Amirhosein Alian

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London, UK

Aug 2021 - Aug 2025

Summary

Machine learning researcher with a strong background in deep learning, experimental design, and algorithm development applied to robotics and biomedical systems. Proficient in Python, C++, TensorFlow, and scientific computing libraries (NumPy, SciPy, Pandas). Experienced in designing, training, and evaluating neural networks (FFN, LSTM, GRU), implementing data pipelines, and collaborating in interdisciplinary research teams. Passionate about applying ML to real-world scientific problems, including healthcare, robotics, and computational biology.

Education

Imperial College London PhD in Clinical Medicine Research	Aug 2021 – Aug 2025
 Thesis: Development of a Proprioceptive Sensing for Soft Continuum Robots Supervisors: Dr. George Mylonas, Dr. James Avery 	
 Amirkabir University of Technology MSc in Mechatronics Engineering Thesis: Control and Implementation of Fluid-driven Robotic Arm GPA: 17.13/20 (3.53/4.0) 	Sep 2017 – Sep 2020
 Isfahan University of Technology BSc in Mechanical Engineering Thesis: Control and Implementation of Fluid-driven Robotic Arm GPA: 16/20 (3.2/4.0) 	Sep 2013 – Sep 2017
• GPA: 16/20 (3.2/4.0)	

Skills

Programming: Python, C++, MATLAB, TensorFlow, Scikit-learn, NumPy, SciPy, Pandas, SQL

Machine Learning: Deep Learning, Neural Networks (FFN, LSTM, GRU), Domain Adaptation, Transfer Learning, Statistical Modeling, Experiment Design

Engineering: Experimental Design, Statistical Analysis, Prototyping, CAD, Arduino, PCB Design

Robotics, Biomedical: Control Systems, Sensor Fusion, Surgical and Soft Robotics, Biomedical Signal Processing

Languages: English (Fluent), Persian (Native)

Experience

Postgraduate Researcher

Imperial College London

- Designed and fabricated a flexible sensor system for real-time shape estimation in robot-assisted surgery.
- Developed machine learning models (FFN, LSTM, GRU) to interpret time-series data from soft sensors.
- Applied domain adaptation and transfer learning techniques to enable generalization across variable surgical conditions.
- Built and validated a data acquisition and preprocessing pipeline, including denoising, normalization, and feature extraction.
- Conducted, analysed, and visualised results from multiple experimental trials simulating clinical environments.
- Engineered a robotic system to classify tissue stiffness using sensor fusion and machine learning.

- Automated the end-to-end data processing pipeline for model training and evaluation.
- Deployed recurrent neural networks for accurate classification based on tactile feedback.
- Designed experiments to collect labeled data and statistically evaluate model performance.

Robotics R&D Engineer (Visiting)

Multi-scale Medical Robotics Centre

- Executed *ex vivo* and *in vivo* trials to validate a soft robotic endoscope in clinical settings.
- $\circ~$ Developed real-time hardware-software interfaces for synchronized sensor and imaging data acquisition.
- $\circ\,$ Assembled multi-modal datasets (C-arm, MRI, sensor data) to support algorithm development and model training.
- Collaborated with clinical teams to ensure translational impact and regulatory compliance.

Research Assistant

Amirkabir University of Technology

- Developed adaptive-sliding mode controllers for nonlinear dynamic systems.
- Simulated control strategies in MATLAB/Simulink to assess performance under external disturbances.
- Designed a co-operative manipulation system using soft grippers and real-time vision feedback.
- Integrated serial communication between MATLAB and Arduino for control loop validation.

Certificates and Awards

Certificates

- Deep Learning Specialization **G**
- Machine Learning Specialization C

Awards

- $\circ~$ Awarded full scholarship for PhD studies at Imperial College London
- Awarded runner-up for best podium presentation at the 14th Hamlyn symposium on Medical Robotics
- Received national undergraduate and graduate full scholarship

Publications

Tissue Palpation in Endoscopy Using EIT and Soft Actuators, Frontiers in Robotics and AI	Apr 2024
Alian, Amirhosein, Avery, J., Mylonas, G.	
Current Engineering Developments for Robotic Systems in Flexible En- doscopy, Techniques and Innovations in Gastrointestinal Endoscopy	Oct 2023
Alian, Amirhosein, et al.	
Soft Continuum Actuator Tip Position and Contact Force Prediction Us- ing EIT and RNNs, IEEE International Conference on Soft Robotics - RoboSoft	Apr 2023
Alian, Amirhosein, Mylonas, G., Avery, J.	
Curvature Tracking of a Two-Segmented Soft Finger Using an Adaptive Sliding-Mode Controller, IEEE/ASME Transactions on Mechatronics	Dec 2022
Alian, Amirhosein, Zareinejad, M., Talebi, H. A.	

Hong Kong Feb 2024 – July 2024

Tehran, Iran Sep 2017 – Sep 2020