

AMIR RADMEHR

Amherst, MA

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Education

University of Massachusetts Amherst

PhD in Computer Science

Amherst, MA

University of Tehran

Bachelor of Science in Electrical Engineering

Tehran, Iran

Research Interests

- Cyber-Physical Systems
- Robotics
- Internet of Medical Things
- Mobile, Wearable and Ubiquitous Technologies
- Embedded Systems
- Machine Learning and Intelligent sensors

Publications

- [1] Bhawana Chhaglani, Abdul Aziz, **Amirmohammad Radmehr**, Joseph Collins, Jeremy Gummeson, Sunghoon Ivan Lee, Ravi Karkar, and Phuc Nguyen. “Hardware-Assisted Privacy-Preserving Multi-Channel EEG Computational Headwear”. In: *2024 IEEE 20th International Conference on Body Sensor Networks (BSN)*. IEEE. 2024.
- [2] Zhizhang Hu*, **Amirmohammad Radmehr***, Yue Zhang, Shijia Pan, and Phuc Nguyen. “IOTeeth: Intra-Oral Teeth Sensing System for Dental Occlusal Diseases Recognition”. In: *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (*Co-first authors)* 8.1 (2024), pp. 1–29.
- [3] Neel Vora*, Amir Hajighasemi*, Cody T. Reynolds, **Amirmohammad Radmehr**, et al. “A Platform-Agnostic Physiological Signal Compression Approach for Resource-Constrained Computational Headwear”. In: *2024 IEEE 20th International Conference on Body Sensor Networks (BSN)*. IEEE. 2024.
- [4] **Amirmohammad Radmehr**, Milad Asgari, and Mehdi Tale Masouleh. “Experimental Study on the Imitation of the Human Head-and-Eye Pose Using the 3-DOF Agile Eye Parallel Robot with ROS and Mediapipe Framework”. In: *2021 9th RSI International Conference on Robotics and Mechatronics (ICRoM)*. 2021, pp. 472–478. DOI: 10.1109/ICRoM54204.2021.9663445.

Research Experience

Wireless and Sensor Systems Lab (WSSL)

2023 - Present

Graduate Research Assistant

University of Massachusetts Amherst, Amherst, MA

- Currently working on the development of innovative Blood Pressure (BP) monitoring systems and other health-related wearable technologies. at UMass Amherst

Wireless and Sensor Systems Lab (WSSL)

2022 - 2023

Graduate Research Assistant

University of Texas at Arlington, Arlington, TX

- Obtained knowledge of vibration sensing and piezoelectric sensors. Designed and implemented experiments, ensuring precision and reliability in data collection. Collaborated on developing innovative solutions for wearable systems for the detection of teeth occlusal disease in UT Arlington.

Human and Robot Interaction Lab (Taarlabs)

2020 - 2021

Undergraduate Researcher

Tehran, Iran

- Acquired research skills in the field of robotics within the Human-Robot Interaction (HRI) domain. Successfully executed and concluded my Bachelor’s thesis project, which culminated in the publication of a research paper and showcased my research findings by presenting at the ICROM 2021 conference.

Volunteering Experience

Undergraduate Research Volunteers (URV) CICS, UMass Amherst

2024 – Present

Volunteer Research Member

Remote

- Collaborated remotely across three semesters as part of a team of undergraduates under the mentorship of a PhD researcher.
- Contributed to real-world research via literature reviews, data analysis, coding, and regular meetings with the team.
- Participated in the program’s final poster presentation showcasing project outcomes and learning achievements.

Technical Skills

Languages: Python; *Tensorflow* | *OpenCV* | *Scikit-Learn* | *Pandas*, ... , Embedded C,Cpp; *Arduino* | *ESPIDF*, MATLAB; *Simulink* | *Signal Processing* | *Control System*

Tools: Altium Designer, SolidWorks, RasPi, Jetson Nano, L^AT_EX

Technologies/Frameworks: ROS, Linux, Git

Projects

IOTeeth | *Python, ML, C, SolidWorks*

2022-2023

- Fabricated and deployed PVDF-type sensors in dental retainers.
- Developed ML solution to detect occlusal disease and evaluated the findings on 12 patients.
- Designed and built an impact hammer for sensor characterization.
- Evaluation results showed an F1 score of 0.97 for activity recognition with leave-one-out validation and an average F1 score of 0.92 for dental disease recognition for different activities with leave-one-out validation.

Mail Composer bot | *Python, Google Cloud Console*

September 2021

- Developed a bot using pyTelegramBotAPI and Google Cloud Console to send bulk emails from Google Sheets.
- Established a cloud-based server, enabling the bot to operate seamlessly and be interacted with at any time.
- Implemented various in menu layout for increased interactivity and order customized commands in chat.

Human Head and Eye Imitation Robot | *Python, Mediapipe, C, Opencv, ROS, Arduino*

2020-2021

- Investigated approaches to extract meaningful information from face mesh data for realistic facial mimicry.
- Utilized a 3DOF agile eye parallel robot to simulate human neck movements with three degrees of freedom.
- Fabricated 2DOF animatronic eye using SolidWorks and fabricated the 3D printed parts and
- Explored the application of computer vision and neural networks to calculate the pose of a human face using linear regression and other methods.

Ball and Plate | *SolidWorks, Python, OpenCV, Arduino*

2020

- Fabricated a ball and plate robot using 4 Dynamixel servos and 3D printed arms.
- Developed and implemented a robust PID control system and algorithm for ball detection and precise balancing at the center of the plate.
- Programmed diverse trajectories for the ball, demonstrating different motion paths, including controlled bouncing on the plate.

Line Following Robot | *Altium Designer, CodeVision, ATmega32*

2019

- Fabricated a robot from scratch, including chassis creation, PCB design, and microcontroller programming.
- Integrated six infrared sensors onto a separate PCB, establishing a connection with the main PCB.
- Programmed an ATMEGA 32 microcontroller to process data received from the infrared sensors to respond dynamically to sensor inputs, distinguishing between black and white surfaces.

Relevant Coursework

- Machine Learning
- Artificial Neural Network
- Robotics
- Design and Analysis of Algorithms
- Digital Control Systems
- Microprocessors

Teaching Experience

University of Massachusetts Amherst

2024

Mobile and Ubiquitous Computing

- Conducting tutorial sessions on working with the ESP-IDF framework to develop and program ESP32 microcontrollers.

University of Texas at Arlington

2022

Special Topics in CPS/Networking | *Data Mining*

- Graded homework and projects.

University of Tehran

2020 – 2021

Artificial Neural Networks | *Operation Research* | *Linear Algebra* | *Mechatronics*

- Developed projects and homework for students and addressed students' questions.

Modern Control | *Industrial Control* | *Instrumentation*

- Graded students' assignments and projects and provided assistance and clarification for inquiries in course materials.