

VEDANG AVAGHADE

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EDUCATION

Arizona State University | Tempe, AZ

Aug 2025 – Present

Master of Science in Computer Science

- **Relevant Coursework:** Natural Language Processing, Agentic AI, Foundations of Algorithms, Mobile Computing, Statistical Machine Learning, Data Processing at Scale, Information Assurance

MIT World Peace University | Pune, India

Jul 2019 – Jun 2023

Bachelor of Technology in Computer Science

- **Relevant Coursework:** Object Oriented Programming, Data Structures, Operating Systems, Database Management Systems, Artificial Intelligence, Machine Learning, Deep Learning, IoT

WORK EXPERIENCE

Project Engineer | C-DAC, Pune, India

Nov 2024 – Jul 2025

- Orchestrated the engineering of cross-platform mobile applications (Flutter, Ionic) with MVC architecture and responsive UI, deployed on Android, iOS, and Web, achieving a user base of over 1.5 lakh users.
- Spearheaded the launch of 'Quality First' (PMGSY) and 'Meri Sadak' portals, integrating GPS, REST APIs, multimedia capture, and dashboards to enable monitoring of 98,500 km of rural roads.
- Streamlined .NET Core APIs and optimized MySQL queries for national-scale road datasets, implementing JWT authentication, offline-first synchronization, and async data pipelines.

Software Engineer | Jombay, Pune, India

Oct 2023 – Apr 2024

- Architected a mass mailing platform (Ruby on Rails, AWS, Docker) that automated 100,000+ messages/month, reducing manual work by 75% while integrating WhatsApp and email APIs.
- Directed the optimization of Flutter/Dart mobile workflows, embedding ffmpeg-based video compression to cut file sizes 50% and increase upload success rates by 40%.

Student Intern | C-DAC, Pune, India

Jun 2022 – Feb 2023

- Led the implementation of a U-Net based road extraction model (TensorFlow) achieving 96% accuracy, reducing manual mapping time by 70% and supporting planning across 50+ districts.
- Accelerated training workflows on HPC GPUs, reducing runtime from 12 to 3 hours, and integrated models into a web platform (Angular, Spring Boot) for real-time traffic analysis.

PROJECTS

DeepDebris 4.0: Autonomous Space Guardian | Python, PyTorch, RL (PPO), RAG | [GitHub](#)

- Engineered a Level-4 autonomous space traffic platform merging SGP4 physics with a Residual Neural Network (PINN) to reduce orbital prediction error by ~40%, utilizing LSTMs to detect non-ballistic maneuvers via zero-trust data validation.
- Implemented a Reinforcement Learning (PPO) agent for fuel-optimal collision avoidance and a RAG-driven LLM ("OrbitGPT") to interpret technical reports, enabling automated multi-agent negotiation for satellite conflict resolution.

Qwen2.5-0.5B Fine-Tuning via RLAIF | Python, PPO, LoRA | [GitHub](#)

- Pioneered a "Nano-scale" alignment pipeline for Qwen2.5-0.5B using Heuristic RLAIF (Reinforcement Learning using AI Feedback) and RLVR (Reinforcement Learning using Verifiable Rewards), replacing massive 70B+ judge models with a custom programmatic reward function.
- Achieved 43.75% accuracy on GSM8K with 98% strict format adherence by implementing a hybrid reward system and optimizing training on an offline cluster using LoRA.

Connector-Aware LLM Pretraining | Python, PyTorch, Llama 3.2 | [GitHub](#)

- Devised a "Connector Embedding Amplification" mechanism for Llama 3.2 3B to address gradient starvation, identifying 150+ discourse markers and applying a 1.1x scalar boost to prioritize logical structure learning.
- Validated architecture on 64K documents, confirming stable signal propagation and achieving a theoretical 10% acceleration in gradient updates for reasoning tokens.

TECHNICAL SKILLS

Languages & Databases: Python, JavaScript, C, C++, Ruby, Dart, SQL (MySQL, PostgreSQL), MongoDB, HTML, CSS

Core Concepts: Data Structures, Algorithms, Operating Systems, REST APIs, Microservices, Agile Development

AI/ML Tools: LLMs, Transformers, Hugging Face, NLP, PyTorch, TensorFlow, Keras, Scikit-learn, CNN, ResNet, U-Net

Web, Mobile & Cloud: Flask, Node.js, React.js, Angular, Ruby on Rails, Flutter, Ionic, AWS (EC2, S3), Docker, Git, CI/CD

Certifications: Operating Systems, Python, Ruby on Rails, C++, C