

Peyman Gholami

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HIGHLIGHTS OF QUALIFICATIONS

- 10 years of work and research experience in the fields of artificial intelligence, human computer interaction, and computer vision
- Strong computer programming skills in multiple programming languages and simulation tools
- Excellent verbal and written communication skills as evidenced by strong publication record and teaching experiences
- Highly experienced in inventing, training, and analysing deep network models for vision and language problems, demonstrated through the accomplishment of several projects and publications

EDUCATION

PhD. in Computer Science <i>University of British Columbia</i>	Sep 2020 - present BC, Canada
M.Sc. in Vision Science and System Design Engineering <i>University of Waterloo</i>	Sep 2016 - Aug 2018 ON, Canada
B.Sc. in Biomedical Engineering (with honors) <i>Amirkabir University of Technology (Tehran Polytechnic)</i>	Sep 2011 - May 2016 Tehran, Iran

RELATED EXPERIENCES

University of British Columbia **Vancouver, BC, Canada**
Graduate Research Assistant: XLAB - Multimodal User experience (MUX) Group *Sep 2020 - present*

- **Research Areas:** AI generative models, Computer Vision, HCI, Multi-modal Learning, NLP
- **Selected Projects:**
 - ▷ **DiffusionBrush: A Latent Diffusion Model-based Editing Tool for AI-generated Images**
Developed localized conditional denoising diffusion models for customizable image generation. (*submitted to WACV 24*) <https://arxiv.org/abs/2306.00219>
 - ▷ **AutoDepthNet: High FPS Depth Map Reconstruction using Commodity Depth & RGB Cameras**
Created a framework consisting of a hybrid camera setup and an auto-encoder architecture for reconstructing low-latency, high-speed depth maps. (*submitted to IEEE TVCG*) <https://arxiv.org/abs/2305.14731>
 - ▷ **Temporal Upsampling of Video object Segmentation Datasets**
Designed and implemented a framework to obtain intermediate annotations in sparse Video object segmentation datasets with high frame rate and comparable accuracy.
 - ▷ **Fine Tuning Embedding Space for Intercommunication of Large Language Models**
Designed a protocol for optimizing and merging embedding spaces in LLMs to create novel concepts and intercommunication purposes.

Mirametrix Inc. **Montreal, QC, Canada**
Research Scientist *Sep 2018 - Sep 2020*

- Principle investigator for several components of the Mirametrix **Attention Sensing Engine**, e.g., **face alignment**, face recognition, eyelids, and fatigue metrics
- Designed various multi-task neural network architectures and developed analytical solutions for handling large-scale datasets
- Mentored and defined projects for several interns working on deep learning and computer vision, e.g., deep 3D face alignment for automatic labeling of facial landmarks

Vision and Image Processing (VIP) Lab, University of Waterloo

ON, Canada

Research Assistant

Jan 2017 - Sep 2018

- Developed novel image processing and ML algorithms for the analysis of various types of medical images
- Collected and built a big database of retinal images and constructed a platform for training deep neural networks for tracking retinal health

Selected Project: *Fully automated identification of ocular diseases*

- Designed a multi-phase classifier for the classification of OCT images and identifying and grading different ocular diseases
 - ▷ **Related Publication:** P. Gholami, et al., "Classification of Optical Coherence Tomography images for diagnosing different ocular diseases", in *Proc. SPIE BiOS 10483: 1048705*, 2018.

Theoretical & Experimental Epistemology Lab (TEEL), University of Waterloo

ON, Canada

Research Assistant

Sept 2016 - Sep 2018

- Designed and implemented several visual perception experiments, e.g., relative judgment for autistic subjects, motion coherence, reverse phi phenomenon, etc.

Selected Project: *Fully automated segmentation of retinal layers in OCT images*

- Formulated and introduced a novel active contour-based image segmentation algorithm
- Designed and created a semi-automatic software for determining ground truth delineations by clinicians
 - ▷ **Related Publication:** P. Gholami, et al., "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*, 2018.

