Mohamad Reza **Shahabian Alashti**

Ph.D.| Robotics, Machine Learning, HRI

linkedin.com/in/mrshahabian @ shahabian.reza@gmail.com

Google Scholar

As a postdoctoral research fellow in Robotics and Deep Learning at the University of Hertfordshire, I am involved in multidisciplinary projects such as SWAG (Soft Wearable Assistive Garment), funded under the European Horizon program, and the "Hospital at Home" project funded by the NHS. These initiatives focus on advancing healthcare technologies through robotics and AI. I hold a Ph.D. in Computer Science from the same institution, specializing in Robotics, Machine Learning, Human-Robot Interaction (HRI). With a background in Mechatronics and Electronic Engineering, I bring extensive experience in industrial systems, programming, web development, and project management. I have also taught computer science and engineering courses, mentoring students for their academic and professional growth.

Education

2020-May 2024 **PhD in Computer Science**
- Dissertation : investigating the human activity recognition in ambient assisted living scenarios.
- Guidance provided by Prof. Farshid Amirabdollahian, P. Holthaus, and C. Menon as supervisors.
- University of Hertfordshire, Hatfield, UK

2011-2015 **Master of Science in Mechatronics Engineering**
- Dissertation : focusing on the development of an intelligent system for estimating Spinal Cord Injury through the use of medical image segmentation techniques.
- Guidance provided by Professor Mohammadreza Daliri and Dr. Behnam Jamei as supervisors.
- Courses completed include Mechatronics I and II, Advanced Robotics, Advanced Automatic Control, Robot Vision and Navigation, Advanced Engineering Mathematics, Machine Vision, Signal Processing.
- The Final Project received a grade of 19.25 out of 20.
- Azad University (IAU), Qazvin, Iran

2006-2011 **Bachelor of Science in Electronic Engineering**
- Dissertation : focusing on the design and implementation of an advanced path-following robot.
- Guidance provided by Abbas Yaseri as a supervisor.
- Courses completed include Microprocessor, Microcontroller, and Control System.
- The Final Project a grade of 20 out of 20.
- Hadaf University, Sary, Iran

Skills

Programming Languages	Proficient in Python, C, C++, JS, ReactJS, HTML, and CSS.
Frameworks & Libraries	Experienced with PyTorch, Keras, OpenCV, Scikit-Learn, Numpy, Pandas, Streamlit, QT, and Docker, Amazon AWS.
Development Environments	Skilled in PyCharm, Jupyter Notebook, WebStorm, Visual Studio Code, and CPU/GPU Cluster setups.
Deep Learning Techniques	Knowledgeable in CNNs, Transformers, GANs.
Robotics	Experienced with ROS1, ROS2, MoveIt, Navigation, Trajectory Planning, and Object Grasping.
Perception Technologies	Expertise in Human Activity Recognition and Pose Extraction using HrNet and Yolo.
Operating Systems	Familiar with Linux Ubuntu, Windows, and Mac OS X.
Version Control	Skilled in Git, GitHub, and GitLab.
Embedded Systems	Experienced with Raspberry Pi, Arduino, Orange Pi, and various Microcontrollers.
Industrial Automation	PLC & HMI Programming with Delta and Siemense brands, DCS, Schneider & APC Infrastructure Monitoring
Project Management	Skilled in Agile Methodology, Scrum, and Kanban.
Communication	Strong capabilities in Team Collaboration and Academic and Technical Writing.

Experience & Projects

Present
August-2024

Postdoctoral Research Fellow in Robotics and Deep learning, UH, Hatfield

- I am developing advanced intent detection method for the SWAG (Soft Wearable Assistive Garment) project, utilizing human biomechanical data such as electromyography (EMG), IMU, kinetics, and kinematics.
- Actively involving in the "Hospital at Home" project, developing Human-Robot Interaction (HRI) scenarios for assistive robots.

