**Peyman Gholami**

CONTACT INFORMATION
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SUMMARY

AI researcher and final-year Ph.D. candidate with industry and academic experience in multimodal foundation models, controllable generative AI, efficient inference, agentic evaluation, and human-centered AI, focused on translating research ideas into practical vision and language systems.

EDUCATION

University of British Columbia

⊙ Ph.D., Computer Science 2021–Present
- ▷ Thesis: *Selective Intervention for Efficient and Controllable Visual Foundation Models*
- ▷ Supervisors: Dr. Leonid Sigal and Dr. Robert Xiao

University of Waterloo

⊙ M.Sc., Vision Science & Systems Design Engineering 2016–2018
- ▷ Thesis: *Computational Methods for Optical Coherence Tomography Image Analysis*

Amirkabir University of Technology (Tehran Polytechnic)

⊙ B.Sc., Biomedical Engineering (with Honours) 2011–2016
- ▷ Thesis: *Vision-Based Wound Geometry Measurement for Bioprinting*

RESEARCH EXPERIENCE

⊙ **Student Researcher, Google**
*Vancouver, BC, Canada* Jan 2026–Sep 2026
- ▷ Research areas: agentic skills, loss-pattern analysis, and benchmarking.
- ▷ Developing reinforcement-learning techniques and hill-climbing optimization for loss-pattern analysis in agentic systems.

⊙ **Student Researcher, Google DeepMind**
*Vancouver, BC, Canada* Sep 2025–Dec 2025
- ▷ Research areas: RLHF, multimodal reasoning, and data valuation.
- ▷ Developed multimodal data valuation methods to improve reasoning-focused model post-training.

⊙ **Ph.D. SWE Intern, Meta**
*Menlo Park, CA, USA* May 2025–Aug 2025
- ▷ Research areas: multimodal LLMs, image understanding, supervised fine-tuning, and grounding.
- ▷ Improved multimodal image understanding through SFT for accurate localization of text and objects in advertising images.

⊙ **Research Intern, Microsoft Research (MSR)**
*Vancouver, BC, Canada* Jul 2024–Nov 2024
- ▷ Research areas: efficient foundation models, adaptive sparse attention, and dynamic inference.
- ▷ Developed adaptive sparse attention for efficient transformer inference.
- ▷ Designed dynamic $k$-selection methods to optimize attention sparsity.

⊙ **Graduate Research Assistant, UBC Vision Group and Multimodal User Experience (MUX) Group**
*Vancouver, BC, Canada* Sep 2020–Present

- ▷ Research areas: multimodal foundation models, generative AI, computer vision, reinforcement learning, and HCI.
- ▷ Built a real-time, layer-based diffusion editor for images and video with masking, visibility controls, and independent layer manipulation.
- ▷ Developed an online data discovery framework for efficient RL post-training of foundation models.
- ▷ Developed representation fine-tuning methods for creative, controllable, & user-centered LLM interactions.
- ▷ Built an autoencoder-based pipeline combining RGB and depth cameras for low-latency, high-frame-rate depth reconstruction.

⊙ **Research Scientist, Lattice Semiconductor (Mirametrix Inc.)**
*Montreal, QC, Canada* Sep 2018–Sep 2020

- ▷ Led R&D for face identification, face alignment, eyelid tracking, and fatigue metrics in the Mirametrix Attention Sensing Engine.
- ▷ Designed multitask neural networks and data pipelines for large-scale computer vision systems.
- ▷ Mentored interns on deep learning and 3D face alignment for automated landmark annotation.
- ▷ Built a ground-truth data collection system to evaluate face & head tracking.

⊙ **Research Assistant: Vision and Image Processing (VIP) Lab, University of Waterloo**
*Waterloo, ON, Canada* Jan 2017–Sep 2018

- ▷ Developed computer vision and machine learning methods for automated retinal OCT analysis.
- ▷ Curated and introduced OCTID, a widely used benchmark dataset for retinal OCT imaging.
- ▷ Built a multi-stage classification pipeline for automated ocular disease detection in OCT scans.

⊙ **Graduate Research Assistant: Theoretical & Experimental Epistemology Lab (TEEL), University of Waterloo**
*Waterloo, ON, Canada* Sep 2016–Sep 2018

- ▷ Designed and conducted psychophysics experiments on relative judgment, motion coherence, and reverse-phi motion perception.
- ▷ Developed an active-contour method with dynamic-programming initialization for automated retinal layer segmentation.

## Publications

⊙ **P. Gholami**, R. Xiao, and L. Sigal, "Ansight: Answer-Sensitive, Spatially Diverse Visual Token Pruning." *Under submission, ICLR 2026.*

⊙ **P. Gholami**, S. Chandhok, S. Malekmohammadi, S. Shams, R. Xiao, and L. Sigal, "DISCOVER: Online Variance-Guided Data Discovery for Budgeted Multimodal GRPO." *Proceedings of the Conference on Neural Information Processing Systems (NeurIPS)*, 2026.

⊙ **P. Gholami** and R. Xiao, "Streamlining Image Editing with Layered Diffusion Brushes," in *Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV)*, 2025, pp. 17368–17378.

