Mehran Alam Beigi

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MEDICAL ENGINEERING STUDENT & CREATIVE DEVELOPER

Mehran Alam Beigi is a Medical Software Developer with a background in web and mobile application development and a current focus on biomedical engineering. At Aramed, he has developed advanced medical analysis tools particularly in foot pressure mapping, gait analysis, and 3D surface modeling by combining software engineering expertise with domain-specific medical knowledge. His prior experience in the tech industry has built a solid foundation in problem-solving, programming, and system design, which he now applies to medical software challenges. Mehran thrives in creative, interdisciplinary teams where he can grow both technically and intellectually. He is deeply committed to lifelong learning and innovation, continuously exploring new tools and techniques to develop impactful health technologies.

STRENGTHS AND EXPERTISE

Problem Solving	Programming[Python, DataStructure] Algorithm	MRI Fundamentals,
Creative	Mathmatics	Communication hardworker
Active	Database	Analysis of financial events
Responsible	MRI	pragmatic
Data Analysis & SQL		Data processing

PROFESSIONAL EXPERIENCE

Aramed - Arman Tajhiz Medisa
Medical Software Developer

Apr 2025 - Jul 2025

- **Project**: 3D Human Foot Volume Reconstruction
  Technologies: Python, Trimesh, NumPy, SciPy, Shapely, AlphaShape, KDTree
  Description: Developed a Python-based 3D mesh processing pipeline to generate a watertight volumetric model of a human foot from STL scan data. The project involved constructing a custom bottom surface using alpha shapes derived from scaled XY projections of the top mesh, and generating smooth side walls by connecting boundary vertices via KDTree nearest-neighbor matching. Utilized libraries such as Trimesh, NumPy, SciPy, and Shapely to ensure geometric consistency, eliminate self-intersections, and create a clean, closed STL file suitable for 3D printing and biomechanical simulation.

- **Project**: Foot Pressure Analysis and Visualization System (C# / Medical Data Analysis)
  Technologies: C# .NET · Bitmap & image processing · Custom matrix-to-image conversion · Real-time sensor data visualization · 2D/3D geometry analysis
  Description: Developed an advanced real-time foot pressure analysis application using WPF and C#, capable of loading custom .mdsf sensor data files, dynamically segmenting foot zones (heel, midfoot, forefoot, toes), and visualizing pressure distributions over time. Implemented Center of Pressure (COP) tracking, dynamic foot sample processing, custom boundary interpolation, and zone classification using 2D matrix inputs. Enhanced the system with automated wall and surface generation for 3D modeling and analysis.

Project: Networked 3D Printer Farm Management System (Raspberry Pi / Klipper / Automation)
Technologies: Raspberry Pi · Klipper Firmware · CAN Bus Communication · USB-to-CAN Adapters · Python · Moonraker API · Mainsail · Servo Motor Control · G-code Automation
Description: Designed and implemented a scalable multi-printer 3D printing farm using Raspberry Pi as the central controller. Connected multiple printers via a LAN switch and controlled them through Klipper firmware using CAN Bus over USB adapters. Developed a REST API and Python-based queuing system for G-code distribution and monitoring. Integrated a mechanical part removal system using servo-driven ejector arms for fully automated operation. Enabled real-time job tracking, printer health monitoring, and autonomous print cycles with minimal user intervention.

PROJECTS

User Clustering in Social Networks

January 2025- January 2025

Implementation of clustering algorithms such as K-Means, DBSCAN, and Agglomerative Clustering.

This project focuses on clustering users in social networks based on their interactions and extracted features. The primary goal is to identify meaningful user communities, which can be beneficial for applications like personalized recommendations, targeted marketing, and network analysis.
The project employs unsupervised learning algorithms to detect user groups, utilizing methods such as K-Means Clustering, DBSCAN (Density-Based Spatial Clustering of Applications with Noise), and Agglomerative Hierarchical Clustering. **K-Means** partitions users into a predefined number of clusters by minimizing intra-cluster variance, while DBSCAN identifies core groups based on density, filtering out noise. Agglomerative clustering, on the other hand, follows a hierarchical approach to merge similar users step by step.
The development process includes multiple stages:

1. **Data Preprocessing**, where the social network data is cleaned and structured.
2. Feature Engineering, which involves extracting key network metrics such as degree centrality, clustering coefficient, and interaction frequency.
3. **Clustering Implementation**, where various clustering algorithms are applied to group users.
4. Evaluation & Optimization, utilizing metrics like silhouette score and Davies-Bouldin index to assess clustering effectiveness.
5. **Interpretation & Insights**, analyzing the discovered user communities for real-world applications.

The results include visualizations of clustered user distributions, network graphs, and comparisons of different clustering techniques. Future work can explore deep learning-based clustering, enhanced feature selection, and scalability for large datasets to improve accuracy and applicability.

