Mehdi Karami

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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) — Sep 2021 - Aug 2025
Zand Institute of Higher Education — Shiraz, Iran

Visiting Student — Feb 2023 - Jul 2024
University of Science and Culture — 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 — *Primary author, Manuscript in preparation
Code: To be released as open-source

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

iOS Developer (Full-time, On-site) Jun 2023 – Jun 2024
Round Table Apps (Sydney, Australia) 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

- **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 Dec 2024
Zand Institute of Higher Education Shiraz, Iran

Workshop on Git and GitHub (Techniques for Effective Collaboration) May 2024
Credential ID 400434784 Tehran, Iran
K. N. Toosi University of Technology

Contributor of Swift Evolution GitHub Repository Since Dec 2023
Participated in the proposals of the Swift Evolution repository.

Honors & Awards

Winning First Place in the C++ Programming Language Competition May 2022
Hosted by Zand Institute of Higher Education 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)