Deep Learning | Robotics | Python | EMG | HAR | HRI | CNN | Transformers

May-2024
December-2020

Research in Skeleton-based Multi-view Human Activity Recognition (HAR), UH, Hatfield

- Development of the Skeleton-based Multi-view AAL dataset (RHM-HAR-SK)
- Conducted both Quantitative and Qualitative Analyses of RHM-HAR-SK
- Introduction of an efficient Multi-view HAR Architecture

PyTorch | Pycharm | Jupyter | MMPOSE | YOLO7 | GPU cluster | HAR | HRI | CNN | Transformers | GAN | GNN

Present
March 2024

Visiting Lecturer, CUL, London

- 402AZ : Serverless Web Application
- 403IT : Problem Solving and Programming
- 401AZ : Principles of Computer Systems
- 402IT : Information Security
- 404AZ : Infrastructure Architecture and Design Concepts

Cloud Computing | AWS | Computer Science | VL

February-2024
September-2022

Exposure Sensing Animated Mannequin (eSAM) | Robotics Engineer, UH, Hatfield

- Designing and manufacturing a life-sized mannequin robot for exposure in chemical environments.
- Development of a web-based user interface for robot control.
- Collecting data and controlling actuators using Raspberry Pi.
- Programming Arduino embedded boards to read data from chemical and environmental sensors, implementing standard protocol (Modbus RTU).
- Setting up and programming Maxon motors and drivers for control and operation.

Python | C | Pycharm | Arduino | Raspberry Pi | Control system | Fusion360 | Linux | Maxon

December 2022

Data Study Group (DSG)| Facilitator, Alan Turing Institute | AMRC, London

Implementing data augmentation and synthetic data generation techniques to address issues related to low frequency and sparse data (Project Link).

Python | Data Analysis | PCA | SVD

Present
June 2021

Visiting Lecturer, UH, Hatfield

- 6COM2021 : Software Engineering Project (BCs Supervision)
- 7COM1085 : Research Methods
- 7COM1084 : Advanced Research Topics in Computer Science
- 7COM1039 : Advanced Computer Science Maters Project(Thesis supervision)
- 5COM2005 : Database Systems
- 4COM1035 : Human Dimensions of Computing

Computer Science | VL

January 2022
September 2021

Visiting Lecturer, Uxbridge College, Uxbridge

- Renewable Energy and Power Electronics
- Industrial Automation
- Embedded System

Engineering | VL

November 2020
January 2017

Senior software Design and Develop Engineer| Projects Lead, Arta Vision Ava Eng. Co., Iran

- Plan, coordinate and organize phases of a Development project to completion.
- Utilize schedules to organize and understand project tasks and manages the tasks throughout the system design and verification phases.
- Establish accountability and measurements, continually review progress, efficient reporting.
- Direct communication with Development Program and Customer Program Management.

** Key Projects : **

- Development of a Web-based Monitoring Software, IVMS
- Led the creation of a 3D online Visualization application.
- Development of graphical trends and graphs for comprehensive data representation.

Python | Django | Linux | Docker | ZMQ | PostgreSQL | Grafana | ReactJS

November 2020 – February 2015

Senior Hardware Design Engineer| Projects Lead, Arta Vision Ava Eng. Co., Iran

Senior Hardware Design Engineer, Project Lead working as a team member on the new Hardware Designs of AVA from concept to prototype, build, Design Verification and Qualification.

** Key Projects : **

- Spearheading the design and production of a range of environmental transducers.
- Pioneering the development and manufacturing of a lead-acid battery monitoring solution.
- Steering the design and manufacturing processes for power infrastructure solutions.
- Design and Develop an SNMP to Modbus protocol data converter.
- Showcasing proficiency in conceptualizing, planning, and implementing solutions that meet and exceed project requirements.

Electronics | PCB | C | Embedded board | IoT | ModBus | SNMP

November 2016 – February 2012

Mechatronics Designer, SYNTECH, Iran

Engaged at the @home Robot lab at SYNTECH, participating in various research and development projects. Contributed to international RoboCup and IranOpen competitions.

