Fatemeh Sarshartehrani
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Education

- **Virginia Tech** — Expected Graduation: May. 2026
  Ph.D. Student in Computer Science — Advisor: Dr. Denis Gracanin
- **Sharif University of Technology** — Graduation: Aug. 2022
  M.Sc. in Artificial Intelligence — Advisor: Dr. Ali Movaghar
- **Tehran University** — Graduation: Sep. 2019
  B.Sc. in Engineering Physics — Advisor: Dr. Farrokh Sarreshtedari

Publications

1. F. Sarshartehrani, .et al. "Towards immersive cybersecurity workforce development for mission-critical IoT Systems." 2024 IEEE 15th Annual Ubiquitous Computing, Electronics & Mobile Communication Conference (UEMCON). IEEE, (2024).
2. F. Sarshartehrani, .et al. "Enhancing E-Learning Experience Through Embodied AI Tutors in Immersive Virtual Environments: A Multifaceted Approach for Personalized Educational Adaptation.", *HCI International Conference '26th Proceedings of the HCI International*, (2024).
3. F. Sarshartehrani, et al. "Receptivity: Fostering Respectful Conversations in the Digital Public Sphere", *HCI International Conference '26th Proceedings of the HCI International*, (2024).
4. Masrourisaadat, Nila, et al. "Analyzing quality, bias, and performance in text-to-image generative models." arXiv preprint arXiv:2407.00138 (2024).
5. E. Mohammadrezaei, M. Behravan, F. Sarshartehrani, et al. "VividVR: Real-Time Optimization of Dynamic Light Probe Placement for Enhanced Visual Fidelity in VR Environments; Using SVM and Random Forest under Changing Conditions"
6. E. Mohammadrezaei, F. Sarshartehrani, et al. "Exploring the Effectiveness of Augmented and Virtual Reality for Visualizing Complex Lighting Simulation Data structures and Evaluating User Experience", *HCI International Conference '26th Proceedings of the HCI International, accepted as a poster*, (2024).
7. P. Dongre, A. Kharel, K. Gupta, F. Sarshartehrani, M. Billinghurst, and D. Gračanin, "Designing Biocybernetic Adaptations: A Systematic Literature Review of Machine Learning Approaches for Affect Recognition and Design Principles for Affect-Aware Adaptive Systems," *IEEE Transactions on Affective Computing*, (Submitted, Under Review), 2025.

Projects

Enhancing E-Learning Experience Through Embodied AI Tutors in Immersive Virtual Environments

- Developed an emotionally adaptive AI tutor in VR for personalized learning, integrated with GPT-3.5 in Unity. Evaluated effectiveness using engagement metrics and learning outcomes.

Mini Arithmetic Expression Compiler and Processor for Lisp (Java)

- Developed a mini arithmetic expression compiler for Lisp, focusing on tokenization, expression evaluation, and nested expression handling.

Mini Social Networking App (Java)

- Developed a mini social networking application, using graph data structures to represent and manage user profiles and their relationships.

Movie Industry Analysis Tool (Python, D3.js, Tableau)

- Analyzed movie industry data, focusing on key performance indicators. Created interactive visualizations and conducted user studies to identify key collaborators in the movie industry whose participation leads to higher box office revenues and/or higher ratings.

Analysis of Text-to-Image Models (Python, GANs, Diffusion Models, Transformer-based Models)

- Analyzed various text-to-image models including Stable Diffusion, Dall-E 2, Dall.E Mini, LAFITE, and Cogview2.

Mobile Application (Swift)

- *iOS Group Discussion App:* Real-time signal exchange for group discussions.

Computer Vision (Python)

- *Face Mask Detection and Emotion Recognition:* Accurate detection of masked faces. Recognized human emotions and performed face detection.

Software Development (C++, Java)

- *English-Farsi Translator (C++):* Designed an English-Farsi translator with grammar check.
- *File Compression (Java):* Created a file compression tool in Java.

Text to Image and Image to Text Mapping (Python)

- Generated text descriptions for detected objects in images. Detected objects in images for given text descriptions.

