Pouya Karimian

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Education

09/2018-09/2021
Tehran, Iran

M.Sc | Healthcare Systems Engineering
Amirkabir University of Technology

Main focus: Machine learning and data science in healthcare
Thesis: Human pose estimation for elderly
GPA: 19.03/20-4/4
Relevant coursework:

- Selected topics in indust.eng. (machine learning in healthcare)
- Data-driven modeling in healthcare
- Operations research in healthcare
- Modeling, optimization and computer simulation of health systems
- Fuzzy sets in decision making and planning
- Healthcare Informatics

Online coursework (Coursera):

- Machine learning | Stanford (certificate)
- Deep learning specialization | DeepLearning.AI (certificate)
- Using Python to interact with operating system | Google (certificate)
- Crash course on python | Google (certificate)
- TensorFlow Developer Professional Certificate | DeepLearning.AI (certificate)
- Introduction to Git and Github | Google (certificate)

09/2014-09/2018
Tehran, Iran

B.Sc | Industrial Engineering
Amirkabir University of Technology

Main focus: Data analysis and optimization
Final project: Simulation of dosage and frequency of Aspirin intake based on Markov chain
GPA: 17.66/20-3.75/4 (last two years)
Relevant coursework:

- Probability theory and applications
- Engineering statistics
- Management information systems
- Linear algebra
- Operations Research (I) and (II)
- Principles of simulation

Research Interests

Machine Learning, Optimization, Computer Vision, Adversarial Machine Learning

Relevant Experiences

Teaching experience

01/2020-07/2020

teaching assistant
Fuzzy sets in decision making and planning (graduate course)
Industrial Engineering Department, Amirkabir University of Technology

- Supervisor: Dr gamasaee
- Holding tutorials on Matlab basics and fuzzy library in Matlab
- Managing online discussion group for student queries

01/2019-07/2020 **teaching assistant**
Introduction to simulation (undergraduate course)
Industrial Engineering Department, Amirkabir University of Technology
- Supervisor: Prof. Ahmadi
- Holding tutorials on Matlab basics and simulation examples coding in Matlab and Arena
- Grading assignments and Managing online discussion group for student queries

Research experience

10/2021-10/2022 **research assistant**
Information Technology Research Department
Iranian Research Institute for Information Science and Technology
- Supervisor: Prof. Fakhrzadeh
- conducted research on segmentation of histology images using deep learning

01/2019-09/2021 **Master's student**
Health Systems Laboratory, Amirkabir University of Technology
- Supervisors: Prof. Ahmadi, Prof. Jalalimanesh
- conducted research in the area of computer vision in healthcare
- proposed a new CNN for human pose estimation in elderly care

Professional experience

03/2017-12/2018 **product manager**
Habiox(intelligent physiotherapy assistant)
- Worked in a team and led the group for making a software with Kinect for patients need physiotherapy exercises

07/2018-09/2018 **intern**
Decision Support System Lab
Iranian Research Institute for Information Science and Technology
- Analysis of static work using discomfort recording with Kinect
- programming a Matlab code that analyzes posture by OWAS method and input of Kinect

Skills

Programming	**python**[PyTorch, Tensorflow, OpenCV, scikit-learn, Albumentations] **Matlab**[Statistics and Machine Learning, Image processing, Fuzzy Logic and Optimization Toolbox]
Softwares	**Git** - LaTeX - **Microsoft office**[word,excel,powerpoint,visio] **Simulation tools**[Netlogo - Arena]
Languages	**Persian**: Native **English**: Advanced
Test scores	**TOEFL**: 104 - Reading:29 Listening:28 Speaking:23 Writing:24(15th October 2022) **GRE**: to be taken on 15th October 2023)

Honors and Awards

- Member of **"Excepted talents"** of Amirkabir University of Technology in Masters period and receiving grant
- Ranked **5th** in the 2018 Iran Universities Olympiad on Industrial Engineering containing optimization, probability theory, and engineering statistics (certificate in Persian)
- Ranked among top **1 percentage** in both national graduate entrance exam in industrial engineering and national undergraduate entrance exam

Projects and Publications

Deep learning-based method for segmenting epithelial layer of tubules in histopathological images of testicular tissue

A Fakhrzadeh*, **P Karimian***, M Meyari*, CL Luengo Hendriks, L Holm, C Sonne, R Dietz, E Spörndly-Nees
(* equal contribution)
Journal of Medical Imaging, 2023
Code PDF
Deep learning | Image segmentation | CNN | Histology image | Seminiferous tubules

Human pose estimation for elderly care

M.Sc. Thesis
Industrial engineering department, Amirkabir university of technology, 2021
Proposed a new CNN for human pose estimation that is enable to capture multi-scale features and also deal with occlusion.
Deep learning | Computer vision | Human pose estimation | Elderly care

Simulation of dosage and frequency of Aspirin intake based on Markov chain

B.Sc. final project
Industrial engineering department, Amirkabir university of technology, 2018
Simulating different dosage and frequency of Aspirin intake in order to evaluate quality of life in patients with heart diseases. this Monte-Carlo simulation is based on Markov chain and transition probabilities.
Markov chain | Transition probabilities | MC simulation

Nucleus detection in divergent images from 2018 Data Science Bowl dataset

Implementing the classic U-Net in TensorFlow and preprocessing and postprocessing the diverse cell images in order to segmenting nuclei
December 2019
Python | TensorFlow | Machine learning | Computer vision | Image segmentation

Evaluating the impact of different policies on healthcare of countries around the world: a data-driven approach

Fit a fixed effect regression on WHO dataset in R. using the model for finding the most effective variables for finding the best policy for improving the overall healthcare in a country
November 2019
R | Fixed effect | Regression | Panel data | Healthcare

Implementing fuzzy clustering algorithms in Matlab

Coding fuzzy clustering algorithms like fuzzy C-means and Gustafson-Kessel on Iris dataset, tuning the parameters, visualizing dataset and clusters
May 2019
Matlab | Clustering | Fuzzy

An agent-based model for evaulating the effect of different policies on controling hypertension in Tehran adult population

Propose a new agent-based model based on ODD protocol coded in Netlogo, evaluating different policies like public advertisements and screening
April 2019
Netlogo | Agent-based modeling | Simulation | Hypertension

A TSK fuzzy rule-based system for calculating diabetes risk

Making a TSK fuzzy rule-based system for calculating diabetes risk in Matlab fuzzy tool box, tuning the parameters of system with ANFIS (Adaptive Neuro Fuzzy Inference System)
March 2019
Matlab | Fuzzy | ANFIS | Rule-based system

Matlab code for classifying Diabete patients using Pima dataset

implementing models like KNN and minimum distance algorithms, drawing ROC curve and computing measures like sensitivity, specifity, precision, acuuracy

December 2018

Matlab | Machine learning | Classification | Diabetes | ROC

Matlab code for facility location of emergency centers

Coding and solving set covering and maximal covering optimization models for a simple facility location problem

November 2018

Matlab | Optimization | Set covering | Maximal covering

Matlab code for resources allocation using dynamic programming and Q-learning

Calculating transition probabilities and rewards based on the Markov decision model, coding dynamic programming and Q-learning to solve a simple problem like human resource allocation in a medical center

November 2018

Matlab | Dynamic programming | Q-learning | Optimization | Resources allocation