

# 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, ICLR, 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

<b>Ph.D. in Computer Science</b> École de technologie supérieure (ÉTS), Montreal, Canada	Sep. 2021 – Sep. 2025 GPA: 4.3/4.3
• Thesis: Advancing brain MRI assessment using generative models	
<b>M.Sc. in Artificial Intelligence &amp; Robotics</b> Sharif University of Technology, Tehran, Iran	Sep. 2017 – Jan. 2020 GPA: 17.58/20
• Thesis: Human Action Recognition from RGB-D Videos using deep neural networks	

## Work/Research Experience

<b>Machine Learning Researcher</b> Zebra Technologies (Mitacs accelerate program)	Jan. 2026 – present Montreal, Canada
• <b>Industrial Anomaly Detection:</b> Adaptation and improvement of unsupervised anomaly detection methods for industrial inspection under limited supervision (few labeled samples).	
<b>Research Assistant</b> LIVIA @ ÉTS Montreal + CHU Sainte-Justine	Sep. 2021 – Sep. 2025 Montreal, Canada
• <b>Unsupervised Anomaly Detection:</b> Proposed novel generative-model-based frameworks for unsupervised anomaly detection, enabling improved performance on both industrial inspection and medical imaging tasks.	
• <b>Image Translation:</b> Developed unsupervised methods for cross-site MRI harmonization using generative models, enabling more reliable downstream analysis.	
• <b>Vision Language Models:</b> 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.	
• <b>Brain MRI analysis:</b> Proposed learning-based approaches for brain segmentation, neonatal age estimation, and clinical outcome prediction, advancing automated analysis of brain MRIs.	
• <b>Representation Learning:</b> 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.	

<b>Machine Learning Researcher Intern</b> Zebra Technologies	Dec. 2023 – Apr. 2024 Montreal, Canada
• <b>Developed Character Detection for OCR:</b> Developed and optimized a real-time object detection model for industrial OCR and performed comprehensive validation to ensure robustness and reliability.	

<b>Machine Learning Researcher</b> BARAI startup	Aug. 2020 – Aug. 2021 Tehran, Iran
• <b>Clothes visual search:</b> Researched and developed high-performing models for clothes detection, segmentation, and image retrieval for a visual search application, while also creating the dataset.	
• <b>Attribute Tagging:</b> 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.

### Research Assistant

IPL @ Sharif University of Technology

Sep. 2017 – Jan. 2020

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

Sharif University of Technology

Sep. 2018 – Jan. 2020

Tehran, Iran

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

### Selected Publications

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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:** 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.*

### Skills

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

**Core ML Concepts:** Diffusion, Flows, Vision-Language Models, Transformers, CNNs, 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

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References available upon request.