Danyal Khorami

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Research interests: Computer vision; temporal perception models; sensor fusion & IoT; XR/motion capture; embodied AI; computational media.

Education

Arizona State University, Tempe, AZ   Expected May 2026
MFA in Interdisciplinary Media Arts
Tehran University of Art, Tehran, Iran   2023
M.A. in Photography (Media & Image Theory), GPA 3.98
University of Applied Science and Technology, Arak, Iran   2020
B.A. in Graphic Design, GPA 3.86

Selected Coursework

Deep Learning Foundations and Applications (EEE 598); Computer Vision and Pattern Recognition (EEE 598); Ray Tracing (EEE 598); Minds and Machines (AME 598); Programming for the Internet of Things (AME 598); Principles of Programming (CSE 110).

Selected Course Projects (Deep Learning & IoT)

EEE 598 (Deep Learning) – Assignments 1–4

- **Assignment 1:** Trained a 3-class image classifier (cat/dog/other) via Teachable Machine with dataset curation, 85/15 split, hyperparameter tuning, and qualitative error analysis; set up SOL (conda + PyTorch GPU), launched interactive A100 sessions, verified GPU allocation (nvidia-smi), and configured Jupyter kernel; completed PyTorch fundamentals (tensors, autograd, parameter counting) on GPU.

- **Assignment 2:** Implemented perceptron (by hand + code) with training visualization (video) and non-separable case behavior; implemented backpropagation for a small ANN from scratch (UDL-aligned derivations); trained **MLP vs. KANs** on house-price data with 70/20/10 splits demonstrating a setting where KAN outperforms; trained **EfficientNetV2-S** on Oxford Flowers-102 with architecture widening under parameter budget, **2-GPU training**, custom augmentation, and Grad-CAM feature visualization.

- **Assignment 3:** Built **perceptual losses** using VGG-16 features and compared to ℓ_1/ℓ_2 under translation/noise; designed turbulence-robust features using simulated turbulence data (DAATSim); trained **ViT-B32** on PV-fault classification (12 classes) with class balancing to 2500/class via down/up-sampling + augmentation and evaluated multiple fine-tuning strategies (head-only vs partial vs full); designed and trained a **custom ResNet-36** from scratch on ImageNet (prototype-to-full), introduced a **custom activation function** (analytic definition + plotted curve), and compared against ReLU and ResNet-34 baselines.

- **Assignment 4:** Built GRU-based **music generation** with controllable sampling parameters; reproduced **SIREN** implicit neural representations on $\geq 1024\times 1024$ images and evaluated a custom positional/activation encoding; implemented **segmentation + Gaussian blur** and **depth-based lens blur** using monocular depth estimation (Hugging Face models); trained **DCGAN, Progressive GAN, and diffusion** models on custom datasets, performed latent interpolation, and documented encoding/denoising trajectories; benchmarked practical training behavior on **NVIDIA A100** vs. **Intel Habana Gaudi** using SOL/HPC workflows.

AME 598 (Programming for the Internet of Things) – IoT Builds

- **Opuntia – Solar-Powered Sensor-Fusion Environmental Station:** Built an off-grid station using an ESP32-C3 with solar + Li-ion power stack and battery management; integrated multi-sensor telemetry (temperature/humidity/pressure/soil/field sensing); implemented website broadcasting with database-backed logging (MongoDB) for daily histories and local microclimate measurement; designed around power budget, duty cycling, timestamp integrity, and outage recovery/backfill.

- **Servo-Based Camera Stabilizer:** Built a compact stabilizer driven by servo motors for stabilized capture in embedded/IoT contexts; prototyped control logic for smooth actuation with emphasis on practical implementation and debugging.

Research Experience & Technical Projects

Mesquite MoCap – Open-Source Wearable 6-DoF Motion Capture System

- Co-developed an open-source, real-time full-body system using 15 wireless ESP32-C3 IMU nodes.

- Built and debugged Arduino/ESP32 firmware with time-synchronized networking, packet handling, and real-time streaming.

- Tuned sensor fusion to ∼32 FPS, <15 ms latency, and ∼99.7% packet delivery; implemented BVH export.

- Benchmarked against OptiTrack with ∼2–5° joint error; accepted to IndiaFOSS 2025; IEEE manuscript under review.

Multi-Phone 3D Capture Rig – Small-Scale Multi-View Motion Capture

- Designing a rig with ≥4 synchronized Android phones (e.g., Samsung S23) for small-scale 3D/multi-view capture.

- Developing multi-view calibration, temporal synchronization, and pipelines for pose estimation and mesh reconstruction.

- Intended as a flexible, low-cost platform for human motion, XR, and human–robot interaction experiments.

Temporal Fusion Transformers for Financial Forecasting (EEE 598 Final Project)

- Co-led S&P 500 return forecasting using Temporal Fusion Transformers (TFT) with LSTM baselines.

- Designed a mixed-frequency data pipeline for macro + equity time series; handled preprocessing and alignment constraints.

- Implemented TFT variants (separate embeddings for endogenous vs. exogenous features); managed ablations under tight deadlines.

