

MOHAMMAD HOSEIN ZAREI

(+98) 921 546 5415 | [Gmail](#) | [Linkedin](#) | [Github](#)

EDUCATION

B.Sc. of Computer Engineering

Shahid Beheshti University

Tehran, Iran

2017 – Present

- **Current GPA:** 3.4/4 (16.53/20) — 3.8/4 (17.89) last year

RESEARCH EXPERIENCE

BitHAA: Hardware Assisted Arithmetic Support For BitSlice Computation

2021

IPM

Tehran, Iran

- We proposed a hardware-assisted framework to provide computing infrastructure for BitSlice execution capable of single-bit SIMD operations.
- I developed some applications (LeNet-5 CNN, A Simple RNN, LSTM, Edge Detection, SHA-256) using C programming language for the framework to evaluate our proposed method, which gained **2x** performance increase over the baseline method.
- The paper was submitted to the [ASPLOS 2022 Conference](#) (under review), under the supervision of [Dr. Dara Rahmati](#) and [Dr. Saeid Gorgin](#).

Scalable Kernel Load-Balancing for Parallel SPH Simulation

2020

IPM

Tehran, Iran

- Proposed a load-balancing method with a new thread assignment paradigm for implementation of SPH simulation, which could be scaled into multi-GPU real-time simulations.
- Our method focuses on internally balancing the computation load among GPU threads. Gaining 73% performance increase on RTX 2080 Ti for a dam break scenario with 1M particles.

Fault Prediction in Competitive Programming Codes

2019

Shahid Beheshti University

Tehran, Iran

- Developed a machine learning model able to predict line-level faults in a dataset gathered from the [CodeForces](#) website.
- The model used different types of line-level features extracted from the codes to predict the faulty areas, gaining over 70% accuracy in predicting the faulty areas.
- This work was done under the supervision of [Dr. Mojtaba Vahidi-Asl](#).

TEACHING EXPERIENCE

Teacher Assistant

SBU, Tehran, Iran

- Internet Engineering (Dr. Parham Alvani)
- Fundamentals of Computer Vision (Dr. Yaser Esmaili Salehani)
- Computer Architecture (Dr. Dara Rahmati)
- Microprocessors and Assembly (Dr. Seyed-Hosein Attarzadeh-Niaki)
- Microprocessors and Assembly (Dr. Dara Rahmati)
- Specialized Language (Dr. Mojtaba Vahidi-Asl)
- Computational Intelligence (Dr. Hamed Malek)
- Introduction to Programming - C++ (Dr. Ali Akbari)
- Discrete Mathematics (Dr. Farshad Safaei)

Spring 2021

Spring 2021

Fall 2019, Fall 2020

Fall 2020

Spring 2020

Fall 2019

Fall 2019

Fall 2019

Fall 2018, Spring 2019

Teacher

SBU, Tehran, Iran

- Online AI course for Fall 2019 Freshmen ([Link](#))
- SBU AMC Online Deep Learning Course ([Link](#))

Oct 2020

Spring 2021

WORK EXPERIENCE

Research Assistant

Dec 2019 – Present

IPM

Tehran, Iran

- Founded in 1989, IPM is the greatest research center in Iran, comprised of 9 schools in different areas of knowledge.
- As a member of the CS school (**HPC Center**), I was introduced into new fields of computer science and significantly enhanced my research capabilities.

Data Scientist

Aug 2021 – Present

Digikala

Tehran, Iran

- Founded in 2006, Digikala is the biggest e-commerce company in Iran, with 13 companies under its direct supervision, more than 8,000 employees, and a user-base of 40+ million people.
- Developed an **Image Embedding** system able to recognize the content-based features of near 6M product images and find similarities between them in the embedding space.
- Developed a **Color Detection** model using Deep Learning, which helps the customers filter their desired products with more ease.

SELECTED ACADEMIC PROJECTS

Elevator Controller System | C++ , MATLAB Simulink, Arduino

June 2021

- Spring 2021 Embedded and Real Time Systems course project.
- Developed an embedded system whose job was to control an elevator using MATLAB Simulink.
- Simulated the system on Arduino using the TinkerCAD website to ensure the system's functionality.

