Mehdi Karami

✉ karami.mehdi.scholar@gmail.com   📞 +98 (990) 956-2438
📍 Shiraz, Iran
⌨ github.com/karami-mehdi   in linkedin.com/in/karami-mehdi

Summary

- Machine Learning Researcher with expertise in developing AI models, having established a pre-trained GAN for limited-labeled brain MRI segmentation, producing advances in automated neuroimaging and contributing to scientific and clinical research.
- Skilled Programmer proficient in multiple programming languages and technologies, with practical experience as an iOS Developer for an international company, having led workshops and won first place in a coding competition, which demonstrate 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
- Computational Biology
- Deep Learning
- Scientific Computing
- Computer Vision
- Algorithm Design

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   Jun 2023 – Jun 2024
Round Table Apps   Development Office, Tehran, Iran

Contributed to the development of diverse, international-scale applications across various domains, including healthcare, finance, and postal transportation.

- **Resilience Box**
  - Healthcare app focused on mental health management, providing online learning resources, well-being videos, an in-depth podcast series, informational fact sheets, and access to counseling and coaching services.

- **Blossom – Save and Invest**
  - Savings app that helped users in Australia and New Zealand reach their financial goals faster by providing access to high-interest savings products.

- **MailPlus**
  - Postal transportation app designed for postal service drivers across Australia.

Technical Contributions:

- Utilized architectural and design patterns, such as Repository, VIP, MVC, and Clean Architectures, to manage project structure and layers.

- Conducting detailed research on the optimal utilization and development of augmented reality (AR) and virtual reality (VR) technologies, utilizing visionOS and other relevant technologies.

- Performed comprehensive research and analysis of data flow to ascertain the behavioral patterns of applications across various scenarios.

- Applied optimization techniques for real-time data processing.

- Implemented algorithms for financial calculations and optimizations.

- Conducted Behavior-Driven Development (BDD) to ensure robust and high-quality code.

- Created detailed documentation with Xcode DocC and Confluence.

- Collaborated with iOS and other teams including BackEnd, Test, Design, FrontEnd, and Android teams, using Scrum, Jira, and other management tools.

Open Source Projects

- **Cyberattack Detection and Anomalous Behavior Analysis**
  - Utilizes a Recurrent Neural Network (RNN), technically Long Short-Term Memory (LSTM), to detect cyberattacks based on anomalous behavior in network traffic. The model identifies abnormal patterns associated with attacks, e.g., DDoS, port scanning, and brute-force attempts.
  - Stack: Python, Keras (TensorFlow), Scikit-learn, Principal component analysis (PCA), Receiver Operating Characteristic (ROC) Curve, . . .

- **Solar Power Generation Prediction**
  - Implements multiple machine learning models, i.e., Linear Regression, Decision Tree Regressor, Gradient Boosting Regressor, Random Forest Regressor, Multi-layer Perceptron (MLP) Regressor, and Deep Neural Network (DNN), to predict solar power generation. Models are evaluated using performance metrics such as Mean Absolute Error (MAE), Mean Squared Error (MSE), Coefficient of Determination (R^2), and Confusion Matrix to ensure accurate predictions.
  - Stack: Python, Scikit-learn, TensorFlow, Pandas, Matplotlib, NumPy, Seaborn, ...

- **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: Machine Learning, Deep Learning, Swift, SwiftUI, SwiftData, Model-view-viewmodel (MVVM), Vision Framework, Speech Framework, TipKit, . . .

- **Proximity Finder**
  - Efficiently detects the nearest point pair on a 2D screen with O(n log n) complexity using Divide and Conquer. Includes an interactive slider for dynamic point adjustment.
  - Stack: Swift, UIKit, Model-View-Controller (MVC), Algorithm Design, Algorithm Optimization, Core Graphics, . . .

- **Heart Pulse Detector - Beats Per Minute (BPM) Counter**
  - Programs a BPM calculator using an Arduino Uno to monitor heart rate and display pulse data through a real-time heart rate graph.
  - Stack: Arduino C/C++, Data Processing, Sensor Integration, Display Handling, ...

- **Command-line Game**
  - Designs and implements interactive command-line games, emphasizing scalable architecture, efficient logic processing, and a seamless user experience.
  - Stack: Swift, Protocol-Oriented Programming (POP), Clean Architecture, . . .

Additional projects can be found at: <u>GitHub account</u>.

Volunteering

Workshop on Git and GitHub   Dec 2024
Zand Institute of Higher Education   Shiraz, Iran

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

Contributor of <u>Swift Evolution GitHub Repository</u>   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

<u>Swift for Beginners</u>   Issued by Mind Luster
Credential ID 1688271634   Mar 2023

<u>Theoretical understanding of Swift 4</u>   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)

References

- **Dr. Betsabeh Tanoori**
  Associate Professor
  Department of Computer Engineering
  Zand Institute of Higher Education
  Shiraz, Iran
  `b.tanoori@zand.ac.ir`

- **Dr. Azadeh Tabatabaei**
  Associate Professor
  Department of Computer Engineering
  University of Science and Culture
  Tehran, Iran
  `a.tabatabaei@usc.ac.ir`

- **Dr. Amir Hossein Rasekh**
  Associate Professor
  Department of Computer Engineering
  Zand Institute of Higher Education
  Shiraz, Iran
  `ahrasekh@zand.ac.ir`