# Farzad Beizaee

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## *Professional Summary*

Ph.D. in Computer Science with over 5 years research and applied machine learning experience in computer vision, with core expertise in generative models (Diffusion, Normalizing flows, Rectified flows). Strong publication record in top-tier venues like CVPR, NeurIPS, MICCAI, MedIA, etc., and passionate about pushing the boundaries of generative modeling and translating advanced machine learning into real-world solutions in multimedia generation, autonomous systems, and healthcare.

## *Education*

**Ph.D. in Computer Science** — *Sep. 2021 – Sep. 2025*
*École de technologie supérieure (ÉTS), Montreal, Canada* — *GPA: 4.3/4.3*
- *Thesis: Advancing brain MRI assessment using generative models*

**M.Sc. in Artificial Intelligence & Robotics** — *Sep. 2017 – Jan. 2020*
*Sharif University of Technology, Tehran, Iran* — *GPA: 17.58/20*
- *Thesis: Human Action Recognition from RGB-D Videos using deep neural networks*

## *Selected Publications*

Please see the full list at: Google Scholar

- **CVPR 2025**: Correcting Deviations from Normality: A Reformulated Diffusion Model for Multi-Class Unsupervised Anomaly Detection, *F. Beizaee et al.*
- **MICCAI 2025**: REFLECT: Rectified Flows for Efficient Brain Anomaly Correction Transport, *F. Beizaee et al.*
- **Medical Image Analysis**: Harmonizing Flows: Leveraging normalizing flows for unsupervised and source-free MRI harmonization, *F. Beizaee et al.*
- **IPMI 2025**: MAD-AD: Masked Diffusion for Unsupervised Brain Anomaly Detection, *F. Beizaee et al.*
- **ICLR 2025 (Submitted)**: Locality-Attending Vision Transformer, *S. Hajimiri et al.*
- **NeurIPS 2025**: Test-Time Adaptation of Vision-Language Models for Open-Vocabulary Semantic Segmentation, *M. Nouri et al.*
- **ICML 2025**: SMART-PC: Skeletal Model Adaptation for Robust Test-Time Training in Point Clouds, *A. Bahri et al.*
- **CVPR 2025**: Spectral State Space Model for Rotation-Invariant Visual Representation Learning, *S. Dastani et al.*
- **NeurIPS 2024**: WATT: Weight Average Test-Time Adaption of CLIP, *D. Osowiechi et al.*

## *Work/Research Experience*

**Research Assistant** — *Sep. 2021 – Sep. 2025*
*LIVIA @ ÉTS Montreal + CHU Sainte-Justine* — *Montreal, Canada*
- **Unsupervised Anomaly Detection**: Proposed novel generative-model-based frameworks for unsupervised anomaly detection, enabling improved performance on both industrial inspection and medical imaging tasks.
- **Image Translation**: Developed unsupervised methods for cross-site MRI harmonization using generative models, enabling more reliable downstream analysis.
- **Vision Language Models**: Explored gist extraction to improve VLM (e.g., CLIP) zero-shot classification and contributed to research on VLM adaptation for reliable classification and segmentation under domain shifts.
- **Brain MRI analysis**: Proposed learning-based approaches for brain segmentation, neonatal age estimation, and clinical outcome prediction, advancing automated analysis of brain MRIs.
- **Representation Learning**: Contributed to research on modifying vision transformers to enhance local attention for dense prediction tasks and on exploring Mamba state space models for improved representation learning.

**Machine Learning Researcher Intern** *Dec. 2023 – Apr. 2024*
*Zebra Technologies* *Montreal, Canada*

- **Developed Character Detection for OCR**: Developed and optimized a real-time object detection model for industrial OCR and performed comprehensive validation to ensure robustness and reliability.

**Machine Learning Researcher** *Aug. 2020 – Aug. 2021*
*BARAI startup* *Tehran, Iran*

- **Clothes visual search**: Researched and developed high-performing models for clothes detection, segmentation, and image retrieval for a visual search application, while also creating the dataset.
- **Attribute Tagging**: Developed multi-task networks for automated attribute tagging for online marketplace.
- **Document OCR**: Developed Persian document OCR using detection and recognition networks, leveraging a GNN for information parsing.

**Machine Learning Engineer** *July 2020 – Aug. 2020*
*Vida startup* *Tehran, Iran*

- **Full Face Authentication**: Developed face-detection, recognition, liveness, blinking, and spoof detection.

**Part-time Machine Learning Researcher** *Aug. 2019 – Feb. 2021*
*Institute for Research in Fundamental Sciences (IPM)* *Tehran, Iran*

- **Incremental Learning**: Extracted and used *data-impressions* for incremental learning

**Research Assistant** *Sep. 2017 – Jan. 2020*
*IPL @ Sharif University of Technology* *Tehran, Iran*

- **Human Action Recognition**: Designed and implemented multiple deep learning architectures for human action recognition, including *Distilled Auto-Encoder*, *Depth-map 3D Network*, and *3D Capsule Network*.
- **Comprehensive Analysis on human action recognition**: Conducted in-depth analysis of network architectures, different modality combinations, modality fusion strategies, and their robustness to perturbations.

**Teaching Assistant** *Sep. 2018 – Jan. 2020*
*Sharif University of Technology* *Tehran, Iran*

- Teaching assistant for courses in **Advanced 3D computer vision**, **Deep learning**, **Machine learning** and, **Fundamentals of Programming**.

## *Skills*

**Programming Languages**: Python, Matlab, C/C++

**Machine Learning Models**: Diffusion, Flows, Vision Language Models, CNNs, Transformers, Mamba

**Frameworks**: PyTorch, TensorFlow, Keras, OpenCV, Scikit-learn, HuggingFace, Pandas, Weights & Biases

**Tools**: Docker, Git, Linux, PyQt, Slurm, LaTeX

**Languages**: English (fluent), French (basic), Persian (native)

## *References*

References available upon request.