Ahmad Amirivojdan

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Summary

Applied Machine Learning Scientist with 5+ years of experience designing, training, and evaluating deep learning models for computer vision, audio, and NLP applications. Proven expertise in experimental design, feature engineering, representation learning, and statistical validation of models deployed in real-world systems. Published researcher with strong production ML and open-source contributions.

Skills

Applied ML: Supervised, self-supervised, feature engineering, representation learning, evaluation, error analysis, hyperparameter optimization, statistical modeling, hypothesis testing
Vision: Object detection, segmentation, action recognition, CNNs, Vision Transformers (ViT), Masked Autoencoder (MAE), YOLO, RT-DETR
NLP: Text normalization, tokenization, embeddings, low-resource NLP, HuggingFace Transformers, LangChain
Engineering: PyTorch, Scikit-Learn, experiment tracking, dataset curation, labeling, deployment pipelines, Docker, AWS, CI/CD
Programming: Python, C++, C#, SQL, Bash

Education

Ph.D. **University of Tennessee Knoxville**, Biosystems Engineering — Feb 2022 to Dec 2026 (Expected)

- **Courseworks:** Deep Learning, Machine Learning, Data Mining and Analytic, Large Language Modeling & GenAI, Bio-Inspired Computation, Natural Language Processing, Embedded Systems, Regression Modeling, Statistics for Research, Electronic Systems, Mathematical Modeling, Advanced Software Engineering, Geographic Information Science (GIS)

M.S. **Qods Azad University**, Artificial Intelligence & Robotics — Sept 2016 to Jan 2020

- **Courseworks:** Mobile Robotics, Image Processing, Pattern Recognition, Fuzzy Logic, Swarm Intelligence, Machine Learning
- **Research:** Development of an in-field vision system to detect saffron flowers using Histogram of Gradients (HOG) features and an SVM classifier Github

B.S. **Parand Azad University**, Computer Hardware Engineering — Sept 2010 to Jan 2016

- **Research:** Development of a fully autonomous humanoid soccer robot consisting locomotion, vision, low-level IO, balancing, and behavior modules to compete in the RoboCup soccer competitions. Github - Video

Selected Works

Shekar: A Python Toolkit for Persian Natural Language Processing Github — Oct 2025
The Journal of Open Source Software – Ahmad Amirivojdan 10.21105/joss.09128
Keywords: applied machine learning, NLP, dataset engineering, model evaluation

ChickenSense: A Low-cost Deep Learning-based Solution for Poultry Feed Consumption Monitoring Using Sound Technology Github — July 2024
Ahmad Amirivojdan, Amin Nasiri, Shengyu Zhou, Yang Zhao, Hao Gan
10.3390/agriengineering6030124

Awards and Honors

1st Place - Robocup Humanoid Soccer Teen-Size Robot League — Aug 2015 - China
3rd Place - Robocup Humanoid Soccer Teen-Size Robot League — Aug 2014 - Brazil

Experience

UT Smart Agriculture Lab, Graduate Research Assistant — TN, USA Feb 2022 - Dec 2026 (Expected)

- Designed and deployed a large-scale data acquisition and labeling pipeline for multi-modal poultry research, collecting over 1 TB of video data and curating 5,000+ pixel-level annotations for instance segmentation tasks.
- Developed, trained, and benchmarked deep learning models for computer vision tasks, including YOLO and RT-DETR for object detection and Masked Autoencoders (MAE) for self-supervised representation learning on high-resolution agricultural imagery.
- Performed systematic model evaluation and baseline comparisons across architectures, optimizing hyperparameters and analyzing failure cases to improve generalization under varying lighting, density, and environmental conditions.
- Designed and trained an audio-based deep learning system for behavioral inference, achieving 92% accuracy in estimating poultry feed intake from piezoelectric sensor signals through feature extraction, temporal modeling, and error analysis.
- Conducted statistical validation of model predictions using hypothesis testing, confidence intervals, and task-specific performance metrics to ensure robustness and reliability for real-world deployment.
- Collaborated with interdisciplinary researchers to translate domain requirements into machine learning objectives, defining evaluation metrics aligned with real-world behavioral and biological constraints.

Kimia Motor, Research and Development Engineer — Aug 2021 - Feb 2022

- Analyzed production workflows and identified bottlenecks, proposing efficiency improvements across manufacturing lines.
- Designed and deployed automated wire feeder for brake production line, improving precision and reducing defect rates. Grabcad
- Developed two-axis linear motion system for gear shifting test bed and Python-based joystick controller interfacing with Delta DVP-SA2 PLC via Modbus protocol. Grabcad

Pars Ertebat, Fullstack Software Engineer — May 2016 - Aug 2021

- Contributed to the development of a horse racing betting solution, achieving an annual revenue of $32 million for the Equestrian Federation of Iran, with over users.
- Developed the back-end of a social media app containig authentication, user management, report generation, etc.

Parand Robotics Research Center, Undergraduate Research Assistant — Jan 2012 - Apr 2016

- Led software development for an autonomous humanoid soccer robot, implementing omni-directional bipedal locomotion with IMU-based PID stabilization and real-time ball tracking using computer vision and contour segmentation.
- Architected multi-threaded modular software system following SOLID and OOP principles, integrating FSM-based behavior control with low-level servo actuator and sensor interfaces.
- Developed open-source IMU platform with Atmega32 firmware, C# libraries, configuration tools, and 3D simulator compatible with Dynamixel protocol. Github

Certifications

Generative Adversarial Networks (GANs) Specialization - Coursera — Jan 2026
Natural Language Processing Specialization - Coursera — Apr 2025
Developing LLM Applications with LangChain - DataCamp — Nov 2024
Big Data Fundamentals with PySpark - DataCamp — Nov 2024
AWS Cloud Practitioner Essentials - Amazon Web Services — Oct 2024
Machine Learning - Coursera — Nov 2020