Mehrdad Nourbakhsh

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Summary

- Earned a Master's and Bachelor's in Computer Engineering, developing a strong foundation in AI, machine learning (ML), and software development over eight years of academic training.
- 3+ years of industry experience in software development and data science, working on AI-driven solutions, backend systems, and web applications across multiple organizations.
- Proven research and development skills, driven by a passion for learning new concepts and solving complex, practical problems.

Technical and Personal Skills

- Programming: Python, JavaScript/TypeScript, R, Java, C++
- Machine Learning Libraries: Tensorflow, PyTorch, PyOD, PyGOD, Scikit-learn, Pandas, Matplotlib, Flower
- Frameworks: Django, React, Next.js, Vue, Tailwind CSS, HTML/CSS, SASS, Flask, FastAPI, Electron, Spring
- Tools & Platforms: Git, Docker, OpenAI API, PostgreSQL, MongoDB, GraphQL, Simulink, OpenCV
- Language: Persian (Native), English (TOEFL ibt: *107/120*), French (Elementary)

Education

- **University of Tehran** — Tehran, Iran
  M.Sc. in Software Engineering; GPA: 4.00/4.00 — *2021 – 2024*
- **University of Tehran** — Tehran, Iran
  B.Sc. in Computer Engineering; GPA (last two years): 2.92/4.00; — *2015 – 2020*

Relevant Experience

- **University of Alberta** — Edmonton, Canada (Remote)
  Graduate Researcher — *Mar. 2025 - Sep. 2025*
  - Prototyped a **Graph Neural Network (GNN) fraud detection** method for **transaction graphs**, benchmarked it on financial datasets (such as T-Finance, IBM AML,...), compared baselines, and documented gaps in current methodologies.
- **B.A Foods** — Tehran, Iran
  Data Scientist — *Jan. 2025 - Mar. 2025*
  - **Analyzed data relationships** to detect periodic and seasonal patterns using visualizations and statistical metrics, including the Autocorrelation Function (ACF) and Partial Autocorrelation Function (PACF).
  - Developed an **AI-driven** time series forecasting solution to **predict company revenue**, leveraging models like ARIMA and SARIMA for accurate financial projections.
- **University of Tehran** — Tehran, Iran
  Software Developer — *Sep. 2023 - Sep. 2024*
  - Built a **desktop application** using **Node.js**, **Vue**,**Tailwind CSS**, and **Electron** for managing graduate student records, automating form generation, and generating reports to enhance the workflow of the ECE graduate department.
- **University of Tehran** — Tehran, Iran
  Graduate Researcher — *Sep. 2022 - Sep. 2024*
  - Designed a **GNN-based anomaly detection** approach to mitigate the impact of **backdoor attacks** in **Federated Learning (FL)**. Developed the proposed method using **TensorFlow** for training utilities, **PyTorch Geometric** for graph construction, and **PyGOD** for outlier detection.
- **University of Tehran** — Tehran, Iran
  Teaching Assistant — *Apr. 2021 - Sep. 2024*

- Deep Neural Networks: Designed and implemented a coding assignment using **TensorFlow** and **Pandas** to teach **class imbalance**, **data augmentation**, **CNNs**, and **GANs**.
- Statistical Inference: Created written homework and an **R** project on **statistics**, **data analysis**, and **visualization**.

- **SynApps** Tehran, Iran
  Software Developer *Mar. 2020 - Oct. 2020*
  - Worked as a **Django backend developer** using **Python** to build a clinic management application that is currently being used by more than 14 hospitals and 8000 doctors
  - Implemented primary features that allow app users to organize crowded patient queues and submit medical history, lab tests, and radiology reports of the patients
  - Collaborated with an **interdisciplinary group** consisting of medical students and software developers
  - Developed the first version of the application API using **REST API** and **Swagger** documentation

- **Authin** Tehran, Iran
  Software Developer Intern *July 2019 - Sep. 2019*
  - Implemented parts of a central authorization service in **Java/Spring** , adding endpoints and tests, and participated in code reviews.

- **FojhunExsom** Tehran, Iran
  Software Developer *July 2017 - Nov. 2018*
  - Worked as a **frontend developer** to design and implement the UI of a web application using **JavaScript, jQuery, and Sass**. The application was part of a software solution specifically developed for POS systems.

Notable Projects

- Emotion Recognition of Speech: Collected and processed speech data for emotion recognition, extracting features like Chroma and Zero Crossing Rate. Developed **machine learning models** using **KNN, SVM, and MLP for classification**, and applied **clustering** methods such as **K-Means** and **DBSCAN** to analyze emotions like Anger, Disgust, and Sadness.
- My Portfolio : This project was an attempt to update my portfolio, refresh my knowledge of **React**, and deepen my skills in **Next.js, TypeScript, Tailwind CSS**, and modern **UI** component libraries such as **Shadcn and Aceternity UI**.
- Simple Chatbot : Developed a simple chatbot using the **OpenAI API** that creates a short user profile by asking targeted questions. The project aimed to build familiarity with the OpenAI API while gaining hands-on experience in **chain-of-thought reasoning, function calling, and role prompting**.
- BERT Implementation From Scratch : Implemented BERT from scratch, constructing all **Transformer** components, including the **encoder and multihead attention mechanisms**, to gain a deeper understanding of its core functionality.
- GAN Implementation : Implemented **Deep Convolutional GAN** from scratch, optimizing training with label smoothing, batch normalization, and noise addition. Also developed a **Wasserstein GAN (WGAN)** with customized loss functions to enhance performance.
- Job offer System : Built a job offer web app with **Java (Spring) backend**, **React frontend**, JPA database, and security features like JWT, Docker, and Kubernetes.
- Working with Testnet Network : Gained insights into Bitcoin mechanics by generating valid testnet addresses using SHA-256 and RIPEMD-160, simulating transactions with python-bitcoinlib, and testing the mining process with real blockchain data.
- Substitution Cipher Decoder: Implemented a decryption process using Genetic Algorithms, leveraging genes, chromosomes, fitness functions, and mutations to decode messages encrypted with a substitution cipher.

Honors

- Ranked 2nd, among master's students in Software Engineering 2022
- Ranked within the top 0.7% (145th) among approximately 18,000 participants in the computer engineering national master entrance exam for Iranian universities. 2021
- Ranked within the top 0.1% (237th) among approximately 181,000 participants in the computer engineering national master entrance exam for Iranian universities. 2015