semantic search integration.

### Neerx

Ahmedabad, India

Software Developer Intern

06/2022 – 10/2022

- Developed RestAPIs for agriculture IoT using Spring Boot, AWS, MongoDB, and React, following *Agile SDLC principles*.
- Architected the notification system leveraging Kafka and AWS SNS, increasing user engagement by 78%.
- Devised functions and algorithms to identify diseases and deficiency of nutrients in plants by leveraging data collected from the IoT.

## PROJECTS

### GenAI Book Recommender (NLP, RAG, LangChain, ChromaDB, OpenAI, Pandas, HuggingFace, Transformer, Gradio)

- Developed a context aware book recommender by leveraging OpenAI embeddings & LangChain, enabling personalized suggestions.
- Enhanced search accuracy by 40% by utilizing Vector DB to retrieve high-dimensional book embeddings vectors based on user input.
- Built an interactive dashboard, allowing users to receive explainable recommendations, boosting engagement & usability by 65%.

### Amazon Product Reviews ETL & Analytics (Distributed System, Hadoop, Spark, MapReduce, Kubernetes, NetworkX)

- Designed and orchestrated a distributed ETL pipeline on Kubernetes cluster to process and analyze 570M+ Amazon product reviews.
- Reduced query latency by 60% and decreased storage by 50% through Apache Iceberg partitioning and Parquet data compression.
- Utilized Apache Airflow to automate ETL workflows, enabling modular orchestration of data ingestion and transformation to HDFS.

### Google Docs Clone (DevOps, Python, FastAPI, GitHub CI/CD, AWS DynamoDB, Terraform, Ansible, Docker, ReactJS)

- Enabled cloud-based document collaboration for 1000+ concurrent users via WebSocket connections, enabling real-time updates.
- Established a CI/CD pipeline to automate building and deploying Docker images to AWS ECR, cutting deployment time by 80%.
- Managed AWS EC2 infrastructure using Ansible & Terraform for reproducibility and implemented test automation using pytest

## PUBLICATIONS AND INVOLVEMENT

- A Virtual Quantum Network Prototype for Open Access, IEEE Conference on Network Function Virtualization and Software Defined Networks (IEEE NFV-SDN), Under Review, July 2025.
- Secured 66th National Rank out of 12000+ participating teams, International Collegiate Programming Contest (ICPC).
- Top 10 finalists in the 3-Minute Thesis Competition organized by RedHat and North Carolina State University.
- Nvidia Certification: Getting Started with Deep Learning.