Harshal Dafade

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Education

University of Massachusetts **Sep 2023 - May 2025**

MS Computer Science | GPA: 3.7

- **Coursework:** Algorithms, Operating Systems, Internet of Things, Human Robot Interaction, Human Computer Interaction, ML/DL security and privacy, Natural Language Processing, Internet & Web Systems, Reinforcement Learning, Data Science

Pune University **Sep 2019 - May 2023**

B.E. Computer Engineering | Distinction with Honors in AI/ML | GPA: 3.6

- **Coursework:** Data Structures and Algorithms, Machine Learning, Deep Learning, Artificial Intelligence, Computer Vision, Cloud computing, Blockchain, Data Science and Big Data Analytics, Business Intelligence

Experience

UMass Lowell (Office of Graduate and Professional Studies) **Jan 2024 - May 2025**

Data Analyst/Engineer *Lowell, MA*

- Built and scaled production-grade ETL pipelines in Python and SQL to clean, merge, and transform high-volume admissions data from Salesforce, CSV, and API sources, improving pipeline throughput by 1.3x while maintaining data integrity across 25k+ records/month. Enhanced downstream workflow stability by 30% by resolving data anomalies.
- Developed, evaluated, and deployed machine learning models (logistic regression, decision trees, random forest classifiers) to predict applicant conversion and enrollment, increasing campaign precision by 25%.
- Automated model selection and tuning workflows using GridSearchCV and cross-validation, and delivered Power BI dashboards for real-time insights into admissions trends, pipeline conversion, and model KPIs; reduced manual reporting time by 60%.

UMass Lowell (Lowell Center for Space Science and Technology) **Dec 2023 - May 2025**

Web Maintenance Specialist *Lowell, MA*

- Rebuilt institutional websites using Tridion CMS with responsive design patterns and modular components, improving page load speed by 20%. Enhancing scalability and cross-device compatibility, while boosting website traffic by over 42%.
- Automated site content deployment workflows using Python and Bash scripts, reducing release time by 35% and eliminating reliance on manual FTP transfers through streamlined CI processes.
- Implemented structured metadata, schema.org tags, and WCAG 2.1 compliance, improving SEO performance and accessibility.

All India Council for Technical Education **Mar 2022 - May 2022**

Robotic Process Automation Intern *Pune, Maharashtra*

- Built scalable Blue Prism bots automating approval workflows, reducing operational delay by 45% across document lifecycles.
- Refactored legacy automation scripts into reusable logic blocks and object layers, shortening development cycles by 30%.
- Performed exception handling, logging, and audit trail generation to ensure fault-tolerant automation and compliance.

Projects

Trump Of The Day

Open Source Project Owner (https://github.com/harshaldafade/trump-of-the-day-server)(trumpoftheday.com)

- Built and deployed a full-stack news aggregation platform using React and Node.js, automating web scraping from 20+ verified media sources with real-time ingestion, storing over 7,000 articles in Supabase (PostgreSQL).
- Engineered scalable RESTful APIs and backend architecture supporting deduplication, timestamped indexing, ranking, and metadata-driven querying; structured for modularity and future extensibility.
- Architected data pipelines for long-term content archival and semantic analysis; leading integration of OAuth 2.0, LLM-based summarization, and migration from Netlify to AWS (EC2, S3) for enhanced scalability and server control.
- Directed GitHub-based collaboration with CI/CD workflows, issue tracking, pull request management, and contributor onboarding to drive open-source growth.

ML Based Pothole Detection and Mapping System

Research Collaboration with UMass Lowell (https://github.com/harshaldafade/real-time-pothole-detector)

- Developed a real-time Android application utilizing multi-sensor fusion (accelerometer, gyroscope, magnetometer) and an on device LSTM model for anomaly detection with sub-200ms inference latency.
- Collected and labeled 10,000+ mobile sensor readings across varied road surfaces; trained LSTM and classical models (Random Forest, SVM) achieving 92%+ classification accuracy.
- Engineered a signal processing pipeline extracting frequency (FFT) and statistical (RMS, zero-crossing rate) features for robust time-series analysis and edge inference.
- Integrated Google Maps API for GPS-based pothole geotagging and deployed a feedback loop for user validation and adaptive model retraining, reducing false positives by 30%.

Technical Skills

- **Programming Languages**: Python, C++, Java, JavaScript, TypeScript, Solidity, SQL, Bash, C#, Ruby, PHP
- **Machine Learning & AI**: TensorFlow, PyTorch, Scikit-learn, NumPy, Keras, Hugging Face Transformers, Retrieval-Augmented Generation (RAG), Generative AI, LangChain, Pydantic, Reinforcement Learning (SARSA, Q-learning, n-step TD), Function Approximation, OpenAI Gym, Sentence-Transformers, OpenCV, CNNs, Vision Transformers (ViT)
- **Development & DevOps Tools**: Git, Docker, Kubernetes, Jenkins, VS Code, Postman, SaaS Tools, Jupyter Notebook
- **Cloud & Databases**: AWS (EC2, S3, Lambda), Microsoft Azure, Google Cloud Platform (GCP), Salesforce, PostgreSQL, MySQL, MongoDB, SQLite, AstraDB (Cassandra)