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 — *Corresponding 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 **BDD** to ensure robust and reliable code across projects.
- Developed comprehensive **documentation** using **Confluence** and **Xcode DocC**, for both **QA** 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
K. N. Toosi University of Technology — Tehran, Iran

Contributor and participant in proposals on Swift Evolution GitHub Repository — Since Dec 2023

Honors & Awards

Winning First Place in the C++ Programming Language Competition — May 2022
Zand Institute of Higher Education — Shiraz, Iran

Hobbies

- Swimming
- Traveling
- Cooking International Cuisine
- Esports Gaming (LOL)