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Zahra Fazel

Website
LinkedIn
Github

Education

B.Sc. Computer Engineering, Sharif University of Technology, Tehran, Iran **Sep 2017 — Feb 2022**

- GPA: 17.06/20 (3.52/4)
- Thesis Advisor: Prof. H. R. Rabiee
- Thesis Title: Interpretability of U-Net Model in the Segmentation and Classification of Medical Images

Diploma in Mathematics and Physics, Farzanegan Amin 1, Isfahan, Iran **Sep 2013 — Jun 2017**

- Affiliated with the National Organization for Development of Exceptional Talents
- GPA: 19.67/20 (4/4)

Research Interests

- Applied Machine Learning
- Deep Learning
- Computer Vision
- Natural Language Processing
- Medical Image Analysis
- Interpretable AI

Research Experiences

Research Assistant **Jun 2021 — Present**

Supervisor: Prof. H. R. Rabiee
Data Science and Machine Learning Lab (DML), Sharif University of Technology
My project was the Interpretability of Segmentation Models with a focus on medical applications. I have tried to find new and innovative ways to make segmentation models interpretable using the legacy methods in classification. As a solution, I developed a wrapper function that performs the classification interpretability methods pixel-wise and then combines them. Currently, I am working on the evaluation of the interpretation of segmentation.

Research Assistant **Nov 2020 — Present**

Supervisor: Prof. M. H. Rohban
Bioinformatics and Computational Biology (BCB) Lab, Sharif University of Technology
My project was the Design of An Automatic Orthodontic Diagnosis and Cephalometric Analysis Tool. I developed several semi-supervised and self-supervised models to solve this problem since our labelled dataset was very small and we had a large unlabelled dataset. I also tried to solve this problem differently: I split the problem into two separate landmark detection and classification tasks. I developed several CNN regression and segmentation models for landmark detection. Currently, I work on error analysis of these models to improve them.

Teaching Experiences

Teaching Assistant **Sharif University of Technology**

- Engineering Probability and Statistics - Prof. A. Sharifi — Sep 2021 — Present
- Design of Algorithms - Dr. M. Seddighin — Feb 2021 — Jun 2021
- Engineering Probability and Statistics - Dr. A. Najafi — Feb 2021 — Jun 2021
- Numerical Computations - Dr. F. Baharifard — Feb 2021 — Jun 2021
- Data Structures and Algorithms - Dr. M. Seddighin — Sep 2020 — Jan 2021
- Engineering Probability and Statistics - Prof. A. Motahari — Sep 2020 — Jan 2021
- Data Structures and Algorithms - Dr. M. Seddighin — Sep 2019 — Jan 2020
- Advanced Programming - B. Hatami and M. Mostafazadeh — Feb 2019 — Jun 2019

Work Experiences

Intern, Payam Pardaz, Isfahan, Iran **Jul 2020 — Sep 2020**
As a Qt and C++ develper, I worked on Ravin EDR, a service for windows systems that tracks and records events such as kernel-level activities and events related to processes and file system.

Intern, Payam Pardaz, Isfahan, Iran **Jul 2019 — Sep 2019**
As a Qt and C++ develper, I worked on Ravin Network and Log Management, which monitors servers, network infrastructure devices, security devices, network services, database, etc., extracts all network traffic flows and detects network anomalies using pre-defined rules.

Skills

Programming	Python, Java, C, C++, C#, R
Frameworks	Pytorch, Tensorflow, Keras, Django, Android, Qt
Libraries	Pandas, NumPy, Scikit-Learn, Matplotlib, PIL
Databases	SQL, Mongo DB
Verison Control	Git
Typesetting	Latex
Soft Skills	Active listening, Creativity, Decision-making, Teamwork, Critical thinking, Flexibility, Desire to learn

Languages

- Persian (Native)
- English (TOEFL iBT: 106)
- German (B1)

Honors

- Member of Iran's National Elites Foundation
- Ranked 140th among 137788 participants in National University Entrance Exam (Top 0.1%)

Volunteer Experiences

Mentor of Blockchain Workshop, Computer Science Summer School **Sep 2020**
Computer Science Summer School (CSss) is an event held by Rasta Scientific Association whose purpose is to teach computer science fields and team working to high school students. I led students to learn basic blockchain concepts by solving simplified real-world problems.