Digital Signal Processing (MATLAB)

- Implemented steganography in audio and image data. Conducted object detection in images using correlation. Performed audio signal up-sampling and down-sampling.

Lattice Percolation (Python)

- Simulated percolation and spanning clusters in a 2D lattice. Evaluated conductivity near the percolation threshold.

Radiomics (MATLAB)

- Extracted features from medical images. Recognized correlations between the images and the clinical data.

Skills

Programming Languages: Python (TensorFlow, PyTorch, Scikit-learn, NumPy, Pandas, Matplotlib, Keras, OpenCV, Natural Language Toolkit (NLTK), Flask, NetworkX), Java, Matlab, C/C++, JavaScript, R, HTML/CSS, SQL, Octave, Raspberry Pi
Source Control Protocols: Git
Operating Systems: Windows, Linux (Ubuntu)
Software/Tools/Databases: PyCharm, IntelliJ Idea, CLion, Eclipse, MS Visual Studio, MySQL
Web Technologies: HTML & CSS, JavaScript
Software Paradigms: Object-Oriented Programming, Functional Programming

Work Experience

- **Graduate Research Assistant – Receptivity Project** Summer 2023 – Summer 2024
  - Designed and developed **Receptivity**, an interactive feedback system for group discussions, using React.js for the web version in 2024.
  - Engineered the iOS application for Receptivity in 2023, utilizing **Swift** to implement real-time feedback functionalities.
  - Integrated MQTT messaging protocol for seamless communication between users, ensuring low-latency feedback transmission.
  - Conducted usability testing and iterated on UI/UX improvements to enhance user experience across web and mobile platforms.
  - Collaborated with faculty and research teams to align development efforts with research objectives.
- **Graduate Research Assistant** Sep. 2019 - May 2022
  - Identified key research problems aligned with the team's focus, leading to published papers in top-tier conferences.
  - Gathered and analyzed data using Python. Solved complex research problems, analyzed findings, and evaluated results.

- Implemented research solutions, and prepared comprehensive research reports and manuscripts, contributing to three accepted conference papers.

- **Graduate Teaching Assistant** Fall 2022 – Spring 2023, Fall 2024 – Spring 2025
  - Instructed lab sessions for undergraduate courses, guiding students through hands-on programming exercises and software development principles.
  - Graded assignments and projects, providing detailed feedback to enhance student learning outcomes.
  - Developed instructional materials, including lab slides and tutorials, to reinforce theoretical concepts with practical applications.
  - Provided one-on-one support during lab sessions and office hours, clarifying complex topics and assisting students with debugging and problem-solving.

- **Instructor for "Intermediate Programming In Python" Course** Jan. 2024 – May 2024
  - Developed a learning-focused environment by implementing interactive coding sessions.
  - Monitored the progress of 90 students using weekly assessments and tailored instruction based on performance analytics.
  - Guided students through individual projects and assignments.

- **Instructor for "Introduction to Software Engineering" Course** Aug. 2023 - Dec. 2023
  - Delivered lectures to 40 students, utilizing interactive teaching methods.
  - Designed and developed instructional materials, leading to a 20% improvement in student understanding as reflected in mid-term evaluations.
  - Provided guidance and organized office hours, resulting in an increase in student attendance and participation in office hours.

- **Contribution in Graph Theory Association** Jul. 2021
  - Developed and delivered instructional materials. Engaged students with interactive problem-solving sessions.

- **English Teacher** Feb. 2017 – Jan. 2018
  - Taught English, utilizing multimedia tools to improve reading, writing, and speaking skills. Developed tailored lesson plans and materials.

- **Tutor** Feb. 2016 – Sep. 2016
  - Taught Math and Physics, employing interactive teaching methods that improved student exam scores by 20%.
  - Customized teaching methods based on individual needs, resulting in an improvement in student understanding and grades.

- **Teacher and Student Advisor** Jul. 2014 – May. 2015
  - Taught Math and Physics, integrating practical experiments to enhance understanding. Provided academic consulting, developing individualized study plans that improved student performance by 15%.