Amirhosein Alian

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Summary

Hands-on systems engineer with a background in mechatronics, embedded control, and test rig development. Experienced in building and supporting automated lab testbeds integrating sensors, actuators, and real-time data pipelines. Skilled in mechanical-electrical design, calibration routines, sensor fusion, and iterative system upgrades. Passionate about scaling lab insights to functional systems, with strong communication and cross-disciplinary collaboration skills. Proficient in Python, MATLAB, C++, and ML-based system diagnostics.

Education

Imperial College London *Aug 2021 – Aug 2025*
PhD in Surgical Robotics

- Thesis: *Development of a Proprioceptive Sensing for Soft Continuum Robots*
- Supervisors: Dr. George Mylonas, Dr. James Avery

Amirkabir University of Technology *Sep 2017 – Sep 2020*
MSc in Mechatronics Engineering

- Thesis: *Control and Implementation of Fluid-driven Robotic Arm*
- GPA: 17.13/20 (3.53/4.0)

Isfahan University of Technology *Sep 2013 – Sep 2017*
BSc in Mechanical Engineering

- Thesis: *Control and Implementation of Fluid-driven Robotic Arm*
- GPA: 16/20 (3.2/4.0)

Skills

System Integration: Test Rig Development, Mechatronics, Sensor Calibration, Data Acquisition, Embedded Control

Design & Prototyping: SolidWorks, 3D Printing, PCB Design

Software & Data Tools: Python, C/C++, MATLAB, Simulink, Git, Signal Processing

Testing & Validation: Experimental Setup, Sensor Fusion, Test Automation, Lab Troubleshooting

Soft Skills: Adaptability, Comfort with Ambiguity, Technical Curiosity, Resilience Under Pressure

Experience

Postgraduate Researcher *London, UK*
Imperial College London *Aug 2021 – Aug 2025*

- Built and maintained benchtop test rigs to validate sensor-actuator systems for robotic surgical tools under varying loads and geometries
- Designed flexible sensor arrays and embedded them into mechanical assemblies; handled calibration, drift correction, and repeatability analysis
- Developed ML-based data analysis tools for classifying mechanical properties (e.g., tissue stiffness) from multi-modal sensor data
- Managed end-to-end test cycles: prototyping fixtures, running test protocols, logging data, and evaluating system performance
- Wrote engineering documentation for rig architecture, testing standards, and system upgrades; collaborated with clinical and technical teams

Robotics R&D Engineer (Visiting) *Hong Kong*
Multi-scale Medical Robotics Centre *Feb 2024 – July 2024*

- Supported setup and troubleshooting of robotic testbeds used in *in vivo* trials, including synchronization of sensors and imaging systems
- Developed PC-side tools and embedded firmware for test automation, remote sensor configuration, and real-time data monitoring
- Managed calibration of embedded sensor hardware and oversaw testing repeatability under clinical simulation conditions
- Collaborated with lab/facility teams to coordinate hardware integration and resolve system-level constraints during trials

Research Assistant *Tehran, Iran*
Amirkabir University of Technology *Sep 2017 – Sep 2020*

- Developed and simulated control systems for nonlinear fluid-driven robotic platforms using MATLAB/Simulink
- Designed mechanical components for dual-arm soft robotic test rigs and conducted iterative validation with real-time feedback
- Built and operated test environments with image-based feedback and embedded sensor-actuator loops
- Assisted in system scaling from early lab prototypes to functional multi-arm manipulation systems with cooperative controls

Certificates and Awards

Certificates

- Deep Learning Specialization
- Machine Learning Specialization

Awards

- 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 Endoscopy, Techniques and Innovations in Gastrointestinal Endoscopy *Oct 2023*

Alian, Amirhosein, et al.

Soft Continuum Actuator Tip Position and Contact Force Prediction Using 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.