- **Click and see:** https://github.com/Mehranalam/User-clustering-in-social-networks

FaceRecognition

January 2025- Feb 2025

This project implements a face recognition system using machine learning techniques, focusing on detecting and recognizing faces in images or videos with high accuracy. It employs HOG (Histogram of Oriented Gradients) and CNN-based deep learning models for face detection, while the recognition phase relies on facial embeddings extracted using a **deep neural network** (DNN). These embeddings are compared against a stored database using Euclidean distance or SVM classifiers.
The development process follows several stages: data preprocessing, where images are cleaned, converted to grayscale, and normalized; face detection, which leverages OpenCV and dlib's pre-trained models; feature extraction, using a deep learning model like ResNet to obtain meaningful face representations; and classification, employing techniques such as SVM and k-NN classifiers to match recognized faces. Further improvements involve hyperparameter tuning and model fine-tuning to optimize accuracy.
The project can be expanded by integrating real-time face recognition, enhanced accuracy with deep learning, and user-friendly interfaces for practical applications. It serves as a fundamental implementation for face recognition, useful in various security, authentication, and surveillance applications.

- **Click and see:** https://github.com/Mehranalam/FaceRecognition

Data Mining Project

January 2025- Feb 2025

This project utilizes data mining techniques to uncover patterns in large datasets, involving data preprocessing, exploratory data analysis, classification, and clustering. It employs supervised learning algorithms like Decision Trees, Random Forest, and SVM for classification, and unsupervised methods such as K-Means and DBSCAN for clustering similar data points.

The structured development pipeline includes:

1. Data Collection & Cleaning
2. Feature Engineering & Selection
3. Model Training & Evaluation
4. Result Interpretation & Visualization

The goal is to enhance data-driven decision-making, with future improvements focusing on deep learning feature extraction, better dimensionality reduction, and scalability for big data processing.

- **Click and see:** https://github.com/Mehranalam/super-carnival

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OTHER LOVELY PROGRAMMING PROJECTS

01

PyTex

Implementing a typesetting system for mathematical formulas using TeX algorithms and fonts inside Python without relying on an external TeX installation is a complex task

- **Click and see:** https://github.com/Mehranalam/PyTex

02

PyDown

A simple project to convert .md files into a coherent .html file. a simple Markdown-to-HTML converter in Python without using the markdown library. We'll manually parse the Markdown syntax and convert it to HTML.

- **Click and see:** https://github.com/Mehranalam/PyDown

03

Javton

a library to integrate a JavaScript interpreter with Python from scratch involves several steps. The most common approach is to use an existing JavaScript runtime like Node.js or Duktape and interact with it from Python.

- **Click and see:** https://github.com/Mehranalam/Javton

04

HTTP-Communication

This library serves as a wrapper for cURL, offering its features in classes and interfaces for Java and Android projects. It is designed to run on all JVM platforms. Integrating a JavaScript interpreter with Python typically involves using an existing runtime like Node.js or Duktape. Additionally, it includes a platform-independent terminal kit with a long history.

- **Click and see:** https://github.com/Mehranalam/HTTP-Communication

Check out my other projects, organized into other interesting areas, on my GitHub.

Studying the educational, career, and immigration paths of Iranian professionals in the field of Information and Communication Technology (ICT) from LinkedIn **Feb 2025 - April 2025**

Read README.md of project in github have more and technical description.

- **Click and see:** https://github.com/Mehranalam/ICT-dataAnalyic_LinkedinDataSet

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COURSES

Introduction to Medical Software

Yale University

This class offers an overview of medical software, featuring Yale professors and industry experts who relate course concepts to real-world applications. Topics include medical device regulations, data privacy, cybersecurity, quality management, and the medical software life cycle, covering user needs, system requirements, design, coding, testing, and validation.

- Credit check: https://coursera.org/share/9ac6931b63500c0e7a42b22929045e1c

MRI Fundamentals

Korea Advanced Institute of Science and Technology (KAIST)

In this course learners will develop expertise in basic magnetic resonance imaging (MRI) physics and principles and gain knowledge of many different data acquisition strategies in MRI. In particular, learners will get to know what is magnetic resonance phenomenon, how magnetic

- Credit check: https://coursera.org/share/10f28666108531b31d789ef7cac59d6a

Python Data Structures

University of Michigan

This course will introduce the core data structures of the Python programming language. We will move past the basics of procedural programming and explore how we can use the Python built-in data structures such as lists, dictionaries, and tuples to perform increasingly complex data analysis. This course will cover Chapters 6-10 of the textbook “Python for Everybody”. This course covers Python 3.

- Credit check: https://coursera.org/share/8a9591474b18ed935259eeb46c79a554

EDUCATION

Engineering, Biomedical/Medical Engineering **Sep 2022 - Dec 2026**

Islamic Azad University Central Tehran Branch - Bachelor's degree

Grade: 16.30

- Presentation: Physiological presentation of the respiratory system in the form of a conference - review of the function and mechanism of the Resp System - You can see this at My Linkedin Account.

Mathematics **Jan 2019 - Jul 2022**

Dr. Ali Shariati High School - Diploma in Mathematics-Physics

Grade: 17.23

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