

ASHWATH RAJ MULAKALAPALLI

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Education

SRM University AP
B.Tech Computer Science Engineering
CGPA: 9.78 / 10.0
Relevant Coursework:

India, AP
2025-present

- Data Structures & Algorithms (Studied independently beyond the university curriculum)
- Linear Algebra (MIT OpenCourseWare; studied independently beyond the university curriculum)
- Optimization Concepts

Technical Skills

- **Languages:** Python, C, C++, Java, C#, SQL, JavaScript (Basic), HTML, CSS, Tailwind CSS, React (Basic)
- **AI / Machine Learning:** XGBoost, Random Forest, Natural Language Processing (NLP), OCR, Information Retrieval, Semantic Search, Embeddings, Prompt Engineering
- **LLM Engineering:** Retrieval-Augmented Generation (RAG), Local LLM Deployment, Context Validation Pipelines, Structured Retrieval Systems, Document Intelligence, Streaming LLM Architectures, Agent Workflow Design
- **Systems & Backend:** REST APIs, Threading, TCP Sockets, WebSockets, Client-Server Applications, Concurrent Processing, System Design
- **Databases:** SQLite, MySQL
- **Quantum Technologies:** Qiskit, BB84, Quantum Key Distribution (QKD), Quantum Random Number Generation (QRNG), Superdense Coding, QAOA Concepts
- **Tools:** Linux (Ubuntu), Git, GitHub, IBM Quantum Composer, OCR Pipelines, vs code, antigravity-CLI, codex, claud-code, cursor, repl.it.

Experience

RURO (Ruminants & Robots) — GOPIKA Initiative | 2025
Program Development Intern

Vizag, Andhra Pradesh
Dec 2025 – Jan 2026

- Architected and developed the first functional GOPIKA prototype for AI-powered agricultural decision support.
- Built multimodal AI pipelines integrating RAG, LLM inference, OCR, avatar rendering, subtitle generation, and execution monitoring.
- Engineered deterministic retrieval, observability, and validation systems with context grounding, fallback strategies, runtime diagnostics, and adversarial testing.
- Contributed to architecture reviews, deployment planning, stakeholder presentations, and multimodal integrations across CCTV, GPS, livestock, and operational datasets.

GYTWorkz Technologies(Gets You There) | 2026
Software Development Intern

hyderabad, telangana
Jun 2026 – Aug 2026

- Developed self-evolving AI agent architectures capable of continuously expanding organizational knowledge and improving decision-making workflows.
- Built an Agent Harness framework for orchestrating, evaluating, and monitoring autonomous agent behavior across enterprise use cases.
- Designed intelligent workforce-assistance systems enabling optimized task allocation through organizational knowledge modeling and agent-driven reasoning.
- Implemented knowledge-ingestion and retrieval pipelines allowing agents to learn company structure, staff capabilities, workflows, and operational context.

RESEARCH EXPERIENCE

Machine Learning Driven Predictive Modeling and Optimization in Biogas Systems
Co-Author — ICML-ALGO 2025

- Developed ANN, Random Forest, SVM, and XGBoost models for predictive biogas system analysis.
- Applied GA, NSGA-II, and Pareto-front optimization for multi-objective decision modeling and yield trade-off evaluation.
- Presented findings on model optimization and validation using noisy real-world datasets at ICML-ALGO

Achievements

- Solved **250+ LeetCode Problems** Maintained a **145-Day Coding Streak**
- Finalist — IIIT Nagpur Quantum Computing Hackathon
- Semifinalist — Amaravati Quantum Valley Hackathon
- Best Design Award — My1stHack
- 1st Runner-Up — Resident Evil Analytical Challenge
- Participated in **16+ National-Level Hackathons**

Experience

Legal Documents Démystifier Team-Lead	Gen AI Hackathon 2025 Google
- Built an AI-powered document intelligence system capable of processing PDFs, scanned documents, images, and raw text. - Implemented OCR extraction, document summarization, entity extraction, clause identification, and risk analysis. - Generated structured explanations and visual insights to improve legal document accessibility. - Combined NLP techniques with document-processing pipelines to reduce cognitive complexity.	
AI-Based Cost Estimation System Team-Lead	Road Safety Hackathon IIT Madras
- Developed a retrieval-driven system converting road safety reports into explainable engineering cost estimates. - Mapped interventions to IRC standards using semantic retrieval and clause-level matching. - Generated quantity estimates and itemized reports through structured reasoning pipelines. - Focused on interpretability, traceability, and engineering compliance.	
Content OS — AI-Native Content Infrastructure Team-Lead Best Design Award	Vibecraft 2025 SRM AP
- Built ingestion and preprocessing pipelines supporting documents, URLs, images, and unstructured content. - Implemented OCR extraction, normalization, metadata enrichment, confidence scoring, and content validation. - Designed a validation-aware architecture improving downstream AI-generation reliability. - Optimized processing under strict memory and infrastructure constraints.	
MindSpace — AI Wellness Companion Position Title	MY FIRST HACK SRM AP
- Led development of an AI-powered mental wellness platform emphasizing context-aware interactions and conversational continuity. - Designed memory-aware conversation flows, modular summarization, and response-validation mechanisms. - Directed product strategy, UX decisions, and final technical presentations. - Awarded Best Design for usability, product thinking, and user-centered experience.	
Q-AERO — Distributed Quantum Workload System Team-Lead	QC Square SRM AP
- Designed an orchestrator-worker architecture enabling distributed execution of quantum workloads. - Implemented workload decomposition, node coordination, and cross-platform execution strategies. - Integrated QAOA-inspired optimization workflows and BB84 communication simulations. - Utilized TCP/WebSocket communication for distributed workload synchronization.	
Quantum Random Number Generator (QRNG) Team Lead Finalist	Quantum Computing Hackathon IIIT Nagpur
- Built a Qiskit-based simulation framework generating auditable quantum entropy streams. - Designed an API-driven workflow producing verifiable random outputs and execution logs. - Explored applications in fairness-sensitive and security-sensitive systems.	
Quantum Communication Simulator Lead developer Semifinalist	Vibecraft 2025 SRM AP
- Simulated an end-to-end quantum communication pipeline using Quantum Key Distribution (QKD) and Superdense Coding. - Demonstrated entanglement-based key exchange and secure communication workflows. - Built an interactive communication interface integrated with Qiskit simulations.	

LEADERSHIP, SPEAKING & ENTREPRENEURSHIP

Leadership, Speaking & Entrepreneurship

- Delivered invited talks on quantum computing and emerging technologies to **700+ students**, simplifying complex concepts for diverse audiences.
- Pitched **MONU (Modular Omni Cooking Equipment)** before an international evaluation panel under **Talent for Japan**.
- Presented **MOTIX** at state-level innovation and startup evaluation events.
- Participated in product design, innovation strategy, entrepreneurship programs, and technical pitching competitions.