Radin **Shayanfar**

Computer Engineering Student

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Research Interests:
Natural Language Processing, Generative Models, Signals and Systems
Theoretical Machine Learning, Computer Vision

Education

Queen's University
Kingston, ON, Canada

Master of Applied Science in Electrical and Computer Engineering — *Sep. 2023 - PRESENT*

- Supervisor: Prof. X. Zhu

Amirkabir University of Technology
Tehran, Iran

Bachelor of Science in Computer Engineering, GPA: **19.45 / 20** — *Sep. 2018 - Apr. 2023*

- Ranked **1st** among 156 students
- **Relevant Coursework** (*PASS courses are due to COVID-19):

Computational Intelligence: 20 / 20	Engineering Statistics: PASS*	Data Structures and Algorithms: 20 / 20
Data Mining: 19.5 / 20	Applied Linear Algebra: PASS*	Operating Systems: 19.4 / 20
Artificial Intelligence: 20 / 20	Information Retrieval: 20 / 20	Programming Languages: 20 / 20
Signals and Systems: 20 / 20	Multimedia Systems: 19.5 / 20	Advanced Programming: 20 / 20
Multicore Programming: 19.8 / 20	Web Programming: 20 / 20	

B.Sc. transcript: https://rshayanfar.ir/transcript.pdf

- Project: **Generating Handwritten Persian Characters with Generative Models**
- Supervisor: Prof. A. Nickabadi

Allame Helli 3 (National Organization for Development of Exceptional Talents) High School
Tehran, Iran

Diploma in Mathematics and Physics, Average: 19.16 / 20 — *2014 - 2018*

Skills

Languages	Python, PHP, Go, Java, HTML, CSS, JavaScript, C, LaTeX, LISP, ML
Web	Laravel, REST API, MySQL, Redis, React, Sass, Flask
DevOps	Docker, Kubernetes
Big Data	Apache Hadoop, Apache Spark, Apache Hive
Other	PyTorch, Keras, OpenCV, CUDA, OpenMP, Arduino, Git, Vim, Linux, Server Administration, Photoshop

Experience

Bale Messenger
Tehran, Iran

Big Data Engineer — *Mar. 2023 - Aug. 2023*

- Managed the continuous data flow in Bale (Banking) Messenger.
- Responsibilities included but not limited to data aggregation, data pipelines building, and data storage infrastructure maintenance and development, using big data tools, like Apache Hive, Spark, and Kafka.

Sharif Data Analytics Lab & National Elites Foundation of Iran
Tehran, Iran

Machine Learning Engineer, Backend Developer — *Dec. 2021 - Sep. 2022*

- Worked on an **Intelligent Voice Commands Recognition** system. Under supervision of Prof. S. A. Motahari.
- My main task was the development of a **speaker verification** system, in which the authentication is done by user's voice. For this purpose, I **trained and evaluated** state-of-the-art ECAPA-TDNN model on Common Voice Persian dataset. The model achieved more than 97% accuracy on a **hand-made dataset** consisting of 8400 pair samples. The experiment results are available on GitHub.
- I was also in charge of design and development of the system's **web API**, which is utilized in the website (rasam-ai.ir). The API exploits a **microservice** architecture and is written in PHP and Python with Laravel and Flask frameworks respectively.

SamCode 5
Tehran, Iran

Programming Contest Scientific Team Member — *Sep. 2020 - Feb. 2021*

- Designed problems and test cases for SamCode, a programming contest for junior high school students.

Ponisha

Tehran, Iran

Freelancer *2020*

- Developed a few Telegram applications using Python and Telegram's TDLib library.

Teaching Experience

Teaching Assistant, Multicore Programming

Amirkabir University of Technology *Spring 2022 & 2023*

- Under supervision of Prof. M. Momtazpour
- Designing theoretical and programming assignments, grading

Teaching Assistant, Computational Intelligence

Amirkabir University of Technology *Spring 2022*

- Under supervision of Prof. M. Ebadzadeh
- Designing programming assignments, giving quizzes, grading

Head Teaching Assistant, Signals and Systems

Amirkabir University of Technology *Fall 2021*

- Under supervision of Prof. M. Rasti
- Designing theoretical and programming assignments, giving quizzes, grading

Teaching Assistant, Data Structures and Algorithms

Amirkabir University of Technology *Fall 2021*

- Under supervision of Prof. E. Nazerfard
- Designing theoretical and programming assignments, grading assignments

Teaching Assistant, Linear Algebra

Amirkabir University of Technology *Spring 2021*

- Under supervision of Prof. M. H. Chehreghani
- Designing programming assignments, grading assignments

Teaching Assistant, Signals and Systems

Amirkabir University of Technology *Spring 2021*

- Under supervision of Dr. A. Aghaeeyan
- Designing theoretical and programming assignments, grading assignments

Projects

Generating Handwritten Persian Characters with Generative Models

Python, Keras, PyTorch, Genrative Models *Feb. 2022 - Apr. 2023*

- Analysis of the recently introduced **generative models** ability to represent and reconstruct individual Persian handwritten characters shape. The models under study are **GAN** and its variations (like **DCGAN** and **WGAN-GP**), **VAE**, **Real NVP** (Normalizing Flows), and **DDPM**.
- A technique was employed to replicate specific people's handwriting based on the given handwriting samples using Real NVP model.
- This was my **BSc. project** under supervision of Prof. A. Nickabadi.

