Seyed Mahdi Fazeli

AI Researcher

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Google Scholar Location: Edmonton, AB, Canada

Work Experience

Research Assistant 2023 – 2024
Telerobotic and Biorobotic Systems Group University of Alberta

- Developed motion planning algorithms for robotic systems and Designed solutions for robot-assisted surgery.

Control Engineer, Control and Instrumentation Department 2021 – 2022
Nadin Andishe Bargh Oxin Iran

- Developed and optimized control systems and instrumentation equipment.

Projects and Research

Image Captioning

- Developed an end-to-end image captioning model using a CNN-LSTM architecture.
- Employed VGG19 for feature extraction and LSTM for sequential text generation, trained on the COCO dataset.

Text Summarization

- Built both extractive and abstractive text summarization models using Transformer-based architectures (BART/T5).
- Designed an API-based service for real-time document summarization, improving accessibility and efficiency.

Product Recommendation System

- Designed a session-based recommender system leveraging collaborative and content-based filtering.
- Addressed the cold-start problem by integrating real-time user interaction data.

Resume Analyzer

- Created an NLP-powered tool for resume screening and candidate ranking.
- Utilized Named Entity Recognition (NER) and Transformer-based models to extract key information from resumes.

RAG for Excel and PDF Data

- Built Retrieval-Augmented Generation (RAG) pipelines to query structured (Excel) and unstructured (PDF) data.
- Used LangChain and OpenAI's LLMs to enhance document comprehension and response accuracy.

Plate Detection and Recognition

- Implemented a real-time license plate detection system using deep-learning object detection networks.
- Developed a low-resolution face recognition model with super-resolution networks to enhance image quality.

Skills

Software Development: Python, Git, Jira, Linux, MATLAB, C++

Frameworks and Libraries: Pytorch, Keras, OpenCV

EDUCATION

PhD candidate Student| ***Electrical and computer Engineering*** — Aug. 2023 – May 2026
University of Alberta — Canada, Edmonton

Master of Science | ***Electrical and computer Engineering*** — Aug. 2017 – Jun 2019
Shahid Behshti University — Iran, Tehran

Bachelor of Science | ***Electrical and computer Engineering*** — Aug. 2013 – Sep 2017
Jundi Shapur University of Technology — Iran, Dezful

ONLINE EDUCATION

Advanced Computer Vision with TensorFlow — 2021
Instructor: Laurence Moroney

Neural Networks and Deep Learning — 2020
Instructor: Andrew Ng

Improving Deep Neural Networks: Hyperparameter Tuning, Regularization, and Optimization — 2020
Instructor: Andrew Ng

Structuring Machine Learning Projects — 2020
Instructor: Andrew Ng

Convolutional Neural Networks — 2020
Instructor: Andrew Ng

ECE740 - Deep Learning in Computer Vision — 2023
Instructor: Xingyu Li

Sequence Models — 2020
Instructor: Andrew Ng

Fundamentals of Reinforcement Learning — 2024
Instructor: Adam White and Martha White

Sample-based Learning Methods — 2024
Instructor: Adam White and Martha White

Prediction and Control with Function Approximation — 2024
Instructor: Adam White and Martha White

PUBLICATIONS

An Integrated Fault Estimation and Fault-Tolerant Control Method Using H∞-Based Adaptive Observers — 2020
S. Mahdi Fazeli, Mostafa Abedi

International Journal of Adaptive Control and Signal Processing, DOI: 10.1002/acs.3144

Active Fault-Tolerant Control of Cable-Driven Parallel Robots — 2023
S. Mahdi Fazeli, Mostafa Abedi, Amir Molaei, Masoud Hassani, Mohammad A. Khosravi, Adel Ameri

Nonlinear Dynamics, DOI: 10.1007/s11071-022-08184-x

Dynamic Model-Free Control Approach for Fully Constrained Cable-Driven Parallel Robots — 2023
Seyed Mahdi Fazeli, Adel Ameri, Amir Molaei, Mohammad A. Khosravi, Masoud Hassani

IEEE Transactions on Industrial Electronics,DOI: 10.1109/TIE.2023.10356764

Noniterative Positive Constrained Control of Cable-Driven Parallel Robots — 2023
Adel Ameri, Seyed Mahdi Fazeli, Amir Molaei, Mohammad A. Khosravi, Masoud Hassani

IEEE Transactions on Industrial Informatics, DOI: 10.1109/TII.2023.10148828

A Real-Time Approach to Risk-Free Control of Highly Redundant Cable-Driven Parallel Robots — 2024
Adel Ameri, Amir Molaei, Mohammad A. Khosravi, Amir G. Aghdam, Javad Dargahi, S. Mahdi Fazeli

IEEE Transactions on Systems, Man, and Cybernetics: Systems,DOI: 10.1109/TSMC.2024.10403998

Two Modified DFT-Based Algorithms for Fundamental Phasor Estimation — 2022
Saeed Afrandideh, Mohammad Reza Arabshahi, Seyed Mahdi Fazeli

IET Generation, Transmission & Distribution, DOI: 10.1049/gtd2.12516

Honors and Awards

University of Alberta Graduate Recruitment Scholarship 2023
Awarded for academic excellence and potential as a graduate student.

Shahid Fakhraei Award 2023
Ranked 1st among three sub-fields (Control Engineering, Power Engineering,
and Electronic Engineering) during B.Sc studies at Jundi Shapur University of Technology.

Teaching Activity

ECE 464: Medical Robotics and Computer-Integrated Intervention: TA | Instructor: Dr.Tavakoli 2024

Electronic Laboratory: Lecturer | Payame Noor University 2021

Robust Control: Teacher Assistant | Instructor: Dr. Ali Akbar Afzalian 2018