Sobhan Abedi

Tehran, Iran

abedi.sobhan2000@gmail.com

SobhanAbedi

sobhan-abedi-3391402b4

About Me:

I am a curious and diligent learner who enjoys tackling new problems and opportunities.

Ever since my introduction to programming in middle school I've been fascinated with logic, structure, and automation that computers bring to our lives.

I started my B.Eng. in Biomedical Engineering in 2018 at Amirkabir University of Technology (ATU) and entered a dual-degree program in Computer Engineering in 2020. Currently, I'm working on my bachelor's Thesis in the field of Vision Transformer networks.

In 2018 summer, I got my first 3D Printer and Through the past 5 years I've gained ample experience in the fields of mechanics, CAD and register-level programming. Currently I'm designing and building an open-source 3d printer based on Voron Trident. [Read More]

Research Interests

- AI, DNN, [Vision]Transformers
- Embedded Systems
- Hardware Accelerators
- Internet of Things
- Instrumentation
- Distributed Computing
- Video Games

Skills

Programming Languages:

- C, C++, Bash
- ARM/AVR Assembly
- Python
- Java, C#
- HTML, CSS, JavaScript, SQL
- Go

Powerful Frameworks:

- PyTorch
- CUDA, OpenMP
- Arduino
- Hadoop MapReduce, Spark
- SDL, OpenGL

Software Tools:

- Git
- Docker, K8s, Helm
- Postman, Wireshark, Nmap
- JetBrains, MS Visual Studio
- Nvidia CUDA Toolkit
- Intel oneAPI

Education

- **Amirkabir University of Technology (Tehran polytechnic)** Tehran, Iran
  B.Eng. in Computer Engineering Since Sep. 2020
  With focus on Artificial Intelligence and Computer Architecture
  GPA: 18.95/20
  Supervisor: Assoc. Prof. Maryam Amir Mazlaghani [homepage]
  Related Courses:
  - Computer Architecture (20/20)
  - Microprocessor and Assembly Language (20/20)
  - Multicore Programming (19.59/20)
  - Embedded and Real-Time Systems (20/20)
  - Algorithm Design (20/20)
  - Principles & Applications of Artificial Intelligence (17.8/20)
  - Principles of Computational Intelligence (19.2/20)
  - Principles of Cloud Computing (20/20)

- **Amirkabir University of Technology (Tehran polytechnic)** Tehran, Iran
  B.Eng. in Biomedical Engineering Sep. 2018 – Jun. 2023
  With focus on Bioelectrical Engineering (Thesis pending second major)
  GPA: 18.00/20
  Supervisor: Assoc. Prof. Farnaz Ghassemi [homepage]
  Related Courses:
  - Introduction to Biomed Eng (19.2/20)
  - Fun of Radiology & Radiotherapy (18.5/20)
  - Electronics (II) (17.9/20)
  - Fundament of Rehabilitation Inst. (18.2/20)
  - Bioelectrical Phenomena (19.75/20)
  - Electrical Safety in Hospital Systems (19.75/20)
  - Introduction to Biorobotics (19.5/20)
  - Medical Equipment Workshop (19.3/20)

- **Allameh Helli 1 High School (NODET)** Tehran, Iran
  Highschool Diploma in Mathematics and Physics Sep. 2015 – Jun. 2018
  GPA: 19.50/20

Other Software:

- VHDL, Verilog
- MQTT, RabbitMQ
- Unity
- Hadoop HDFS
- FreeNAS, ZFS
- OpenWRT

Engineering Tools:

- Matlab, Simulink
- Xilinx ISE, Vivado
- ModelSim
- Altium, LTspice
- Proteus
- Solidwoks, Fusion 360, Onshape
- PrusaSlicer, Cura, Simplify3D
- Meshmixer, NetFabb

Devices with Experience:

- Raspberry PI
- ARM/AVR Arduino
- CUDA GPU (Pascal, Ampere)
- Xilinx Spartan 3, 6
- Espressif ESP
- RP2040
- TMC Stepper Motor Drivers

Languages

Persian – Native

English – Advanced-Professional
TOEFL iBT score of 105
(R: 27, L: 30, S: 23, W: 25)

Honors and Awards

- Ranked at Top 1% among more than 130,000 participants in National Entrance Exam for Undergraduate State University, Tehran, 2018.
- Educated in Iranian National Organization for Development of Exceptional Talents Secondary and High School (NODET), Tehran, 2010 – 2018
- Part of exceptionally talented students in one of the most prestigious universities in Iran since 2018 and studied in a dual-degree program.

Work and Research Experiences

- **Institute for Research in Fundamental Sciences (IPM)** Tehran, Iran
  Jul. – Sep. 2023
  During this internship, I studied and worked under PD. FELLOW Hajar Falahati in the field of Human Emotion Detection and Efficient Neural Networks. Focusing on CNNs and RNNs mixtures and efficient inference using dual sided sparsity and other methods.

- **Sinamed Robotics and Medical Innovators** Tehran, Iran
  Jul. – Sep. 2022
  SinaMed specializes in robotic surgery equipment. There I worked on the simulation of blood flow during incision in robotic surgeries using Unity Engine and modified Obi Fluid Library and Rope libraries to add required functionalities and Improve performance.

- **Hamrahe Aval (IRMCI) and University of Tehran** Tehran, Iran
  Jun. – Oct. 2021
  We worked on the design of an IOT communications system and fundamental libraries for it based on MQTT and HTTP protocols targeting simple AVR and Espressif microcontrollers. In collaboration with Prof. Modarressi [homepage].

Notable Projects

- **SeaBattle [Read more]**
  A two-player game where players try to sink each other's ships. Implemented in SDL2 both in PvP and PvC modes with a simple CSP agent for setting computer's board and efficient aiming.
- **Mapreduce Presentation [Read more]**
  A presentation for Cloud Computing Course (fall 2023) including Two Examples Implemented in Hadoop MapReduce both in Naive and Semi-optimized ways to showcase different bottlenecks.
- **XV6 Multithreading and Advanced Scheduling [Read more]**
  Adding threads and thread management to XV6 operating system at a higher-level working in a time-sharing manner. In order to manage them multiple scheduling algorithms are realized.
- **Matrix Multiplication [Read more]**
  Realizing multiple implementations of parallel matrix multiplication using **CUDA** kernels and comparing their computation time for a better understanding of SIMD architecture.
- **Word Frequency Histogram [Read more]**
  Using **CUDA** API to generate histogram of the most common words from a given corpora. Including Preprocessing step and capable of Scalable Corpora size and Histogram size.
- **Rollit [Read more]**
  Game of Rollit using pygame library with both PvC and CvC modes where other agents will compete against a single experimental agent whose adversarial behavior is being validated.
- **Frozen Lake [Read more]**
  Solving Frozen Lake model from python gymnasium library in both deterministic and nondeterministic modes using MDP Policy Iteration and Q Learning, and comparing the results.
- **ECG Board with Right Leg Feedback [Read more]**
  Two Lead ECG measurement board simulation and PCB design with active feedback loop connected to right leg for better noise suppression, working with +5v single supply or double.
- **Mailserver [Read more]**
  A Multithreaded mail-server for notifying students of their scores on a school level using Echo V4 library and JWT access tokens with capability of importing large Excel and CSV databases.