

## Summary

- **Machine Learning Researcher** with expertise in developing **AI models**, having established a **pre-trained GAN** for **limited-labeled brain MRI segmentation**, advancing practical **AI** and **ML applications** and contributing to both **industry** and **research**.
- Passionate **AI Engineer** with over **5 years of experience** in **Computer Science**, possessing strong **technical**, **theoretical**, and **analytical** skills, including **model training**, **algorithm optimization**, and **problem-solving**.
- **Skilled Programmer** proficient in **Python** and other **programming languages**, along with modern **technologies**, with practical experience as an **iOS Developer** for an **international company**, demonstrating strong **technical expertise**, **teamwork**, and effective **communication** in **collaborative settings**.
- **Active Open-Source Contributor**, collaborating on **public** and **volunteer projects**, fostering **knowledge sharing** and providing **tools** for **developer** and **research communities**.

## Education

**Bachelor of Computer Engineering** - GPA: 3.57/4.00 (equivalent to 17.88/20)

Zand Institute of Higher Education

Sep 2021 - Aug 2025

Shiraz, Iran

**Visiting Student**

University of Science and Culture

Feb 2023 - Jul 2024

Tehran, Iran

## Research Interests

- Machine learning
- Computer Vision
- Deep Learning
- Computational Biology
- Natural Language Processing
- Scientific Computing

## Technical Skills

- **Programming & Scripting:** Python, C/C++, Julia, MATLAB, Swift, Objective-C, SQL, Bash, LaTeX, ...
- **Deep Learning:** Neural Networks, Image Processing, Natural Language Processing, Transformers, GAN, RAG
- **Tools & Platforms:** Jupyter, Google Colab, GitHub, GitLab, Command Line, Linux, macOS, Jira, Confluence, Trello, VS Code, Xcode
- **Data Science & ML:** TensorFlow/Keras, PyTorch, Scikit-learn, OpenCV, HuggingFace, NumPy, Pandas, Matplotlib
- **Software Development:** Git, CI/CD, Design Patterns, Architectural Patterns, SOLID, iOS Development, Unit Testing, TDD, BDD, Agile (Scrum, Kanban)
- **Databases & Cloud:** MLOps, Vector DBs, Relational DBs (SQLite, PostgreSQL), Firebase, Docker, Kubernetes, Query optimization, Cloud-based AI Model Deployment

## Publication

### Pre-Trained Generative Adversarial Network for Limited-Labeled Brain MRI Segmentation

Authors: Mehdi Karami\*, Dr. Betsabeh Tanoori

Code: To be released as open-source

\*Primary author, Manuscript in preparation

## Teaching Experience

### Teaching Assistant (TA)

Zand Institute of Higher Education, Shiraz, Iran

#### ▪ Fall 2024:

- Human-Computer Interaction
- Digital Electronics

#### ▪ Spring 2025:

- Fundamentals of Computer and Programming
- Digital Electronics
- Computer Architecture

## Work Experience

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**iOS Developer** (Full-time, On-site)  
Round Table Apps (Sydney, Australia)

Jun 2023 – Jun 2024  
 Development Office, Tehran, Iran

### Projects:

- Contributed to the development of **diverse, international-scale** projects across various domains.
- Developed **Blossom – Save and Invest**, a financial application for the **Australian** and **New Zealand** markets, serving over **25K** users.
- Maintained **MailPlus**, a post-transportation app designed for postal service drivers across **Australia**.
- Developed and refactored **Resilience Box**, a digital wellbeing platform with mental health resources and telehealth integration, optimizing performance by restructuring the codebase and replacing deprecated components.