- X. Huang, D. Frehlich, K. Xia, **P. Gholami**, and R. Xiao, "GaussianNexus: Room-Scale Real-Time AR/VR Telepresence with Gaussian Splatting," to appear in *Proceedings of the ACM Symposium on User Interface Software and Technology (UIST)*, 2025.
- **P. Gholami** and R. Xiao, "Diffusion Brush: A Latent Diffusion Model-based Editing Tool for AI-generated Images," 2023, arXiv:2306.00219.
- **P. Gholami** and R. Xiao, "AutoDepthNet: High Frame Rate Depth Map Reconstruction using Commodity Depth and RGB Cameras," 2024, arXiv:2305.14731.
- **P. Gholami**, P. Roy, M. K. Parthasarathy, and V. Lakshminarayanan, "OCTID: Optical Coherence Tomography Image Database," *Computers & Electrical Engineering*, vol. 81, 106532, 2020. arXiv:1812.07056.
- A. Gueddana, **P. Gholami**, and V. Lakshminarayanan, "Can a Universal Quantum Cloner Be Used to Design an Experimentally Feasible Near-Deterministic CNOT Gate?" *Quantum Information Processing*, vol. 18, no. 7, 221, 2019.
- **P. Gholami**, M. Sheikh-hasani, M. K. Parthasarathy, J. Zelek, and V. Lakshminarayanan, "Classification of Optical Coherence Tomography images for diagnosing different ocular diseases," in *Proc. SPIE BiOS 10483: Multimodal Biomedical Imaging XIII*, 1048705, 2018.
- **P. Gholami**, P. Roy, M. K. Parthasarathy, J. Zelek, and V. Lakshminarayanan, "Intra-retinal segmentation of Optical Coherence Tomography images using active contours with a dynamic programming initialization and an adaptive weighting strategy," in *Proc. SPIE 10487: Optical Coherence Tomography and Coherence Domain Optical Methods in Biomedicine XXII*, 104832M, 2018.
- P. Roy, **P. Gholami**, M. K. Parthasarathy, J. Zelek, and V. Lakshminarayanan, "Automated intraretinal layer segmentation of Optical Coherence Tomography images using graph-theoretical methods," in *Proc. SPIE BiOS 10483: Optical Coherence Tomography and Coherence Domain Optical Methods in Biomedicine XXII*, 104832U, 2018.
- **P. Gholami**, M. A. Ahmadi-Pajouh, N. Abolfathi, G. Hamarneh, and M. Kayvanrad, "Segmentation and Measurement of Chronic Wounds for Bioprinting," *IEEE Journal of Biomedical and Health Informatics*, vol. 22, no. 4, pp. 1269–1277, 2017.
- **P. Gholami** and S. Gorji Kandi, "Color Extraction of Textured Images using Discrete Wavelet Transform," in *Proceedings of the 6th International Congress on Color and Coating (ICCC)*, Tehran, pp. 77–78, 2015.

## Honors & Awards

- Four Year Doctoral Fellowship (4YF), UBC 2022–2026
- Faculty of Science PhD Award, UBC 2026
- President's Academic Excellence Ph.D. Award, UBC 2022, 2024, 2025, 2026
- Best Demo Award: Layered Diffusion Brushes, ICCV 2025
- Mitacs Accelerate Research Grant, UBC & Rogers Communications 2023–2024
- Best Graduate Seminar Award, UW School of Opt. & Vision Science 2018
- UWaterloo International Master's Student Award 2016–2018
- UWaterloo Science Graduate Student Award 2016–2018

- ⊙ Best Undergraduate Thesis Award, AUT Biomedical Eng. Department 2016
- ⊙ Ranked in the top 0.2% among approximately 360,000 participants in the Iranian University Entrance Exam in Mathematics & Physics 2011

## Teaching Experience

- ⊙ **Teaching Assistant, University of British Columbia**
  - ▷ Advanced Machine Learning (CPSC 540): 2021, 2023, 2024, 2025
  - ▷ Machine Learning (CPSC 340): 2020, 2021, 2022 (lead TA), 2024, 2025
  - ▷ Applied Machine Learning (CPSC 330): 2022, 2023 (lead TA)
  - ▷ Computational Thinking (CPSC 100): 2021, 2022 (lead TA)
  - ▷ Computer Vision (CPSC 425): 2021
  - ▷ Basic Algorithms and Data Structures (CPSC 221): 2023
- ⊙ **Teaching Assistant, University of Waterloo**
  - ▷ Visual Optics: 2017, 2018
  - ▷ Ophthalmic Optics I: 2016, 2017
- ⊙ **Workshop Instructor**
  - ▷ Python Programming: Applied AI and Machine Learning
  - ▷ LaTeX writing workshop for science students

## Service & Reviewing

- ⊙ **Peer Reviewer**
  - ▷ Conference on Neural Information Processing Systems (NeurIPS), 2026
  - ▷ IEEE/CVF International Conference on Computer Vision (ICCV), 2025
  - ▷ European Conference on Computer Vision (ECCV), 2024
  - ▷ IEEE/CVF Winter Conference on Applications of Computer Vision, 2023
  - ▷ ACM Symposium on User Interface Software and Technology (UIST), 2023
  - ▷ Computer Methods in Biomechanics and Biomedical Engineering: Imaging & Visualization (Taylor & Francis), 2019
  - ▷ Journal of Medical Imaging (JMI), 2018
  - ▷ Biomedical Optics Express (Optica), 2018
  - ▷ Heliyon (Elsevier), 2018
  - ▷ Burns & Trauma (Springer), 2018
- ⊙ Reading Group Organizer, MLHCI & HCAI-rg at UBC 2022–2023
- ⊙ Student Volunteer Captain, MobileHCI 2022
- ⊙ Vice President, UBC Iranian Student Association 2021

## Technical Skills

- ⊙ **Programming:** Python, C++, JavaScript
- ⊙ **ML Frameworks:** PyTorch, TensorFlow/Keras, Hugging Face Transformers, Diffusers, scikit-learn, TensorRT
- ⊙ **Vision Tools:** OpenCV, image/video processing pipelines, depth/RGB reconstruction, medical-image analysis
- ⊙ **Infrastructure:** Google Cloud, Microsoft Azure, AWS, HPC/cluster computing, Linux
- ⊙ **Research Tools:** Git/GitHub, MATLAB, LaTeX