Pooyan Rahmanzadehgervi

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Birth Date: 24 Aug. 1994 | Nationality: Iran | Current Residence: USA

Education

Auburn University (AU) — Auburn, AL
Ph.D. in Computer Science and Software Engineering — *Aug. 2022 – Present*

Ferdowsi University of Mashhad (FUM) — Mashhad, Khorasan Razavi
Master of Science in Artificial Intelligence and Robotics — *Sep. 2017 – Sep. 2021*
Thesis: *Autonomous Quadrotor Navigation using End-to-End Deep Reinforcement Learning*

Ferdowsi University of Mashhad (FUM) — Mashhad, Khorasan Razavi
Bachelor of Science in Computer Software Engineering — *Sep. 2012 – Sep. 2017*
Thesis: *Training a Two-layer Feed-Forward Perceptron to Obtain a Reliable Initialization for RBF Networks*

National Organization for Development of Exceptional Talents (Sampad) — Babol, Mazandaran
High school Diploma in Mathematics — *Sep. 2008 – Sep. 2012*

Experience

Research Assistant — Aug. 2022 – Present
Auburn University (AU) — *Auburn, AL*

- Vision Language Models with Transformer Attention Bottlenecks for User Interpretability
- Benchmarks and Evaluation Methods for SotA Vision Language Models

Teaching Assistant — Aug. 2022 – Present
Auburn University (AU) — *Auburn, AL*

- **Machine Learning**
  - *Jan. 2023 – Present*
  - **Course Syllabus**: *Perceptrons, Bayes, Logistic Regression, Linear Regression, SVMs, Kernels, Classification and Regression Trees, Ensemble Models, PCA*
  - Grading the assignments, Providing assistance to students with both theoretical and practical assignments
- **Intro to Computer Science II**
  - *Aug. 2022 – Dec. 2022*
  - **Course Syllabus**: *Java programming language*
  - Grading the assignments, Providing assistance to students with both theoretical and practical assignments

Machine Learning Engineer — Sep. 2021 – April 2022
Polaris LTD. — *Mashhad, Khorasan Razavi*

- As an ML Engineer and Data Scientist, I developed novel data visualization methods for financial markets. I was also a lead researcher in the company.

Teaching Assistant — Jan. 2014 – Sep. 2021
Ferdowsi University of Mashhad (FUM) — *Mashhad, Khorasan Razavi*

- **Electrical Circuits**
  - *Jan. 2014 – Dec. 2016*
  - **Course Syllabus**: *Circuit Analysis, RL and RC Circuits, RLC Circuits, Sinusoidal Steady-State Analysis, Magnetically Coupled Circuits*
  - Providing assignments to the class, Instructing TA sessions
- **Advanced Artificial Intelligence**
  - *Sep. 2018 – Jan. 2019*
  - **Course Syllabus**: *Classical Planning, Bayesian Networks, Decision Theory, Motion Planning, and Discretizing*
  - Providing both theoretical and programming assignments to the class, Instructing practical sessions
- **Fundamentals of Robotics**

- *Jan. 2019 – July 2019*
- **Course Syllabus**: *Transformations, Manipulator Kinematics, Singularity and Trajectory Generation, Mobile Robot Locomotion, Mobile Robot Kinematics, and Sensors*
- Providing both theoretical and programming assignments to the class

- **Advanced Topics in Artificial Intelligence**
  - *Jan. 2020 – July 2021*
  - **Course Syllabus**: *Introduction to RL, Markov Decision Process, Value-Based RL, Policy-Based RL, Actor-Critic, Model-Based RL, Games, and Classic Problems, Introduction to DRL, Policy Optimization, Deep Q-Networks, Value Prediction, Actor-Critic Architecture, Imitation Learning, Inverse RL*
  - Guest lecturer, Providing both theoretical and programming assignments to the class, Instructing practical sessions

Internship June 2015 – Sep 2015

Telecommunication Company of Babol *Babol, Mazandaran*

- **Database Expert**: Providing technical support and maintenance for SQL database.

Freelance Programming August 2013 – Sep 2020

- *Lossless Bayes Estimator*
- *Traffic Light Scheduling using Reinforcement Learning*
- *Inventory Management using SQL*
- *Data Visualization in Python*

Publication

- **TAB: Transformer Attention Bottlenecks enable User Intervention and Debugging in Vision-Language Models**
  - *arXiv pre-print (2025)* [link]
- **Improving Zero-Shot Object-Level Change Detection by Incorporating Visual Correspondence**
  - *Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision (WACV 2025)* [link]
- **Vision Language Models are blind**
  - *Proceedings of the 17th Asian Conference on Computer Vision (ACCV 2024)* [link]
  - *Oral presentation (top 5.6%)*
- **Vision-Based Obstacle Avoidance in Drone Navigation using Deep Reinforcement Learning**
  - *11th International Conference on Computer Knowledge Engineering (ICCKE 2021)* [link]
  - *28-29 Oct. 2021 Ferdowsi University of Mashhad, Iran*
  - *Indexed by IEEE*
  - *Best paper award*

Research Interests

- *Vision Language Models*
- *Explainable AI*
- *Deep Learning*

Press Coverage

- 2024: **TechCrunch** Are 'visual' AI models actually blind?
- 2024: **Tech Xplore** Visual abilities of language models found to be lacking depth
- 2024: **ars Technica** Can you do better than top-level AI models on these basic vision tests?
- 2024: **TechSPOT** Study shows the best visual learning models fail at very basic visual identification tests
- 2024: **News Bytes** Whatever be the claims, AI models can NOT actually see

Skills

Research: Multimodal Learning, Reinforcement Learning, Deep Learning, Deep Reinforcement Learning, Robotics and Control, Optimization and Mathematics, Computer Vision
Programming: Python, C++, Java, MATLAB
Library and Technical Toolbox: Pytorch, Tensorflow, Keras, Anaconda, Scikit-Learn, Pandas, Pygame, Matplotlib, NumPy, Sympy, Scipy
Simulator and Engine: OpenAI-Gym, Robotics Operating System, Gazebo, Mujoco, Unity
Job Related: Teamwork, Documentation, Fast Learner, Time Management
Software and Productivity: Git, LateX, Office, Adobe Photoshop, Adobe Premiere

Activities

- **K6-AI Club Instructor**
  - *Introducing a cutting-edge Artificial Intelligence application or a core AI concept to students.*
  - *Creating and solving coding challenges using robots/computers.*
- **Conference Reviewer**
  - *9th International Conference on Computer Knowledge Engineering (ICCKE 2019), Mashhad, Iran. (Indexed by IEEE)*
  - *13th International Conference on Computer Knowledge Engineering (ICCKE 2023), Mashhad, Iran. (Indexed by IEEE)*
  - *The IEEE/CVF Conference on Computer Vision and Pattern Recognition 2025*
- **SSCES Member**
  - *Member of the "Scientific Society of Computer Engineering Students" at Ferdsowsi University of Mashhad, Iran. (August 2013 - September 2014)*

Awards

- AU Charles Gavin Research Fellowship: Awarded in May 2022.
- Qualified in the first stage of the National High School Olympiad of Physics.

Language

English
Fluent

Persian
Native