### Technical Contributions:

- Conducted detailed research on the optimal utilization and development of **augmented reality (AR)** and **virtual reality (VR)** technologies, utilizing **visionOS** and other relevant technologies.
- Conducted research and analysis of **data flow** to identify **behavioral patterns** across various scenarios.
- Implemented algorithms for **financial calculations** and **optimizations**.
- Strengthened test coverage by adopting the **VIP architectural pattern**, ensuring well-structured, maintainable code.
- Applied key design patterns, e.g., **MVC** and **Repository**, to enhance code organization and scalability.
- Boosted development efficiency by up to **40%** through a custom file template, streamlining the development workflow.
- Improved product **quality** by leading collaborative code reviews, fostering a culture of continuous improvement.
- Engaged in **knowledge-sharing** sessions to promote best practices and stay informed on technological advancements.
- Contributed to the implementation of **Unit Testing**, leveraging **Behavior-Driven Development (BDD)** to ensure robust and reliable code across projects.
- Developed comprehensive **documentation** using **Confluence** and **Xcode DocC**, enhancing clarity and accessibility for both **Quality Assurance** and **iOS** teams.
- Collaborated cross-functionally with **iOS**, **Backend**, **QA**, **Design**, **Frontend**, and **Android** teams, employing **Scrum**, **Jira**, and other **agile management tools** to streamline workflows and improve delivery efficiency.

## Open Source Projects

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- **Cyberattack Detection and Anomalous Behavior Analysis**
  - Utilizes an LSTM-based RNN to detect cyberattacks from anomalous network traffic, including DDoS, port scanning, and brute-force attempts.
  - Stack: TensorFlow/Keras, Scikit-learn, PCA, ROC Curve, ...
- **Solar Power Generation Prediction**
  - Implements ML models (Linear, Decision Tree, Random Forest, Gradient Boosting, MLP, DNN) to predict solar power generation, evaluated via MAE, MSE,  $R^2$ , and confusion matrix.
  - Stack: TensorFlow, Scikit-learn, Pandas, NumPy, Seaborn, ...
- **NexumAI**
  - Provides an interface for training models (e.g., image classification, segmentation) without technical expertise, letting users obtain trained models by supplying datasets and configurations.
  - Stack: TensorFlow, PyTorch, Torchvision, PyQt6, ...
- **AI Sight Quest**
  - Utilizes AI to extract text from images via Apple's Vision Framework and provides instant answers to document questions using the Bidirectional Encoder Representations from Transformers (BERT) language model.
  - Stack: BERT-SQuAD, Swift, SwiftUI, SwiftData, Apple's Vision and Speech Frameworks, TipKit, Protocol-Oriented Programming (POP), Model-view-viewmodel (MVVM), ...

### ▪ Numeric Prediction

- Utilizes collected car price records, applying preprocessing (e.g., normalization, standardization) to handle multilingual values, and implements KNN, Decision Tree, Random Forest, and Gradient Boosting algorithms.

### ▪ Arduino Heart Rate Monitor (BPM Counter)

- Measures heart rate with an Arduino Uno and displays a real-time pulse waveform.
- Stack: Arduino C/C++, Programmable Logic Controller (PLC), Sensor Integration, Display Handling, ...

### ▪ Character Classification Using Perceptron

Neural Network Design,  
Forward/Backward Propagation,  
Sigmoid, Softmax, Cross-Entropy, ...  
Stack: pure NumPy

### ▪ Information Retrieval

Stopword Removal, Lemmatization,  
Stemming, Tokenization,  
Inverted Index, Boolean Model, ...  
Stack: NLTK, inflect

Additional projects can be found at: [GitHub account](#).

## Volunteering

### Workshop on Git and GitHub

Zand Institute of Higher Education

Dec 2024

Shiraz, Iran

### Workshop on Git and GitHub (Techniques for Effective Collaboration)

Credential ID 400434784

K. N. Toosi University of Technology

May 2024

Tehran, Iran

### Contributor of Swift Evolution GitHub Repository

Participated in the proposals of the Swift Evolution repository.

Since Dec 2023

## Honors & Awards

### Winning First Place in the C++ Programming Language Competition

Hosted by Zand Institute of Higher Education

May 2022

Shiraz, Iran

## Certificates

### ▪ Swift for Beginners

Issued by Mind Luster

Credential ID 1688271634

Mar 2023

### ▪ Theoretical understanding of Swift 4

Issued by Sololearn

Credential ID CT-QD4IETGO

Jan 2023

## Language

**English:** Fluent

**Persian–Turkish:** Native

## TOEFL

**Total Score: 89**

▪ **Reading: 23**

▪ **Listening: 22**

▪ **Speaking: 19**

▪ **Writing: 25**

## Extracurricular Activities

▪ Swimming

▪ Traveling

▪ Cooking International Cuisine

▪ Esports Gaming (LOL)