FARHAD HOSEYNI

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EDUCATION

- **Master's Degree: Robotics: Algorithms & Software AI** Sept. 2025
  UT. *University of Twente* *Enschede-Netherlands*

- **Bachelor's Degree: Electrical and Control Engineering** Sept. 2019 – Sept. 2024
  K. N. Toosi University of Technology *Tehran-IRAN*
  - GPA: 18.33/20
    Ranked 3rd in the Entrance

- **Minor's Degree: Computer Engineering** Sept. 2019 – Sept. 2024
  K. N. Toosi University of Technology *Tehran-IRAN*

RESEARCH INTERESTS

- Artificial Intelligence
- Computer Vision
- Robotics
- Control Theory
- Embedded Systems
- Biomedical Engineering

EXPERIENCES

- UT. **Fraunhofer Innovation Platform for Advanced Manufacturing** Oct. 2025 – Present
  Robotic & Computer Vision Engineer
  - Developed and deployed robotic manipulation pipelines using Yaskawa GP-7 and Universal Robots arms for battery cell assembly/disassembly processes, integrating computer vision for precise pose estimation and alignment.
  - Designing and implementing vision-based monitoring systems to assess battery physical and chemical health, enabling real-time quality control and process optimization on an advanced manufacturing shopfloor.
- **SmarTeeth Startup** | **Smartory Startup** Mar. 2023 – Sep. 2025
  AI & Computer Vision Engineer
  - Curated and annotated a comprehensive multi-source dental radiography dataset in collaboration with multiple dentists, ensuring clinical relevance and annotation consistency.
  - Coordinated cross-functional teams comprising AI engineers, medical professionals, DevOps, and marketing to align product development with clinical and business requirements.
  - Designed and implemented an AI-powered dental assistant for classification, detection, and segmentation of diverse radiographic images, enabling precise localization of anatomical structures and pathologies.
  - Mentored and trained junior interns within the computer vision engineering team, supporting their development in deep learning and software engineering best practices.
  - Proposed and published a novel data-augmentation framework tailored to dental imaging, improving

model robustness and generalization across heterogeneous scanners and acquisition protocols.
- Developed multi-stage deep learning pipelines with custom pre- and post-processing modules to enhance accuracy, reliability, and inference speed on clinical workloads.
- Integrated a large language model to automatically generate structured diagnostic reports from model outputs, streamlining clinical documentation and decision support.
- Delivered a web-based AI-assistant application deployed in clinical workflows, accompanied by two peer-reviewed scientific publications.

- **APAC AI & Control** | **Rasul Akram Hospital** Jun. 2022 – Sep. 2025
  Technical Manager & Computer Vision Engineer
  - Led the development of an AI-driven software system for classification, detection, segmentation, and volumetric quantification of intracranial hemorrhages in CT scans, targeting rapid triage and quantification in emergency settings.
  - Managed a multi-disciplinary team of engineers and radiologists, coordinated data acquisition, and established standardized annotation protocols to ensure reproducibility and clinical validity.
  - Supervised medical annotators to maintain high-quality labeling, including inter-rater agreement assessment and iterative refinement of annotation guidelines.
  - Performed statistical analysis of dataset characteristics to characterize population-specific patterns and biases, informing model training and evaluation strategies.
  - Developed explainable AI components to approximate specialist decision-making and provide interpretable visualizations for clinical validation and trust.
  - Delivered minimum-viable-product models, a web-based annotation platform, multiple academic papers, and presentations at national and international medical congresses.

- **Mechatronics and Biomechatronics Lab** Apr. 2022 – Oct. 2022

  - Completed an internship in the Mechatronics and Biomechatronics Laboratory at K.N. Toosi University of Technology.
  - Collected EOG signals using a wearable headband and implemented signal pre-processing pipelines to estimate cognitive load across different visual tasks, supporting human-factors and neuroergonomics analysis.

More information on My Personal Website (click here).

SKILLS

Programming/Scripting

- Python
  - PyTorch/CUDA
  - Tensorflow
  - Sklearn
  - OpenCV
  - Pandas
  - NumPy
- C/C++
- MATLAB/Simulink
- ROS/Drake
- SQL
- LaTeX
- Linux

Domain Knowledge

- AI & Computer Vision
- Robotic Arms
- SLAM
- Deep Learning
- Machine Learning
- Natural Language Processing (NLP)
- Instrumentation
- Control Engineering

More information on My LinkedIn Page (click here).

SELECTED PUBLICATIONS

"Hemorica: A Comprehensive CT Scan Dataset For Automated Brain Hemorrhage Classification, Segmentation, And Detection" 2025 arXiv
"Benchmarking Class Activation Map Methods for Explainable Brain Hemorrhage Classification on Hemorica Dataset" 2025 Under Review - arXiv
"AugmenTory: A Fast and Flexible Polygon Augmentation Library", 2024 arXiv
"Advanced Deep Learning-Based Approach for Tooth Detection, and Dental Cavity and Restoration Segmentation in X-Ray Images" , 2023 11th RSI International Conference on Robotics and Mechatronics (ICRoM)

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SELECTED PROJECTS

- **UT.** Simulated and controlled KUKA LBR iiwa and Yaskawa GP-7 arms in Drake for environment manipulation.University of Twente
- **UT.** Built and simulated an end-to-end generative-AI-driven robot arm for environmental manipulation and analyzed performance improvements via flow matching models.University of Twente
- **UT.** Studied the effect of NLP prompt ambiguity on SmolVLA-driven manipulation tasks using a LeRobot SO-101 arm. University of Twente
- Annual competition of artificial intelligence for classification of the abnormal brain in MRI radiography IAAA Organization
- programming Kolmogorov-Arnold Networks (KAN) and perform a comprehensive grid search on Mnist, Cifar10 and Physionet-ICH datasets K. N. Toosi University of Technology
- Fault Detection in an Industrial Valve Using the DAMADICS Dataset and Machine Learning-Based Methods K. N. Toosi University of Technology
- Fault Detection in Industrial Motor Bearings Using the CWRU Bearing Dataset and Machine Learning Methods K. N. Toosi University of Technology

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