Bardia Azami

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RESEARCH INTERESTS

My research interests lie in representation learning and the development of AI systems that can build structured representations of the world. With a background in computer vision, I am particularly interested in world models, multimodal learning, and self-supervised approaches to learning from visual and other sensory data. I am interested in understanding how models develop meaningful representations beyond surface-level patterns, and how these representations can support more efficient learning, reasoning, and generalization.

EDUCATION

Graduate Certificate in Artificial Intelligence & Software Development May 2025
Algonquin College (CGPA: 3.82/4.00) *Ottawa, Canada*

B.Sc. in Electrical Engineering Jul 2022
University of Isfahan (CGPA: 16.44/20 | Last 60 Credits GPA: 17.84/20) *Isfahan, Iran*
Thesis: Low-Dose CT-Scan Denoising Using a Deep Convolutional Network (19.5/20)

RESEARCH EXPERIENCE

Computer Vision Researcher: *University of Isfahan* Sep 2022 – Jul 2023
Vision Transformers vs. CNNs for early outdoor fire and smoke detection *Isfahan, IR*

- Designed a comparative benchmark of five CNN and Vision Transformer architectures (ResNet50/101, RegNetX/Y, DeiT) behind an identical classifier head to investigate their effectiveness at detecting fire and smoke in unstructured outdoor environments.
- Curated a 10,656-image dataset from web sources and video frames, addressing the limited diversity of existing fire and smoke datasets.
- Evaluated accuracy, precision, recall, F1-score, and computational complexity (FLOPs); the Vision Transformer reached 95.7% fire and 94.8% smoke accuracy, about 2.7 percentage points above the CNN baselines, with 13 false positives against 30–46.
- Conducted false-positive analysis, tracing 35% of errors to firefighter and red-vehicle appearances.

SELECTED PROJECTS

DataMind: *FastAPI, React/TypeScript, SQL, LLMs* 2026

- Built a conversational BI platform with a ten-node text-to-SQL pipeline and bounded repair loop, treating model-generated SQL as untrusted via a fail-closed AST guard tested against a hostile-input corpus in CI.

CareerFlow AI: *Python, Pydantic, FastAPI, LLM APIs* 2025

- Built an LLM pipeline that tailors a LaTeX resume to a job posting, with a constraint engine that guarantees a page budget and structured output validated against known keys so a hallucinated ranking cannot delete real content.

Gesture-Based Multimodal Robotic Control: *ROS 2, Python, OpenCV* 2024

- Built a ROS 2 stack with a robotics team that combines webcam vision, gesture-derived motion, and spoken feedback so a mobile robot can be teleoperated by hand gestures.
- Integrated the three modalities for real-time use: mapped fingertip tracking to bounded velocity commands and kept blocking audio off the callback path so vision, motion, and speech run together.

Pistachio Dataset Analysis and Modeling: *scikit-learn, TensorFlow/Keras* 2024

- Compared handcrafted shape and colour features with pretrained and custom CNN embeddings, applying feature selection and dimensionality reduction (RFE, PCA/LDA).
- Handled class imbalance with leakage-free SMOTE, and used outlier detection and clustering to surface mislabelled and anomalous samples.

PROFESSIONAL EXPERIENCE

AI Engineer Internship: *Behyar Sanaat Sepahan* Jun 2021 – Jun 2022
Low-Dose CT Image Denoising and Reconstruction *Iran*

- Developed a dilated residual network for low-dose CT image denoising, expanding the receptive field without pooling or additional parameters.
- Implemented a differentiable Sobel edge-detection layer and a hybrid perceptual-pixel loss to preserve anatomical structures during reconstruction.

- Generated over 10,000 paired training images through synthetic Poisson noise injection, addressing the lack of paired clinical low-dose/full-dose data.
- Continued this work as my undergraduate thesis, evaluated with a score of 19.5/20.

Electronic Engineer: *Noavarihaye Tak* Dec 2020 – May 2021

Embedded vision hardware for smart surveillance

- Took embedded vision hardware from schematic to a field-validated prototype, owning mixed-signal PCB design (Altium) and bare-metal C firmware over UART/SPI/I2C.
- Built a per-subsystem test protocol that cut hardware debug time by an estimated 25–30%, and revised the schematic after field trials exposed interference that bench tests missed.

TEACHING & MENTORSHIP

Teaching Assistant: Design and Hardware Description of Computers Fall 2021

University of Isfahan *Isfahan, Iran*

- Assisted undergraduate students with computer architecture concepts, assignments, and laboratory exercises.
- Supported course instruction and student problem-solving in processor architecture, memory systems, and instruction execution.

Mentor: *University of Isfahan* Fall 2021

Image processing workshop *Isfahan, IR*

- Delivered an in-person, hands-on image processing workshop to more than 50 students, introducing fundamental concepts and practical techniques.

AWARDS & DISTINCTIONS

First Place — Sharif DataDays 2022 Aug 2023

- Ranked 1st among 2,000+ participants in a two-stage competition involving time-series anomaly detection and DDoS attack detection.

Third Place — Torob Data Challenge 2023 May 2023

- Placed 3rd in a large-scale product search optimization challenge using Learning to Rank, evaluated in both offline and live production settings.

TECHNICAL SKILLS

Programming: Python, C++, MATLAB, SQL, Bash, Embedded C
Machine Learning & Computer Vision: PyTorch, TensorFlow/Keras, scikit-learn, OpenCV, CNNs, Vision Transformers, XGBoost
LLMs & Retrieval: Hugging Face Transformers, LangChain, LlamaIndex, FAISS, ChromaDB, OpenAI/Anthropic APIs
Data & Infrastructure: PostgreSQL, pandas, NumPy, SciPy, Docker, Git, Linux, AWS, MLflow, Weights & Biases
Hardware & Robotics: ROS 2, Altium Designer, Proteus, AVR, UART, SPI, I2C

CERTIFICATIONS & VOLUNTEERING

Ultimate AWS Certified Solutions Architect Associate Aug 2026
Agentic AI (link) Mar 2026
Supervised Machine Learning: Regression and Classification (link) Dec 2022

Volunteer: *KASA* Jul 2020 – Sep 2022

NGO supporting children with cancer *Isfahan, IR*

- Supported activities organized by an NGO providing assistance and recreational programs for children with cancer.