Head of Cryptography Workshop, Computer Science Summer School **Sep 2019**
I designed the workshop so that students learn fundamental cryptography concepts such as symmetric encryption systems, Diffie-Hellman key exchange protocol, and RSA encryption system by solving simplified real-world problems and supervised mentors during the workshop.

Mentor of Data Mining Workshop, Computer Science Summer School **Sep 2019**

Executive Staff, Sharif Data Days **Mar 2019**

Scientific Staff, Sharif Capture the Flag **Feb 2019**

Head of Cryptography Workshop, Computer Science Summer School **Sep 2018**

Mentor of Recommender Systems and Game Theory Workshops, Computer Science Summer School **Sep 2018**

Executive Staff, Winter Seminar Series in Advanced Computer Science **Dec 2017**

Executive Staff, ACM International Collegiate Programming Contest Asia Region **Nov 2017**

Mentor of Algorithms and Recommender Systems Workshops, Computer Science Summer School **Sep 2017**

Indtructor of Students' Research Group, Isfahan Mathematics House **Apr 2017 - Sep 2017**
The Isfahan Mathematics House was founded to popularize and spread mathematics and be a suitable platform for the acquaintance of students with the history and various aspects of mathematical sciences. High school students might join one of several research groups to learn more about research. I was one of the instructors of the cryptography research group.

Certificates

Structuring Machine Learning Projects, Coursera (certificate) **Oct 2021**

Improving Deep Neural Networks, Coursera (certificate) **Oct 2021**

Neural Networks and Deep Learning, Coursera (certificate) **Jul 2021**

Task-Oriented Course in Artificial Intelligence and Machine Learning, Quera (certificate) **Jun 2021**

Advanced Python Programming and Object-Oriented Thinking, Quera (certificate) **Jun 2021**

Summer School of Intelligent Learning, Institute for Research in Fundamental Sciences (IPM) (certificate) **Aug 2019**

Selected Courses

Introduction to Programming	20/20	Advanced Programming	18.8/20
Discrete Structures	17.5/20	Engineering Probability and Statistics	19.5/20
Data Structures and Algorithms	19.1/20	Artificial Intelligence	18/20
Design of Algorithms	17.3/20	Database Design	17.2/20
Advanced Information Retrieval	17.3/20	Mobile Programming	20/20
Computer Simulation	20/20	Compiler Design	20/20
Data and Network Security	18.5/20	System Analysis and Design	20/20

Convolutional Neural Networks for Visual Recognition (online course - cs231n)

Selected Academic Projects

- Pacman (code)
  Designed Pacman game as the project of introduction to programming course in C.
- Farm Frenzy (code)
  Designed Farm Frenzy game as the project of advanced programming course in Java.
- Weather Forecast (code)
  Designed a weather forecasting app using several APIs as one of the mobile programming course projects in Java and Android.
- Photo Editor (code)
  Design a photo editor app as one of the mobile programming course projects in C++, Java, and Android.
- Persian Information Retrieval System (code)
  Designed a traditional infromation retrieval system for persian wikipedia dataset using vector space model as one of the advanced information retrieval course projects in python.
- News Classification (code)
  Applied several machine learning methods, such as KNN, SVM, Random Forest, etc., on the AG News dataset as one of the advanced information retrieval course projects in python.
- Web Crawling & Link Analysis (code)
  Designed a web crawler on semanticscholar.org and applied link analysis methods to score authors as one of the advanced information retrieval course projects in python using elasticsearch.
- C-Minus Compiler (code)
  Designed compiler backend for C-Minus grammar as the project of compiler design course in python.
- Online Music Platform (code)
  Designed an online music platform like Spotify as the project of system analysis & design course in python using django framework.