Key Projects :

- Designed and implemented a 7DOF Robot Arm, leading a team and development.
- Led the design and implementation of a power management system, using Altium and Keil uVision.
- Integrated a mobile robot with ROS, handling software development in C++, Linux, and ROS.
- Designed and manufactured a robot lifting system.

ROS | C | C++ | Linux | Robotics | Altium | Matlab | Microcontrollers | Linux | Manipulator | MoveIt | Kinematic | DH | Perception | Navigation

March 2017 – December 2016

Robotics Research and Development, Pardis University, Iran

FARAT, an upper body exoskeleton robot

This robot is designed for rehabilitation emphasizing EMG data collection and interpretation. The robot aids physiotherapy by allowing a physiotherapist, equipped with the MYO armband device, to perform predefined actions for whole-arm rehabilitation. The design encompasses biomechanical modelling, conceptual design, loading and stress analysis, with 3D printing for manufacturing. The final prototype includes control instruments and a mobile application for seamless operation.

Python | EMG | Myo Armband | Servo Motor | Dynamixel | Exoskeleton

Honors & Awards

- Member of the Technical Committee in @Home League, International Robotic Competition, Iran, Apr 2015.
- Participant in the International RoboCup competition in Brazil, August 2014.
- Participant in the International RoboCup competition in Eindhoven, The Netherlands, July 2013.
- 1st place in @Home League at IranOpen, International Robotic Competition, Iran, 2012, 2013, 2014, 2015, 2017.
- Participant in @Work League, International Robotic Competition, Iran, Apr 2015.

Certificates

- Build Basic Generative Adversarial Networks (GANs), September 2022.
- PyTorch Essential Training : Deep Learning, August 2022.
- Python Object-Oriented Programming, August 2022.
- Affective computing and social robots in the therapy of children with autism, 30th May to the 3rd of June 2022.
- Research integrity Summer school, 14-18 June 2021.
- Attended Data Science Course at Tosee, Open Higher Education Institute, June 2019 - April 2020.
- Internet of Things, IEEE Student Branch of Iran University of Science and Technology, 2018.
- Deep Learning for Self-Driving Cars, The 6th RSI International Conference on Robotics & Mechatronics, Oct 2018.
- Internet of Things Workshop, The First International Congress on Smart Technologies, August 2018.
- Machine Learning Online Course Certificate from STANFORD UNIVERSITY, June 2014.
- Image and Video Processing Online Course Certificate from DUKE UNIVERSITY, March 2014.
- Statistical Analysis of fMRI Data with Martin Lindquist, Johns Hopkins University, 2014.
- Technician of Network Equipment, The Technical and Vocational Organization, Oct 2011.
- Network Technician, The Technical and Vocational Organization, Oct 2011.

Publications

- Towards Memory-Driven Agentic AI for Human Activity Recognition, 2025
- Efficient Skeleton-based Human Activity Recognition in Ambient Assisted Living Scenarios with Multi-view CNN, 2024
- Robotic Vision and Multi-View Synergy : Action and Activity Recognition in Assisted Living Scenarios, 2024
- Lightweight Human Activity Recognition for Ambient Assisted Living, 2023
- RHM-HAR-SK : A multi-view dataset with skeleton data for Ambient Assisted Living Research, 2023
- RHM : Robot House Multi-view Human Activity Recognition Dataset, 2023

- Human Activity Recognition at Home : Benchmarks and Competition, 2021
- Robot House Human Activity Recognition Dataset, 2021
- Affordable Robot Mapping using Omnidirectional Vision, 2021
- Automatic ROI Detection in Lumbar Spine MRI, 2018
- MRL@ Home 2018 Team Description Paper, 2018
- FARAT1 : An Upper Body Exoskeleton Robot, 2017
- Mechanical Basic and Detailed Design for the Redundant Arm SAAM applied on a Domestic Service Robot, 2017