Artistic Research & Computational Media Projects

To Wilt – MFA Thesis (Solo Exhibition, 4 Spaces)

- Research-driven installation studying how LLMs express (or simulate) *love* and *emotion* through long-form model-to-model dialogue, followed by qualitative/analytic study and paper writing.

- **Space 1:** An 8-screen video wall showing a 3D Blender rose-growth animation as metaphor; three fine-tuned/prompted LLM "voices" (philosopher/phenomenologist, neuroscientist, lover) interpret emotion, perception, and attachment.

- **Space 2:** Two LLM "lovers" in extended conversation presented on a webpage while two networked dot-matrix printers (via Raspberry Pi) print the dialogue live in real time.

- **Space 3:** Time-lapse morphing of a self-captured decay dataset (∼22k images) paired with the three LLM voices analyzing the "decay of feelings" over time.

- **Space 4:** A large rose tank instrumented with sensor fusion (temperature/pressure/humidity, etc.), logging and printing measurements every 5 minutes; LLM voices reflect on emotional decay under measurable environmental change.

Happenstance – Image-to-Avatar Pipeline for Virtual Worlds (In Progress)

- Began building a pipeline that turns a single human photograph into a rigged 3D character for fast import into virtual environments.

- Used Facebook Research *PiFUHD* (pixel-aligned implicit function) for high-resolution 3D human digitization from images.

- Rigged extracted meshes using Mixamo to add armatures/animation readiness; iterating toward a faster, repeatable end-to-end workflow.

Exhibitions, Talks, & Collections

Artist Talks (ASU Herberger Institute for Design and the Arts)

- Spring 2024 – Artist Talk, ASU Herberger Institute for Design and the Arts.

- Fall 2025 – Artist Talk, ASU Herberger Institute for Design and the Arts.

Selected Group Exhibitions

- 2025 — *Smile You Are on Camera*, Northlight Gallery, Phoenix.

- 2024 — *SPE Northwest Conference: Renewal*, Mt. Hood Community College, Oregon.

- 2024 — *Phoenix Transect*, Northlight Gallery, Phoenix.

- 2024 — *Fieldnotes*, Harry Wood Gallery, Tempe (May 27–Aug. 30, 2024; reception Aug. 27).

- 2024 — *Galbirt Prize Exhibition*, Gallery 100, Phoenix.

- 2023 — Group Exhibition, Harry Wood Gallery, Phoenix.

- 2022 — Group Exhibition, Shames Gallery, Tehran.

- 2022 — Group Exhibition, Tehran University of Art Gallery, Tehran.

Collections

- 2024 — Northlight Gallery, Phoenix.

- 2022 — Tehran University of Art Gallery, Tehran, Iran.

- 2020 — Arak Applied University Art Gallery, Arak, Iran.

Teaching Experience

Instructor of Record, School of Art, Arizona State University

- ART 122 – Introduction to Photography II (Fall 2025; Spring 2026, two sections)

- ART 310 – Landscape Photography (Fall 2025)

- ART 121 – Introduction to Photography I (Spring 2025)

- ART 116 – Intro to Digital Media (Spring 2024; Summer 2025, two sections)

- Responsibilities: course design, lectures/demos, critiques, grading, mentoring.

Graduate Research & Teaching Assistant, Northlight Gallery & School of Art, ASU Aug 2023–Spring 2025

- Northlight Gallery: assisted curation, installation, collection handling, and public programs.

- TA: Intro to Photography I (Fall 2024); Photography (Fall 2023); supported critiques, demos, and feedback.

Technical & Artistic Skills

Programming & Data	Python (NumPy, Pandas, Matplotlib, Jupyter); PyTorch, basic TensorFlow/Keras, scikit-learn; OpenCV, torchvision; temporal models (LSTM, TFT basics); Linux (Ubuntu), SLURM, conda/mamba, HPC workflows.
Embedded & Hardware	ESP32 / ESP32-C3, Arduino ecosystem; environmental sensors; IMU sensors (accelerometer, gyroscope), basic sensor fusion; IoT prototyping; serial/network communication; low-power telemetry concepts.
Imaging, 3D & XR	Blender (including geometry nodes); motion capture workflows (BVH export, rigging pipelines); PiFUHD-based reconstruction; Mixamo rigging pipeline.

Publications & Theses

Vanani, P., Patel, D., **Khorami, D.**, Munaganuru, S., Reddy, P., Reddy, V., Raghunath, B., Kidané, A., & Gowda, T. (under review). *Mesquite MoCap: Democratizing Real-Time Motion Capture with Affordable, Open-Source, Networked IMU Hardware and WebXR.* Manuscript under review (IEEE).

M.A. Thesis (Tehran University of Art, 2023): *A Study and Analysis on the Place of Photography in Eco-Art (Case Study: Edward Burtynsky).*

Fellowships, Awards, and Honors

Arizona State University	2023–2026: Tuition Award, ASU; 2024: Fellowship, Anderson Ranch Arts Center Residency, Colorado, USA.
Tehran University of Art, Tehran, Iran	2020–2023: Tuition Awards, M.A. in Photography; 2019: Ranked 19th among ~54,000 candidates in National M.A. Entrance Exam (Photography); full tuition waiver.