VEDANT JAYANT PADOLE

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SUMMARY

Innovative Data Science and Machine Learning Graduate Student with a 4.0 GPA at Arizona State University, specializing in scalable AI systems, data analytics, and applied machine learning. Proven success building real-time detection systems, analyzing large datasets, and deploying models in cloud environments. Skilled in Python, SQL, PyTorch, and statistical modeling.

KEY ACHIEVEMENTS

- **Scalable Traffic Management System:** Engineered a distributed number plate recognition system using **YOLOv8, AWS, and NVIDIA Jetson Xavier**, increasing toll revenue by **40%** and decreasing congestion by **32%**.
- **Uric Acid Detection App:** Developed a **real-time driver monitoring system** using **YOLOv5 optimized with TensorRT on Jetson Orin**, reducing latency by **15%** and improving inference speed.
- **Drowsiness Detection:** Developed a real-time YOLOv5-based model with 15% decreased latency, enhancing road safety in driver monitoring systems.
- **Academic Research:** Published in **IEEE** and **TIJER** journals, contributing to **sentiment analysis** and **driver monitoring systems**, demonstrating skills in **data structures**, **algorithms**, and **complexity analysis**

EDUCATION

Masters of Science, Computer Science Graduating May 2026
Arizona State University, Tempe, AZ 3.89 GPA
Ira A. Fulton Schools of Engineering
Relevant coursework: Statistical Machine Learning, Data Mining, Generative AI, NLP

TECHNICAL SKILLS

Programming Languages: Python, C, C++, Java, JavaScript, C, R
Databases: MySQL, NoSQL, PostgreSQL, Redis, Firebase, MongoDB, Vector DBs (Pinecone, FAISS)
ML Frameworks : PyTorch, TensorFlow, OpenCV, HuggingFace, CUDA, Taming Transformers,SentencePiece
Architectures and Models: VQGAN, DCGAN, Diffusion Models, CLIP, Transformer-based models
Web Development: Node.js, React, Angular, Express, Tailwind, RESTful Services, SOAP Services

PROFESSIONAL EXPERIENCE

Persistent Systems Pvt Ltd., Pune, India: Software Engineer Jan 2024 – Aug 2024

- Designed a scalable traffic management system with distributed number plate recognition in a team of 5 testing model on **50,000** vehicles and leveraging **YOLOv8**, **Jetson Xavier**.
- Achieved **32%** congestion reduction through multi-threaded algorithms and AWS-based architecture compared to previous architectures.
- Optimized inference speed by **deploying models with TensorRT** on embedded hardware, reducing processing time by **30%**.

Tools Web, Nagpur, India: Full Stack Development Intern May 2023 – Sep 2023

- Developed a dynamic web application using **React** and **Node.js**, with **MongoDB** for backend storage, revamping user query processing speed by 8%.
- Optimized CI/CD pipelines on AWS, reducing deployment time by 25% and increased overall development by 20%
- Enhanced system performance through **RESTful API** integration and streamlined CRUD operations, achieving a 30% reduction in latency

Bio Spectronics, Nagpur, India: Machine Learning Intern Oct 2023 – Jan 2023

- Built an AI-driven smartphone app for uric acid detection, reducing diagnostic errors from **11% to 2%**, improving data reliability by **35%**.
- Implemented data cleaning pipelines and anomaly detection models to revamp reliability, resulting **10%** higher accuracy in diagnostic results

- Deployed application using Kubernetes, enabling containerized microservices and overhauling system scalability and fault tolerance by **20%** .

ACADEMIC PROJECTS

Conversational AI Assistant | React, Node.js, FastAPI, GPT-4, PostgreSQL Fall 2024 – Spring 2025

Collaborated in a team of four to design model for Real-Time Sentiment Classification.

- **Built an AI-driven customer support assistant** using **GPT-4 & Vector Databases (Pinecone, FAISS)** to deliver **real-time, personalized query resolution**, reducing customer escalation rates by **70%**
- **Implemented real-time sentiment analysis pipelines** using **transformers & WebSockets**, dynamically adapting chatbot responses based on user emotions.
- Increased product recommendation accuracy by **15%** by integrating real-time customer sentiment analysis, aligning with **customer obsession** and driving personalized insights.

Semantic Table Join Discovery with LLMs |Gemini, CTAB-GAN+, Spider, LakeBench Spring 2025

Led research on join prediction using Gemini-2.0 across real/synthetic SQL datasets.

- Analyzed **187 join prediction failures** using Gemini-2.0; identified **72% false positives** and **28% false negatives** on the Spider dataset.
- Generated **500+ synthetic table pairs** using CTAB-GAN+ to benchmark semantic join accuracy under schema drift and column mismatch.
- Achieved a **23% improvement in F1-score** on semantic joins over baseline methods using WarpGate.

Text-to-Image Generation with CLIP | PyTorch, VQGAN, DCGAN, CLIP, ImageNet Spring 2025

Implemented VQGAN+CLIP with pooling and DiffusionCLIP using pretrained models

- Trained and evaluated VQGAN+CLIP and DCGAN+CLIP on ImageNet; achieved **26% lower FID score** (127 vs 173) vs cDCGAN.
- Improved CLIP cosine similarity from **0.43 to 0.56** across 200 iterations, indicating **30% gain** in text-image semantic alignment.
- Reduced training instability by **18%** using pooling in VQGAN, enhancing global feature retention and convergence rate.

PUBLICATIONS AND PATENT

- S. S. Aote, K. Tank, A. Khanna, V. Padole and A. Rewatkar, "Driver Monitoring based on Drowsiness and Yawning using YOLOv8," *2024 International Conference on Current Trends in Advanced Computing (ICCTAC)*, Bengaluru, India, 2024, pp. 1-6, doi: 10.1109/ICCTAC61556.2024.10581349.
- V. Shukla, V. Padole, and Student, “Sentiments and Time Series Patterns for Improved Stock Market Predictions: A Comprehensive Study,” 2024. Accessed: Feb. 01, 2025. [Online]. Available: https://tijer.org/tijer/papers/TIJER2401033.pdf
- V. Padole, “Machine Learning Model for Risk of Breast Cancer Relapse,” 2024. Accessed: Feb. 01, 2025. [Online]. Available: https://tijer.org/tijer/papers/TIJER2401102.pdf
- Electronic Component Cutter, Modern Water Bottle