

Ahmad Amirivojdan

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Summary

Applied ML scientist and Ph.D. candidate with 5+ years of experience developing large-scale datasets, benchmarks, and end-to-end ML systems across computer vision, audio, and NLP. Created ChickenVerse, a multi-task poultry vision benchmark, and Shekar, a Persian NLP toolkit with 35K+ downloads. Experienced in representation learning, model evaluation, data engineering, and deployment of reproducible open-source ML systems.

Technical Skills

Programming: Python, C++, C#, SQL, Bash, Linux

Machine Learning: Deep learning, self-supervised learning, transfer learning, model fine-tuning, hyperparameter optimization, benchmarking, error analysis

Computer Vision: Object detection, instance segmentation, video action recognition, multi-object tracking, CNNs, Vision Transformers, OpenCV

NLP and Speech: Text preprocessing and augmentation, tokenization, text embeddings, POS tagging, named entity recognition, dependency parsing, text classification, transliteration, ASR, model fine-tuning

ML Frameworks and Data: PyTorch, Hugging Face, scikit-learn, NumPy, Pandas, PySpark, MLflow, FiftyOne

Deployment and MLOps: model export and quantization, Docker, FastAPI, Git, GitHub Actions, CI/CD, AWS S3

Data Engineering: Dataset curation and versioning, annotation pipelines, data validation, quality auditing, and large-scale preprocessing

Experience

University of Tennessee, Knoxville — Graduate Research Assistant, Smart Agriculture Lab (Feb 2022 – Present)

- Designed and operated end-to-end data acquisition, curation, and annotation pipelines across five poultry facilities, managing 1+ TB of multimodal data (video, audio, sensor signals) with versioned releases and quality-control audits.
- Built automated annotation workflows combining detection, multi-object tracking, and human-in-the-loop review, cutting manual labeling effort by an order of magnitude.
- Trained and benchmarked 15+ architectures spanning object detection (YOLO, RT-DETR), video action recognition (VideoMAE, TimeSformer, ViViT, V-JEPA 2), and audio classification, with reproducible experiment tracking and standardized evaluation protocols.
- Developing self-supervised representation learning at scale, pretraining Masked Autoencoders on unlabeled farm video to improve downstream behavior recognition under limited labels.
- Designed cross-farm evaluation with held-out-facility splits and leave-one-farm-out cross-validation to quantify generalization under distribution shift in lighting, camera, and housing conditions.
- Optimized models for edge deployment via ONNX export with FP32/INT8 quantization, profiling accuracy, latency, and model-size trade-offs.
- Published first-author research on multimodal sensing systems and translated domain requirements from animal scientists into ML objectives, metrics, and validation criteria.

Kimia Motor — Research and Development Engineer (Aug 2021 – Feb 2022)

- Designed an automated wire feeder for a brake production line, reducing defect rates by 20%. [Grabcad](#)
- Built a two-axis linear motion system for a gear-shifting test bed with a Python joystick controller interfacing a Delta DVP-SA2 PLC over Modbus. [Grabcad](#)

Pars Ertebat — Full-Stack Software Engineer (May 2016 – Aug 2021)

- Contributed to a nationwide horse-racing wagering platform for the Equestrian Federation of Iran, processing \$32 million in annual transactions.
- Developed a social media back end with authentication, user management, and reporting.

Experience

Parand Robotics Research Center — Undergraduate Research Assistant (Jan 2012 – Apr 2016)

- Led the humanoid robotics software team using Agile development practices, coordinating feature planning, implementation, testing, and system integration for international RoboCup competitions.
- Increased the robot's walking speed by approximately 30% by designing and implementing a trajectory-based gait-generation engine for omnidirectional bipedal locomotion.
- Improved locomotion stability by integrating IMU-based feedback with PID control to stabilize the robot's center of mass, reducing falls by approximately 50% during walking and dynamic maneuvers.
- Designed and implemented a modular software architecture using object-oriented principles, including a low-level communication layer for reliable real-time interaction among sensors, actuators, and control modules.

Selected Projects

ChickenVerse: Open Multi-Task Poultry Vision Dataset (Jun 2026) [GitHub](#)

Built a large-scale dataset for chicken detection, instance segmentation, and behavior recognition, with 153,764 instance-level boxes and masks across 6,539 images and 15,250 single-bird video clips spanning 15 behavior classes.

Neyshekar: Large-Scale Open Persian Speech Dataset (May 2026) [GitHub](#)

Curated 40,000+ recordings spanning 63+ hours and 456K tokens for Persian ASR and TTS research; released under CC0 with versioned data.

Shekar: Python Toolkit for Persian Natural Language Processing (Oct 2025) [GitHub](#)

Developed an open-source Persian NLP toolkit with normalization, tokenization, embeddings, NER, and POS tagging; achieved 35K+ PyPI downloads and 95%+ test coverage.

ChickenSense: Poultry Feed-Intake Monitoring System (Jul 2024) [GitHub](#)

Built a dual-branch CNN that classified feed-pecking events from low-cost piezoelectric sensor signals with 92% accuracy and 91% F1.

Humanoid Soccer Robot: Autonomous Robotics Software Framework (2012 – 2016) [GitHub](#)

Developed a modular framework for an autonomous humanoid soccer robot, integrating real-time vision-based ball tracking, omnidirectional locomotion, IMU-based stabilization, and finite-state behavior control.

PRO-IMU: Open-Source Inertial Measurement Unit (2012 – 2016) [GitHub](#)

Built an open-source IMU platform with ATmega32 firmware compatible with the Dynamixel communication protocol, client libraries and a 3D simulator.

Education

Ph.D. in Biosystems Engineering — University of Tennessee, Knoxville (Feb 2022 – Dec 2027, Expected)

- **GPA:** 3.93
- **Courseworks:** Deep Learning, Machine Learning, Data Mining and Analytics, 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. in Artificial Intelligence & Robotics — Islamic Azad University, Qods Branch (Sep 2016 – Jan 2020)

- **Thesis:** Vision system to detect saffron flowers using HOG features and an SVM classifier. [Github](#)

B.S. in Computer Hardware Engineering — Islamic Azad University, Parand Branch (Sep 2010 – Jan 2016)

Awards and Honors

1st Place, RoboCup Humanoid Soccer Teen-Size League (China, 2015)

3rd Place, RoboCup Humanoid Soccer Teen-Size League (Brazil, 2014)

Certifications

Generative Adversarial Networks (GANs) Specialization (Coursera, Jan 2025)

Natural Language Processing Specialization (Coursera, Apr 2025)

AWS Cloud Practitioner Essentials (Amazon Web Services, Oct 2024)

Big Data Fundamentals with PySpark (DataCamp, Nov 2024)