Yasamin Azmi

azmiyasamin@gmail.com | LinkedIn

Education

2024 – Present M.Sc. in **Mechanical Engineering**
Sharif University of Technology, Tehran, Iran
Thesis: Biomechanical Analysis of the Spine in Smart Balance Board Exercises
GPA: 18.73/20 **Supervisors:** Prof. Saeed Behzadipour and Prof. Navid Arjmand

2020 – 2024 B.Sc. in **Mechanical Engineering**
Ferdowsi University of Mashhad, Mashhad, Iran
GPA: 19.01/20

Research Interests

Human Movement & Biomechanics	Computer Vision & Markerless Motion Analysis	Musculoskeletal Modelling	Machine Learning	Multimodal Sensing	Rehabilitation Engineering

Publications

1- M. N. Jeirani, **Y. Azmi**, M. Shojaeefard, M. Yousefi, and F. Farahmand, "Assessing Gait Complexity and Adaptability in Children with Cerebral Palsy," *2025 32nd National and 10th International Iranian Conference on Biomedical Engineering (ICBME)*, Tabriz, Iran, 2025, pp. 269-274, doi: 10.1109/ICBME68496.2025.11392571

2- **Y. Azmi**, M. Noorollahi, M. Farshidianfar, P. Oliazadeh, and S. G. M. Mashhadi, "Laser Edge Welding Path Detection Using Image Processing Algorithms," *2024 32nd Annual International Conference of the Iranian Society of Mechanical Engineers*, Arak, Iran, 2024, https://civilica.com/doc/2020201

3- M. Noorollahi, **Y. Azmi**, M. Farshidianfar, S. G. M. Mashhadi, and P. Oliazadeh, "Extraction of Geometric Profile of Rubber Gaskets Using Linear Laser Triangulation System," *2024 20th National Conference and 9th International Conference on Manufacturing and Production Engineering of Iran*, Tehran, Iran, 2024, https://civilica.com/doc/2014935

Selected Skills

Programming & Scientific Computing: Python, MATLAB, scientific data processing

Human Movement & Biomechanics: Experimental human-movement data collection (Vicon motion capture, force plates, surface EMG), multimodal data synchronization and analysis, musculoskeletal modelling, EMG-based model validation

Computer Vision & Optical Sensing: Image preprocessing, segmentation, feature extraction, CNN-based visual detection, laser triangulation, industrial camera-based sensing

Machine Learning: Predictive modelling, regression, model training and evaluation, generalization assessment

Engineering & Modelling Tools: SolidWorks (CAD), AnyBody, OpenSim, Nexus, Mimics

English: Professional working proficiency

Selected Courses

- Applied Machine Learning (Graduate) 19.5/20 (2nd score)
- Medical Robotics (Graduate) 18.8/20
- Occupational Biomechanics (Graduate) 18.5/20
- Musculoskeletal Biomechanics (Graduate) 19.4/20 (1st score)
- Advanced Automatic Control (Undergraduate) 19.1/20 (1st score)
- Automatic Control (Undergraduate) 19.58/20

Notable Projects

Jan 2025 – Present Biomechanical Analysis of the Spine in Smart Balance Board Exercises **(M.Sc. Thesis)**

- Conducted an experimental study with 20 healthy participants using synchronized Vicon motion capture, force plates, surface EMG, and balance-board signals.
- Adapted a full-body AnyBody model (~42 DOF, ~300 muscle fascicles) to estimate trunk muscle forces and lumbar spinal loading.
- Comparing model-predicted lumbar muscle activation with measured EMG (analysis in progress).

Aug 2025 – Jan 2026 Predicting Three-Dimensional Human Body Posture During Load-Handling Activities Using Kolmogorov-Arnold Networks **(Research Project)**

- Developed and evaluated Python-based Kolmogorov–Arnold Network (KAN) models for predicting 3D human posture from biomechanical data, using quantitative performance and geometric-consistency metrics for validation.
- Performed data preprocessing, model training and quantitative validation to assess prediction accuracy and generalization.

Aug 2024 – Jan 2025 Assessing Gait Complexity and Adaptability in Children with Cerebral Palsy

- Analyzed gait kinematics in children with cerebral palsy using kinematic synergy analysis to investigate movement complexity and adaptability (Paper 1).

Feb 2023 – Aug 2024 Laser Edge Welding Path Detection Using Image Processing Algorithms

- Developed image-processing pipelines for laser-edge weld-path detection from real camera images, including image preprocessing, segmentation and feature extraction (Paper 2).
- Carried out a follow-up feasibility study covering the optical design and a CNN-based (U-Net/ResNet34) segmentation model.

Jul 2023 – Oct 2023 Extraction of Geometric Profile of Rubber Gaskets Using Linear Laser Triangulation System

- Developed and experimentally validated a linear laser-triangulation vision system integrating an industrial camera, laser-line sensing, optical filtering, and MATLAB-based image processing for high-precision geometric measurement (Paper 3).

Teaching Experience

Nov 2022 – Sep 2023	Mechanical Dynamics (Undergraduate)	Prof. Abdolmajid Yousefsani
Sep 2023 – Jan 2024	Mechanical Vibration (Undergraduate)	Prof. Hamid Moenfard
Sep 2025 – Feb 2026	Musculoskeletal Biomechanics (Graduate)	Prof. Farzam Farahmand

Industrial Experience

2023 – 2024 **Engineering Intern,** TGT Co. (Taha Ghaleb Toos), Laser & Vision R&D Group

- Worked on real-world laser-vision systems for industrial sensing, tracking, and geometric measurement, combining optical sensing with computer-vision algorithms.
- Built image-processing workflows for path detection and corrugation geometry extraction.
- Contributed to two conference publications based on applied visual sensing projects.

Leadership & Activities

2025 - 2026 **Executive Secretary,** "Harkat" Scientific Association, Sharif University

- Organized technical events, workshops, and collaborations in biomechanics.

Honors and Awards

2022 – 2024 Ranked 1st out of 120 students in the Mechanical Engineering undergraduate cohort at Ferdowsi University of Mashhad.

2024 Granted admission to the M.Sc. program without the national entrance exam as a top 1% student.

References

Available upon request.