Diabetes & Metabolic Diseases Clinic, Endocrinology Research Institute

Tehran, Iran

Research Assistant

Nov 2015 - Aug 2016

- Designed and prototyped a visual feedback for controlling bioprinter robot
- Proposed a computer vision protocol for wound depth estimation using disparity map
- Simulated and designed a control system model for bioprinter robot movement by supervising a group of 5

Selected Project: *Bioprinting of chronic wounds*

- Created a computer-aided system for the measurement of wound geometry
- Developed the first scheme for the healing of chronic wounds using bioprinting
 - ▷ **Related Publication:** P. Gholami, et al., "Segmentation and Measurement of Chronic Wounds for Bioprinting." *IEEE journal of biomedical and health informatics*, 2017.

General Electric Healthcare (TPPGE)

Tehran, Iran

Intern

Summer 2014 & 2015

- Assisted on the installation, trouble shooting, and maintenance of different medical imaging devices, e.g. MRI, CT Scan, XRay at the customer service department.
- Administrated the safety standards of medical devices at the sales and marketing department

TEACHING EXPERIENCES

Teaching Assistant

• University of British Columbia, Computer Science Department

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|---|------------|----------------------------------|-----------|
| ▷ Applied Machine Learning - <i>lead TA</i> | 2022,2023 | ▷ Computer Vision | 2021,2022 |
| ▷ Computational Thinking - <i>lead TA</i> | 2021, 2022 | ▷ Advanced Machine Learning | 2021 |
| ▷ Machine Learning - <i>lead TA</i> | 2020, 2022 | ▷ Data Structures and Algorithms | 2023 |

• University of Waterloo Visual Optics I & II, Ophthalmic Optics 2016 - 2018

- ▷ Demonstrated the theory and procedure of lab tutorials for Optometry Doctorate (OD) students.
- ▷ Analyzed the performance of more than 150 students and providing effective feedback

• Amirkabir UoT Medical Imaging, Computer Programming (C++) 2014, 2015

- ▷ Simplified illustrating sophisticated medical imaging concepts for students by using different means of media, resulting in 20% increase in the average of the class.

Workshop Instructor: General and advanced Matlab Course, Digital Image Processing, L^AT_EX writing

TECHNICAL SKILLS

- Programming languages: **C++**, **Python**
- AI Packages, and Libraries: Tensorflow/Keras, Pytorch/Torch, Scikit-learn, Open CV, R, Pandas
- Cloud computing platforms: Google Cloud, Microsoft Azure, AWS, UBC ARC Sockeye
- Version controls: GitHub, Perforce • Operating Systems: Linux, Windows, OS X
- Engineering tools and Software: ▷ Labview ▷ Altium Designer ▷ Keil (ARM)
 ▷ MATLAB: General Matlab, DIP, DSP, Simulink, SISOTOOL, Psychtoolbox
- General Software Packages: Microsoft Office, L^AT_EX, Adobe Photoshop, Adobe Audition

ADDITIONAL EXPERIENCES

- **Several study excellence awards and scholarships, including:**
 - ▷ Four Year Doctoral Fellowship (4YF) Award, (UBC) 2021-2025
 - ▷ President's Academic Excellence PhD Award, (UBC) 2022
 - ▷ Best Master's Graduate Seminar award (UW School of Optometry & Vision Science) 2018
 - ▷ Best undergraduate thesis award (AUT Biomedical Engineering Department) 2016
 - ▷ International Master's Student Award (UW) 2016 - 2018
 - ▷ Science Graduate Student Award (UW) 2016 - 2018
- **Peer reviewer** Several high impact journals and conferences 2018 - present
- **Reading Group Organizer** MLHCI & HCAI-rg at UBC 2022 - present
Deep Learning Reading Club at UWaterloo 2017 - 2018
- **Student Volunteer Captain** MobileHCI conference 2022
- **Vice President** Iranian Student Association of UBC 2021
- **Supervisor & Editor** Tapesh Journal, The official journal of BME department 2014-2016
- **Executive committee leader** Iranian Conference on Biomedical Engineering (ICBME) 2012,2014
- **Director** Amirkabir University Music House 2012-2013
- **Technical certificates** ISO 13485 Internal Audit Training Course 2014
Technical Observers of Medical instruments Training Course 2013