

Koorosh Roohi

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EDUCATION

- **University of Toronto** Toronto, Canada
Ph.D. in Biomedical Engineering (Supervisor: Prof. Roshan Fekr and Mihailidis) Sep 2023 - Nov 2028 (expected)
 - **GPA:** 4/4 (A+)
 - **Dissertation Title:** Infection Risk Estimation via Multi-modal Sensing and Deep Learning in Healthcare
- **Amirkabir University of Technology, (Tehran Polytechnic)** Tehran, Iran
B.Sc. in Computer Engineering Sep 2018 - Mar 2023
 - **GPA:** 3.85/4 ≈ 18.26/20

RESEARCH EXPERIENCE

- **Research Assistant at University of Toronto** Toronto, Canada
Under the supervision of Prof. Roshan Fekr and Mihailidis Apr 2023 - Present
 - Developing novel deep learning models to **quantify infection exposure risk** in real-time healthcare settings using **indoor localization** and **activity recognition**.
 - Fusing multi-modal sensor data (**mmWave radar**, RGB-D, IMU, BLE) to build robust environmental and motion-capture datasets for [e.g., training/validation].
 - Proposed a novel **multi-modal fusion architecture** that dynamically enhances **mmWave radar**-based activity recognition, achieving around **5%** higher accuracy than single-modality models.
 - Designed and trained **PyTorch**-based neural networks, implementing real-time wireless data processing pipelines for on-device sensing.
- **Research Assistant at Amirkabir University of Technology** Tehran, Iran
Under the supervision of Prof. Safabakhsh Dec 2021 - Mar 2023
 - Developed a **gait-based person re-identification** system using deep CNNs and **HPM** layers, achieving **86%** accuracy on the **OUMVLP-Pose** dataset.
 - Implemented **triplet loss** for robust feature learning and deployed **YOLOv5** with **DeepSort** for real-world, multi-object tracking.

WORK EXPERIENCE

- **AI Manager at Masterly Inc.** Toronto, Canada
AI-powered software solutions Nov 2023 - Present
 - Led the end-to-end development of **Masterly Forms**, an AI-powered data platform; helping organization with collaborative and AI-based suggestions for filling out the forms and creating them.
 - Engineered **Masterly Earendel**, a **VLM**-based video analysis system that automatically detects critical events, generating real-time alerts to reduce manual review in an agentic structure.
 - Leading development of **Masterly FinSuite**, an **LLM**-driven financial portal to automate reporting and provide decision support.
 - Deployed and manage scalable, production-level AI infrastructure on **AWS** (SageMaker, Bedrock, Lambda, EC2).
 - Supervised a team of **5** developers, delivering **2** production-ready AI modules (PyTorch, .NET).
- **Software Engineer at Crouse Company's Research & Innovation Department** Tehran, Iran
Computer Vision Specialist (Part-time) Mar 2022 - Jun 2022
 - Built an **OpenCV**-based computer vision pipeline for **defect detection in car displays**, improving quality inspection accuracy over manual methods.
 - Implemented **Isolation Forest** and **Tesseract OCR** for pixel-level anomaly detection, successfully identifying of **5** defects.
- **Client Developer at Quiz of Kings Studio** Tehran, Iran
Unity Game Engine Developer (Part-time) Nov 2019 - Mar 2022
 - Contributed to client-side development for **Quiz of Kings**, Iran's most popular mobile game with **100k+** active users.
 - Led the migration of legacy code from **Corona** to **Unity**, boosting performance and maintainability of the final product.

PUBLICATIONS & PRESENTATIONS

- [Published] **Roohi, K.**, & Roshan Fekr, A. (2026). "Comparative Analysis of Deep Learning Models for Real-time Nursing Activity Recognition." *Machine Learning: Health (IOP)*.
- [Published] **Roohi, K.**, & Roshan Fekr, A. (2025). "A Comparative Analysis of Indoor Localization Technologies: A Review of Literature." *Computer Networks (Elsevier)*.
- [Published] **Roohi, K.**, Esmaeilzahi, A., & Ahmad, M. O. (2025). "FUVT: A Deep Few-shot Unsupervised Learning-based Video-to-Video Translation Scheme using Kalman Filtering and Relativistic GAN." *Signal, Image and Video Processing (Springer)*.
- [Oral Presentation] **Roohi, K.**, & Roshan Fekr, A. (2025). "Using mmWave Radar and Deep Learning to Classify Caregiver Activities for Infection Prevention" *The Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*.
- [Under Review] **Roohi, K.**, & Roshan Fekr, A. "A Real-Time Caregiver Activity Recognition with Potential for Infection Prevention in Hospitals." *Smart Health (Elsevier)*.

HONORS, AWARDS & PROFESSIONAL SERVICE

- **EPIC Doctoral Award (\$10,000 CAD)**, Emerging and Pandemic Infections Consortium (EPIC) (Jan 2025).
- **Peer Reviewer**, *Circuits, Systems, and Signal Processing (CSSP)* journal (**12 reviews completed**).
- **Ranked 193rd / 140,000 Applicants**, Nationwide University Entrance Exam (Jul 2018).

TECHNICAL SKILLS

- **AI & Deep Learning**: PyTorch, TensorFlow, State Space Models (Mamba4D), Diffusion Transformers (DiT), Vision-Language Models (VLMs), Multi-Agent Systems (MCP), Spatio-Temporal Modeling
- **3D Vision & Sensing**: 3D Point Clouds, 3D Object & Scene Understanding, mmWave Radar Signal Processing, Sensor Fusion (IMU/BLE), Computer Vision (YOLO, DeepSORT, OpenCV)
- **MLOps & Infrastructure**: AWS (SageMaker, Bedrock, EC2), Docker, Git, Linux, Real-time Inference, REST APIs
- **Languages & Data Science**: Python, C#, .NET, SQL, Pandas, NumPy, scikit-learn, Advanced Signal Processing

TEACHING EXPERIENCES

- **Teaching Assistant (Tutorial TA), University of Toronto - Department of Computer Science**: System Programming (Winter 2025, Winter 2026), Microprocessor Systems (Winter 2024), Software Design (Fall 2023, Fall 2024, Fall 2025)
- **Head Teaching Assistant, Amirkabir University of Technology - Department of Computer Engineering**: Principles of Artificial Intelligence (Fall 2022, Spring 2022), Programming Languages (Fall 2022), Algorithm Design (Fall 2021), Advanced Programming (Spring 2021), Fundamentals of Programming Lab (Winter 2021)