AI-bot contest | Python, Keras, BERT models, Scrapy, Selenium, Pandas, Hazm

Feb 2021

- Developed a model able to recognize and answer 4 types of questions (date, time, religious times, and calendar occasions).
- The goal was to create a virtual assistance, but constrained to the mentioned question types. The contest consisted of two parts: Classification and Entity Recognition.
- Different ideas were developed to overcome the difficulty of Persian language NLP.
- Our model achieved 76% accuracy and was ranked 6th among all the participants.

BitTorrent-Python | Python, Threading

Jan 2021

- Fall 2020 Computer Networks course project.
- Developed a BitTorrent-like network and its logic using pure python.

A Twitter-like website | GoLang, MongoDB, React Framework

Jan 2021

- Fall 2020 Internet Engineering course project.
- Built a website similar to Twitter, where I developed the website's backend using GoLang and MongoDB.
- Awarded as the best project in the class.

Social Distancing Detector | Python, OpenCV, Keras

Dec 2020

- Fall 2020 Fundamentals of Computer Vision course project.
- Developed a real-time model able to identify the distance between people walking in open spaces.
- The goal was to eventually build an alerting system to be used in those areas.

Netusage | Python, Linux Socket, Process-Management, Threading

Dec 2020

- A Unix-specific tool capable of monitoring the process-level network traffic usage by tracking the network sockets' activities.

TECHNICAL SKILLS

Programming Languages

Python, Java, C/C++ , GoLang, CUDA, x86 and Arm Assembly, SystemVerilog, Verilog, VHDL, MATLAB

Frameworks/Libraries

Keras, FastAI, Tensorflow 2, OpenCV, Pandas, NumPy, Scikit-Learn, Thrust, Scrapy, Selenium, and Hazm

Tools

MATLAB Simulink, Webots, Modelsim, Keil, Proteus, Jupyter Notebook, JetBrains IDEs, and Microsoft Office

Others

Experienced Linux user, Git, MongoDB, and ARM Cortex-M4 Architecture

VOLUNTEER EXPERIENCE

Member of the SBU AMC Club

May 2019 - Present

- Active AI-related group with 20+ members.
- Contributed to the club in various ways, such as holding knowledge-sharing sessions, teaching, and participating in various online contests with a team (mostly [Kaggle](#)).

Board Member of the Scientific Association of the CES Department of SBU

Nov 2018 - Nov 2021

- The board consisted of 12 members managing the Association and its activities. I held the "Vice President of the Board" title for 2 out of 3 years.
- Did various non-academic university-related activities such as organizing academic events, and helping the students connect to the academic and the industrial scene easier.

HONORS & AWARDS

13th Sharif University of Technology AI Challenge

April 2021

Ranked 3rd in the largest AI Challenge in Iran held online by SUT.

3rd IUST AI Challenge "Chillin Wars" - Senior Section

Sep 2020

Ranked 1st in an online nationwide competition held by IUST.

Various Online Nationwide Data Science Contests

Nov 2019 - Jan 2021

Ranked within the top 1% in each of them. ([Link to Contests](#))

SELECTED COURSES

Embedded and Real Time Systems | 19/20

Spring 2021

Hardware-Software Codesign | 18.6/20

Spring 2021

Fundamentals of Robotics | 19.92/20

Spring 2021

Fundamentals of Cryptography | 18.63/20

Fall 2020

Internet Engineering | 20/20

Fall 2020

Computer Architecture | 18.5/20

Spring 2019

ONLINE COURSES

Introduction to Parallel Programming (CUDA) | [Udacity 458](#)

Jan 2020

Python for Data Science and Machine Learning Bootcamp | [Udemy](#)

Dec 2019

CS224n (Winter 2019) | [Stanford University](#)

Aug 2019

Part 2: Deep Learning from the foundations | [fast.ai](#)

June 2019

Practical Deep Learning for Coders | [fast.ai](#)

July 2019

Deep Learning Specialization | [Andrew NG, Coursera](#)

Jan 2019

LANGUAGES

Persian: Native

English: Fluent (TOEFL iBT exam will be taken on December 11th, 2021)

HOBBIES

Dota 2 - Ranked Divine 1 (top 5% worldwide) • Music (Newbie at Electric Guitar) • Chess • Walking • Foods

REFERENCES

Dr. Dara Rahmati

Computer Science Department

Institute for Research in Fundamental Sciences (IPM)

dara.rahmati@ipm.ir

Dr. Saeid Gorgin

Electrical Engineering and Information Technology Department

Iranian Research Organization for Science and Technology (IROST)

gorgin@ipm.ir