Mohammad Rahmani Curriculum Vitae

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Links: Website Github Linkedin X	

Summary

Multi robot systems, ROS, AI and Swarm intelligence, Data science, machine learning and computer vision, Sensor data fusion, statistical inference. Software engineering.

Skills

- **Programming & Frameworks:** C++, Python, ROS, MAVROS, Gazebo, CTU-MRS framework
- **UAV Systems & Middleware:** MAVLink, QGroundControl (QGC), PX4, ArduPilot
- **Probabilistic State Estimation:** Dynamic Bayesian Networks (DBN), Kalman Filters, Particle Filters, Bayesian filtering
- **Computer Vision & Perception:** Visual SLAM, Visual Odometry, Sensor Fusion (LiDAR, GPS, IMU, camera)
- **Machine Learning:** Autoencoders for dimensionality reduction, sequential modeling for novelty detection
- **Simulation & Testing:** UAV simulation in ROS/Gazebo, leader–follower and confined-space scenarios, unit testing (pytest, CI/CD)
- **Embedded & Real-Time Systems:** UAV autopilot integration, embedded programming for sensor fusion and navigation
- **Collaboration & Development:** Git, Agile workflows, continuous integration, documentation in LaTeX

Languages

English: IELTS 7.5, **German:** B2.1, **French:** C1, **Persian**: Native,

Education

PhD and Senior scientist candidate in Networked and Embedded Systems in **Klagenfurt University, Austria.** My research topic is “Self-awareness in multi-robot systems”. I am

developing an artificially intelligent framework using which multiple robots learn incrementally how to accomplish a task by building models from sensory data such as LIDAR and GPS sensors.

Masters': Computer Science, Amirkabir University of Technology, 2013-2015

Modules included: Machine learning, Clustering, Image processing, Data Mining, Logic programming, Computer Science Theory, Theory of Computer Systems **Average Score: 17/20**

Projects during master's:

- Modeling Time Series By Means of Fuzzy Inference Systems, Advisor Prof. Dr. Adel Mohammadpour
- Tour Recommender System By Means of a Naive Bayes Classifier Driven Model, Advisor Prof. Dr. Adel Mohammadpour
- Trajectory Recommender System By Means of Multiple Linear Regression, Advisor Prof. Dr. Mehdi Ghatee
- Tour Driver Recommender System By Means of Decision Trees and Naive Bayes Classifier, Advisor Prof. Dr. Mohammad Ebrahim Shiri Ahmad Abady
- N-Queens Puzzle in Prolog Programming Language, Advisor Prof. Dr. Mohammad Ebrahim Shiri Ahmad Abady

Bachelors': Applied Mathematics in Computer Science, Payam-e Noor University of Shiraz, 2001-2005

Modules included: Algebra, Linear Algebra, Discrete Mathematics, Graph Theory, Mathematical Analysis, Statistics and Probability, Programming Concepts, Data structures, Data storage and Retrieval, Numerical Analysis, Operations Research, Differential Equations, Stochastic Processes, Complex Functions, Time Series **Average Score: 16/20**

Final Project: Complex Matrices and their applications. Supervisor Shams-al Moluk Khoshdel

Professional Experience

Advanced AI researcher and engineer at Graz university 2025-... Austria

At Graz university I develop multiple AI models to extract, classify and generate inference and provide visual interpretations. These tasks involve a variety of expertise from computer vision to work with different sensory data.

Senior data and sensor scientist in Klagenfurt university 2020-..., Austria

I developed a framework that builds temporal models from multiple sensory data derived from multiple UAVs. In the first stage I used dynamic Bayesian Bayesian networks to build temporal models for LIDAR and GPS sensory data mounted on two UAVs. Then I used deep learning tools such as LSTMs and CNNs and GANs. I used ROS and GAZEBO for simulation.

Senior data scientist and sensor scientist at Lumetry diagnostic GMBH 2024-..., Austria

In this company I developed multiple deep and classical machine learning tools to diagnose Chronic Obstructive Pulmonary Disease (COPD) and blood CO2 estimation with different

classification and regression methods using the data derived from CO2 and flow sensors. My suggested solutions achieved 98% for classification and 92% for regression.

Senior data scientist at Mavoco IoT GMBH 2023-2024, Austria
In this company, I developed different deep learning machine learning methods for automatic configuration of IoT tools using natural language. I used deep learning models to convert what the customer inputs as natural language and then using multiple deep learning methods a set of configuration is suggested to the user. 98% of the recommended configurations matched with users' expectations.

Robotics researcher in Rovira i Virgili university, 2017-2020, Spain
I worked on an EU horizon 2020 project called GABLE. I used deep learning models for action prediction of disabled people to control multiple computer games and I developed another tools to automatically adjust the settings of the games according to the disability level of the player such as speed of objects in the games. Additionally, here I got introduced to robots such as Pepper from softbank. For this robot I developed a machine vision tool to recognise some actions such as waving and then wave back to motivate disabled people to perform physical exercises. The aforementioned tools were developed as a part of the following projects:

- **Rehabibotics: using humanoid robots to convey rehabilitation therapies to Disabled People**
- **Enhancing Robot Therapy with Emotion Awareness for Kids with Developmental Disorders in Clinical Settings**

Noon Dreams company 2006-2016, Iran

I founded this company and I developed these AI tools:

- A content management system that could intelligently recommend pages on different products using both clients navigation history and her closeness to other users.
- A project management framework which could gradually learn and suggest relevant tasks of a project. It automated the process of reserving a tour as a project that includes tasks like flight or hotel booking, employment of tour guides and drivers as well as definition of itineraries and plans for tours in which machine learning models were applied to recommend passengers appropriate tours, or to recommend trajectory to drivers which were mostly originated from the projects I developed under the guidance of my professors during my masters'.
- A system for compiling energy consumption of building units and performing and representing data analysis and visual graphs based on compiled information. The Analytics included the application and modification of data mining techniques and machine learning models to discover inconsistency in the data provided by landlords and responsible organizations.
- Simulation of road ramps traffic by using c++ programmed dlls for VISSIM software.

Datis Data Publishing (Shiraz University) 2006-2008, Iran

- Development of educational games in which the consciousness, attention and several other cognitive factors of the players were measured and stored in the database for analytical purposes. An educational software for mining into human organs using 3D images.

Publications

[1] M. Rahmani, B. Rinner, Anomaly detection in multi-robot systems exploiting self-awareness, 2023, International Conference on Frontiers of Artificial Intelligence, Ethics, and Multidisciplinary Applications, Athens, Greece

[2] M. Rahmani, B. Rinner, Towards Self-Awareness in Multi-Robot Systems, 2022, Austrian Robotics Workshop, Villach Austria

[3] *Instant Measurement of the Difficulty Level of Exergames with Simple Uni-Dimensional Level Goals for Cerebral Palsy Players.* Conference: JCSG2018 - Joint Conference on Serious Games. Darmstadt, Germany