Abbas Nosrat

AI RESEARCHER

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About

I am a passionate AI researcher/instructor with expertise in deep learning and machine learning with a strong mathematical foundation due to my control engineering background and extensive hands-on experience in projects related to Computer Vision, NLP, DSP, and Computer Audition. I strive to solve complex problems. My academic journey includes a Master's degree from the University of Tehran, where I focused on meta-system identification, and practical experience in industries ranging from pharmaceuticals to entertainment tech innovations. I am dedicated to continuous learning and research, aiming to contribute to the cutting edge of artificial intelligence and its applications. I have also gained valuable experience in AI project management and the business aspects of an AI project due to working with the military and Ronak Pharmaceutical Corp.

Personal Information

Age, 29
Marital Status, Single
Military Service Status, Served

Professional Experience

Oct 2025-Present	**AI Engineer**, Sepehr Ban Hooshyar
Sep 2024-Oct 2025	**AI Researcher**, A research center for the Iranian military
Dec 2024-Mar 2025	**Instructor (Part-Time)**, Tehran Institute of Technology
Sep 2023-Sep 2024	**Data Scientist**, Ronak Pharmaceutical Co
Nov 2023-Present	**Reviewer**, International Journal of Industrial Electronics Control and Optimization
Sep 2021-Sep 2023	**Research Assistant**, Machine Learning and Computational Modeling Lab
Sep 2021-Sep 2023	**Graduate Teaching Assistant**, Electrical and Computer Engineering Department, University of Tehran

Education

University of Tehran   *Tehran - Iran*
MSc CONTROL ENGINEERING   *2020 - 2023*
- Supervisors: Dr. Ahmad Kalhor, Dr. Babak N Araabi
- Advisor: Dr. Mohammad Reza Nayeri
- Thesis: Meta System Identification
- GPA: 17.06/20

Imam Khomeini International University *Qazvin-iran*

BS Electrical Engineering *2015 - 2020*

- Advisor: Dr. Hasan Zarabadipour
- GPA: 13.15/20

Projects

University of Tehran *Completed*

TFNet

This is my main master's project in which I developed a method for parametric and structural identification of industrial systems from a non-persistent excitation and a handful of I/O data.
  - **Skills:** System Identification, Control Theory, Machine Learning, Signal Processing, Time-Series Modeling

Ongoing

TFNet 2

This project is an improvement on TFNet. In this project, I am utilizing multi-task learning methods to combine the classifier and the parameter estimator to improve TFNet's accuracy and scalability.
  - **Skills:** System Identification, Control Theory, Machine Learning, Signal Processing, Multi-Task Learning

Coursework projects
- Implementation of UNet
    – **Skills**: Object Segmentation, Computer Vision
- Implementation of CycleGan and VQVAE
    – **Skills**: Computer Vision, Generative Modeling, GAN, VAE
- Implementation of rotation prediction method
    – **Skills**: Self-Supervised Learning, Representation Learning
- Adversarial attacks and explainability
    – **Skills**: Fast Gradient Adversarial Attacks, Model Explainability, LLMs, SHAP, LIME
- Few-shot classification and person reidentification using contrastive learning
    – **Skills**: Metric Learning, Contrastive Learning, Siames Networks, Few-Shot Learning

Ronak Pharmaceutical Co *Completed*

NLP-Based Performance Evaluation of Medical Sales Representatives

In this project, I used NLP techniques to find the most similar sales invoice to each visit record and if that invoice was created within 40 days after the visit, that visit is considered successful.
  - **Skills:** NLP, LLMs, Unsupervised Learning, Entity Matching

Completed

Market Size Prediction

In this Project, I used FBProphet, XGBoost, and Bayesian optimization to predict the market size for each product for the following year. This will lead you to the Streamlit app
  - **Skills:** Time-Series Prediction, FBProphet, XGBoost, Auto-Regressive Models

Military *Completed*

Zero-Shot Voice Conversion Using Non-Parallel Audio

I developed a framework for Persian VC for the Iranian military as a replacement project for my military service. The framework utilized a flow-matching conditioned with Cam++ speaker embeddings and OpenAI's Whisper for content embeddings to clone the voice of a speaker from a small speech utterance without prior training on the target speaker. The model was trained on CommonVoice dataset and deployed using TorchServe and Docker.
  - **Skills:** Signal Processing, Computer Audition, Voice Conversion, Speech Synthesis, Diffusion-Based Generative Models, In-Context Learning, Flow-Matching

Sepehrban Hooshyar *Completed*

ELINT PULSE DETECTION

I developed a model for detecting ELINT pulses for accurate EDW estimation and emmiter identification using a TCN-Transformer hybrid architecture combined with a hybrid focal loss + contrastive learning training framework.
- **Skills:** Multi-task learning, Signal Processing, Transformers, Time series classification

