Kianoosh Vadaei

GitHub | LinkedIn | Homepage | Google Scholar | Email

Education

University of Isfahan Sep '21 – Present

B.S. Computer Engineering

- **GPA:** 3.6/4.0
- **GPA (last four semesters):** 3.77/4.0
- **Thesis topic:** A Unified Self-Supervised Learning Framework Across Modalities [Project Website]

Relevant Courses

Fundamentals of Machine Learning (20/20) – **Fundamentals of Data Mining** (20/20) – **Fundamentals of IoT Device Programming** (20/20) – **Applications of AI in Cybersecurity** (20/20) – **Special Topics - Deep Learning** (19.8/20) – **Fundamentals of Computational Intelligence** (19/20)

Research Interests

Adversarial Robustness | Trustworthy AI | Multimodal Representation Learning | Self-Supervised Learning | Explainable and Interpretable Deep Learning | Video Understanding and Reasoning

Selected Publications

When 1+1 ≠ 2: Benchmarking Civil-Time Reasoning in Large Language Models EACL 2027

M. Shirian, **K. Vadaei (Co-First Author)**, A. Hemmat, M. H. Shaker Ardakani, A. Mamanpoosh, M. Moqadas, A. Rismanchian, A. Fatemi

Accepted — Preprint (arXiv:2611.29972). [Link]

From Scenes to Semantics: PersianCLEVR for Bilingual 3D Visual Reasoning NeurIPS WS 2025

K. Vadaei, M. Shirian, A. Hemmat, M. H. Heydari, A. Mamanpoosh, A. Fatemi

Published (Spotlight) — VLM4RWD Workshop. [Link]

Adaptive Chunking for VideoRAG Pipelines with a Newly Gathered Bilingual Educational Dataset CSICC 2025

M. Shirian, A. Hemmat, **K. Vadaei (Co-First Author)**, M. H. Heydari, A. Fatemi

Published (oral). [Link]

How Much Do ℓ_1 Attacks Need Concentrated Perturbations? AAAI WS 2027 (Under Review)

M. Shirian, **K. Vadaei (Co-First Author)**, A. Hemmat

Preprint (arXiv:2610.27773). [Link]

Don't Waste the Noise: Importance-Guided Perturbation Allocation under Joint Global and Local Constraints AAAI WS 2027 (Under Review)

M. Shirian, **K. Vadaei (Co-First Author)**

Preprint (arXiv:2610.00861). [Link]

Semantic Apertures: Recognizing Structure Under Competing Visual Content CVPR 2027 (Under Review)

K. Vadaei, M. Shirian, M. Sabokrou

PrismSSL: One Interface, Many Modalities; A Single-Interface Library for Multimodal Self-Supervised Learning Preprint

M. Shirian, **K. Vadaei (Co-First Author)**, K. Majlessi, A. Ebrahimi, A. Hemmat, P. Adibi, H. Karshenas

Preprint (arXiv:2511.17776). [Link]

Research Experience

Adversarial Robustness | *Independent Research, OIST Institute (Japan)* Jan '26 – Present

- I investigated visual concept encoding through shape–texture bias, latent representations, and feature attribution across standard and robust networks.
- I hypothesized excessive ℓ_1 perturbation concentration, co-developing cap-constrained evaluation and importance guided allocation to preserve or improve ASR, yielding two independent-research AAAI SAFE submissions.
- I designed core experiments for a mirror-inspired benchmark probing structure–content conflicts, compositional shifts, and representational failures across white-box/black-box models under OIST supervision.

Benchmarking & Failure Mode of Reasoning in LMs | *Univ. Collab. (Isfahan, Oxford, Tehran)* Nov '25 – Nov '26

- I designed experiments, prompt pipelines, CLEVR data translation, and structured QA generation, benchmarked open-source/proprietary VLMs on 3D spatial reasoning, and presented the work oraly at NeurIPS VLM4RWD.
- I co-developed CivilBench (EACL), benchmarking civil-time reasoning under ISO-8601 constraints across zero-shot, ICL, and fine-tuned LLMs, demonstrating fine-tuning gains in calendrical reasoning.

Computational Neuroscience | *Independent Research* Sep '26 – Present

- Quantifying how noise and blur alter robust CNN–EEG alignment at matched representational drift using time-resolved RSA (bioRxiv).

Self-Supervised Learning: Methods & Architectural Design | *ILS-UI Lab* May '25 – Sep '25

- I co-developed a PyTorch library (PyPI, API/GUI), implementing audio/vision/graph/cross-modal SSL architectures, linear probing, LoRA fine-tuning, CTC phoneme modeling, and zero-shot matching/retrieval.
- I designed a BLIP-2-inspired audio–visual architecture with Q-Former-only training, global contrastive matching, and EMA-guided masked token prediction, targeting local semantic alignment and OOD robustness.

Video Retrieval Pipeline Design & Benchmarking | *University of Isfahan* Sep '24 – Jan '25

- In our CSICC paper, I co-developed adaptive segmentation via CLIP-SSIM semantic and boundary detection.
- I explored entropy-based keyframe selection and multimodal retrieval, co-releasing the pipeline (PyPI).

Work Experience

AI Engineer (Part-time, Remote) | *StudyVisor — United Kingdom* Apr '26 – Present

- I deployed knowledge-graph retrieval and LLM-driven adaptive learning-path orchestration on Django/PostgreSQL.

AI Research Intern (Competitive Selection, 2 Admits) | *Hoopad Vision Co.* Summer '24

- I optimized LLM serving and function calling for smart-home automation, alongside Siamese-network R&D.

Academic Service

Teaching Assistantships

- Served as a TA for **15+** course sections, with responsibilities including project and assignment design.
- Courses assisted: **Fundamentals of CS and Programming** (4 sections), **Advanced Programming** (4 sections), **Algorithms Design**, **Computer Architecture** (3 sections), **Fundamentals of IoT**, **Microprocessors and Assembly Language**, **Applications of AI in Cybersecurity**, **Computer Skills Workshop** (3 sections).

Peer Reviewing

- Reviewed 3 research papers for the NeurIPS 2025 Workshop on Vision-Language Models for VLM4RWD.

Leadership And Awards

Academic & Community Leadership

- **Chairman, University of Isfahan AI Community (UIAIC):** Elected twice to lead the university AI community, overseeing technical events, workshops, and AI-focused competitions.
- **Editor-in-Chief, *Gradient* Magazine:** Led editorial strategy and publication of UIAIC's technical magazine.
- **Organizer, TEDx University of Isfahan:** Core organizer of the 4th TEDx event (100+ attendees) and co-organizer of the 5th edition, coordinating multiple teams and ensuring compliance with TEDx guidelines. [Link]
- **Executive Committee Member, 7th International Conference on Internet of Things and Its Applications:** Contributed to conference coordination, communications, and operational planning.
- **Executive Head, Rasta Association Summer School 2024 (Sharif University of Technology):** Led academic and organizational planning for a national-level summer school program.

Skills

Technical Languages: Python (Advanced), C#, C++, Shell (Linux), LaTeX
Frameworks & Libraries: PyTorch (Advanced), Transformers, Pandas, Scikit-learn, NumPy
Tools: Git, Weights & Biases (W&B)
Languages: IELTS 7.5 (Listening: 8.0, Reading: 7.5, Writing: 7.0, Speaking: 7.0), C1