ALI MASHHADI

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SUMMARY

- Senior AI/ML Engineer with 2+ years of industry and 5+ years of research experience in Agentic AI, Generative AI, LLMs, Computer Vision, and Machine Learning.
- Proven expertise in building and deploying end-to-end AI pipelines, including reinforcement learning, GANs, VAEs, diffusion models, multi-modal architectures, and transformer-based LLMs (e.g., GPT, BERT, RAG).
- Skilled in model development, hyperparameter tuning, large-scale training, optimization for inference, and real-time AI/ML applications.

EDUCATION

University of Utah, Ph.D. in Engineering, GPA: 3.96 — Mar 2025
Focused on Machine Learning, Data Science, GenAI, and Computer Vision Models

University of Tehran, M.S. in Engineering and Management, GPA: 4.0 — Sep 2019

University of Tehran, B.S. in Engineering, GPA: 3.70 — Aug 2017

PROFESSIONAL EXPERIENCE

Software Developer — Jun 2025 - present
Workflow Manager (WFM) — *Salt Lake City, UT*

- Design and implement new features across the platform, ensuring scalability, reliability, and seamless integration between components.
- Implement best practices for version control (Git/GitLab), code reviews, and CI/CD pipelines to support efficient development and deployment.

AI/ML Engineer — Jun 2023 - Oct 2025
Wall Consultant Group (WCG) — *Salt Lake City, UT*

- Developed and implemented machine learning and computer vision models for various business and engineering problems.
- Developed strong expertise in Google Looker Studio and Power BI, demonstrating critical thinking to standardize visualizations for key metrics.

Graduate Research Assistant (Data Science Researcher) — Jan 2020 - Dec 2023
University of Utah — *Salt Lake City, UT*

- Led multiple data science projects applying statistical, machine/deep learning, and computer vision techniques to engineering fields, showcasing expertise in diverse data science domains.
- Demonstrated exceptional time management and communication skills, ensuring effective collaboration with a diverse, interdisciplinary team of researchers.

Data Science Intern — May 2022 - Aug 2022
Iteris Inc. — *Santa Ana, CA*

- Analyzed extensive datasets with more than 10 million records, focusing on trajectory, event, and probe data to extract traffic crash patterns, showcasing proficiency in handling large datasets and uncovering valuable insights.
- Demonstrated strong cross-functional collaboration by working closely with database engineers, data scientists, analytics managers, and product management teams.

SKILLS

- **Programming Languages:** Python (advanced), MATLAB, VBA, SQL
- **ML/DL Frameworks:** PyTorch, TensorFlow, Scikit-learn, NumPy, Pandas, SciPy, LightGBM, XGBoost

- **Machine Learning:** Extensive experience in supervised and unsupervised learning, model tuning, cross-validation, and deployment. Proficient in Gradient Boosting, Random Forest, SVM, k-NN, Decision Trees, DNNs (FC-NN, CNN, RNN, LSTM), Clustering, Dimensionality Reduction, and advanced regression methods.
- **Computer Vision:** Developed and deployed models for object detection, segmentation, and image classification using YOLOv10, ResNet, Mask R-CNN, and custom CNNs.
- **Generative AI:** Designed and trained generative models including GANs, CTGANs, VAEs, and diffusion models for tabular and visual data synthesis and augmentation.
- **LLMs & Multimodal AI:** Fine-tuned and deployed LLMs (GPT, BERT, RAG) and multimodal models (LLaVA, LLaMA, Gemma) for NLP, text-image alignment, sentiment analysis, and multimodal classification.
- **Data Visualization & Analytics:** Built interactive dashboards and reports using Looker Studio, Power BI, Tableau; skilled in SQL for backend data integration and querying.
- **DevOps & Deployment Tools:** Proficient in using Docker for containerizing ML pipelines, web apps, and deploying scalable solutions across environments.

SELECTED PROJECTS

1. **Automated Speed Limit Assignment in Variable Speed Limits (VSLs) using Reinforcement Learning** Designed and deployed a Deep Q-Network (DQN)-based reinforcement learning model to dynamically assign speed limits in response to real-time traffic conditions. Improved traffic flow efficiency and safety across two major corridors in Utah.
2. **Automated Asset Condition Assessment using Multimodal Large Language and Vision Models** Built a multimodal AI pipeline using LLaMA, LLaVA, and Gemma to evaluate the condition of roadside safety barriers. Integrated visual and textual inputs for damage type classification and condition scoring, automating inspection across statewide assets.
3. **SBIR Phase I: Artificial Intelligence for Transportation Planning and Design (AI-TPD)** Served as Technical Lead on this federally funded initiative. Developed and evaluated object detection (YOLOv10), segmentation (Mask R-CNN), and classification models to assess roadway images. Led the design of a geospatial web application that visualizes safety ratings and suggests optimal routes based on AI assessments.
4. **Predicting Crash Severity and Frequency using ML and CTGAN-based Data Augmentation** Engineered an ML framework using XGBoost and LGBM, combined with Conditional Tabular GAN (CTGAN) for synthetic data generation. Achieved 93% prediction accuracy for crash severity and frequency, outperforming traditional statistical models.
5. **Hourly Traffic Volume Estimation using Deep Learning and Variational Autoencoders (VAE)** Built and trained a hybrid model combining VAE for feature extraction and LightGBM for prediction, enhancing hourly traffic volume estimates by 8% over prior state-of-the-art methods. Used extensive sensor data and temporal encoding techniques.