Hobby Projects *Ongoing*

RL

I wanted to get into RL and what better way to do some algorithms from scratch? So I got to work and implemented a few of the most popular algorithms from scratch after watching Dave Silver's RL course. This project contains the implementations for Dynamic Programming, Monte Carlo/TD algorithms, DQN, Policy Gradient, Actor Critic, DDPG, and SAC.
- **Skills:** Reinforcement Learning

Completed

SQLMCPSERVER + AGENT

In this project I developed an AI agent that can manipulate a database of retail cars using SQL. The agent can add new ads or show the existing cars according to the user preference.
- **Skills:** Agentic AI, NLP, LangChain, LangGraph, MCP Server, SQL

Completed

RESEARCH IDENTIFICATION

Reading research papers has always been a major hassle for me—especially when trying to identify the latest research themes of a particular author. I wanted to try LangGraph for the first time, but since I can't access the OpenAI stack from Iran, I decided to build my own agent using a local Qwen3 model. I developed a scraping tool to collect the latest research papers from an author's Google Scholar profile and used the model to identify the main themes of each paper.
- **Skills:** Agentic AI, NLP, LangChain, LangGraph, LlamaCPP, Local LLMs, Web Scraping

Completed

FLOW MATCHING FOR GENERATIVE MODELING

Since my Voice Conversion project required this paper and there was no intuitive tutorial for this paper, I decided to share my simple implementation on GitHub.
- **Skills:** Diffusion-Based Generative Models, Conditioned Generation, Flow-Matching, DIT

Completed

COMPARISON OF MTL LOSS-BALANCING STRATEGIES

While working on TFNet 2, I had to compare different loss-balancing strategies in MTL. Here is my implementation of Three methods in this field.
- **Skills:** Multi-Task Learning

Ongoing

GNNS FROM SCRATCH

I was trying to get into GNNs and thought of no better way than to implement a few architectures from scratch. In this repo, I have implemented Graph Convolution, GAT, and GraphSage and trained them on CORA dataset. I will add new implementations further down the line.
- **Skills:** Graph Neural Networks

Publications

TFNet: Few-Shot Identification of LTI Systems Based on Convolutional Neural Networks

- Journal of Process Control
- Authors: **Abbas Nosrat**, Ahmad Kalhor, Mohammad Reza Nayeri, Babak N Araabi
- Impact Factor: 3.3
- Cite Score: 7

Languages

Persian, Native Tongue
English, IELTS 8 (Listening 9, Reading 8.5, Speaking 7.5, Writing 6.5)

Honors and Awards

2020   **24th rank**, Iran's National University Entrance for Control Engineering Masters Degree
2024   **Member**, Iranian National Elite Foundation

Technical Background

PROGRAMMING LANGUAGES

Python, Matlab, Bash, Julia, R,

MACHINE LEARNING FRAMEWORKS

Scikit-learn, Pytorch, Tensorflow,LangChain, LangGraph, Flux.jl,

DEVELOPMENT TOOLS

Linux (Debian-Based, RedHat-Based and Arch-Based Systems), Git, SQL, Figma, Jira,

MODEL DEPLOYMENT TOOLS

Streamlit, FastAPI, Docker, TorchServe,

WRITING TOOLS

LaTeX, Lyx,

Teaching Experience

Tehran Institute of Technology

INSTRUCTOR

- Data Analysis
- Machine Learning
- Deep Learning

University of Tehran

GRADUATE TEACHING ASSISTANT

- Trustworthy AI
    - **Instructor:** Mohammad Amin Sadeghi, Mostafa Tavasoli Poor
- Analysis and Design of Neural Networks
    - **Instructor:** Ahmad Kalhor, Babak N Araabi
- Linear Control Systems Lab
    - **Instructor:** Fariba Bahrami, Abolfazl Yaghmaei
- System Identification
    - **Instructor:** Babak N Araabi
- Machine Learning
    - **Instructor:** Babak N Araabi, Mostafa Tavasoli Poor, Mohammad Reza Abolghasemi

Coursework

UNIVERSITY OF TEHRAN

- Machine Learning
- Neural Networks and Deep Learning
    - **Skills:** Computer Vision, Object Detection, Object Segmentation, NLP, VAE, GAN
- Advanced Deep Learning
    - **Skills:** Computer Vision, Self-Supervised Representation Learning, Explainability, Meta-Learning, Adversarial Attacks, VQAE, Transformers
- Analysis and Design of Neural Networks
    - **Skills:** Contrastive Learning
- Statistical Inference
    - **Skills:** A/B testing, Statistical Tests, Probability Distributions
- System Identification
    - **Skills:** Time-Series Modeling
- Optimal Control
- Non-Linear Control Systems

IMAM KHOMEINI INTERNATIONAL UNIVERSITY

- Linear Algebra
- Linear Control Systems
- Digital Signal Processing
- Signals and Systems

Personal Interests

- Guitar Playing (Blues, Funk and Jazz).

- Reading about AI, computer hardware, and Linux topics.

- Motorcycles

- Anime

- Chess