Infromation Retrieval Engine

Python *2022*

- Implementation of an information retrieval system using Python programming language as part of the university's Information Retrieval course. A **positional inverted index** is utilized at the core of the system.
- The engine can respond to queries in two manners; boolean and ranked. The ranked approach uses a **tf-idf** scoring technique to rank the results.

Habco

Laravel, MySQL, Redis, REST API *2021*

- Development of a **REST API** for Habco (a Canadian startup) application, a medical application for patients, doctors, pharmacists, and nurses.
- In habco, patients can choose doctors and nurses. The chosen doctors can write prescriptions for the patient and the nurses can write instructions for them. Patients can also send prescriptions to pharmacies and track its status. There's also a drug stock management panel for pharmacists.
- The API is written in PHP, using **Laravel** framework. It uses **SMS code verification** for authentication.

Music Identification

Python, NumPy, Signals and Systems — *Spring 2021*

- **Design** and development of a music identification and discovery system using **Fast Fourier Transform** (FFT). The system identifies songs using an audio fingerprint based on songs' **spectrogram**, which is calculated from scratch by windowing the signal's time domain and calculating individual FFTs. The fingerprint is obtained in three steps: 1) filtering out very low and very high frequencies, which probably do not represent the song's prominent properties, 2) binning the frequency-domain of the spectrogram, 3) saving frequencies with maximum magnitude in each bin as the representative frequency of each time slice. The fingerprints of signals are compared using a naïve similarity metric.
- Designed and assigned to students as the Signals and Systems course final project by me as the teaching assistant.

SamCode Website

PHP, HTML, CSS, Bootstrap, Sass, JavaScript — *2020*

- Design and development of SamCode programming contest website (Held by Allameh Helli 3 Junior High School).
- The website uses **Datalife Engine (DLE) CMS** and my work involved design and development of a **new template** for the CMS. The template is created by merging a simple landing page with DLE's default template.

Captcha Solver

Python, Keras, OpenCV — *2019 - 2020*

- Practiced solving CAPTCHA images using **image processing** techniques (using **OpenCV**) and **neural networks** (using **Keras**).
- Achieved 96% accuracy on simple 5-letters CAPTCHAs.

RJBot

PHP, MySQL, Telegram Bot API — *2019 - 2020*

- Development of a Telegram bot for searching and downloading media from the RadioJavan.com website, written in PHP.
- The bot supports almost all types of media such as music, video, album, and podcast.
- Developed for the purpose of training **OOP concepts**.

Chaladz Design

Laravel, MySQL — *2019*

- Back-end development of Chaladz Design's online shop, written in Laravel framework.
- The website has admin panel, cart, order tracking, and other regular features of an online shop.

Jpotify

Java, Swing — *2019*

- Development of a graphical music player, written in Java using Swing library for UI design.
- The player has features like playlists and music sharing with friends over network.

Ping-Pong Ball Tracker

C++, OpenCV — *2014*

- Development of a ping-pong game ball tracker using C++ and OpenCV features.

Ticket to Ride

Delphi — *2013*

- Graphical implementation of a 2 players game using Delphi.
- This was the project of Pajooheshi (means "research" in Persian) class in 8th grade.

Online Courses

Generative Adversarial Networks Specialization

DeepLearning.AI — *Spring 2022*

- Build Basic Generative Adversarial Networks (Credential ID: BX8G5BY5Y4DL)
- Build Better Generative Adversarial Networks (Credential ID: KUTVDLKQCM5F)
- Apply Generative Adversarial Networks (Credential ID: 2WJKAHRMERXT)

Game Theory

Stanford University, The University of British Columbia — *Summer 2021*

- Game Theory (Credential ID: ZVWNNHWAJUWC)

Deep Learning Specialization

DeepLearning.AI — *Summer - Fall 2020*

- Neural Networks and Deep Learning (Credential ID: BA53EAM4SJND)
- Improving Deep Neural Networks: Hyperparameter Tuning, Regularization and Optimization (Credential ID: XCAY4CJAU2JA)
- Structuring Machine Learning Projects (Credential ID: PTLC7SEV8RAY)
- Convolutional Neural Networks (Credential ID: CZUV3ZTPK5TA)
- Sequence Models (Credential ID: QA34L8FPDHAY)

Reinforcement Learning

University College London *Summer 2020*

- Introduction to Reinforcement Learning with David Silver (audited only)

Machine Learning

Stanford University *Spring 2020*

- Machine Learning (Credential ID: 2XNJSGPREAQY)

Honors & Awards

2018	**Achieved top 0.3% among all 130,000+ applicants**, Nationwide University Entrance Exam for B.Sc. in Mathematics and Engineering	*Iran*
2014	**3rd place**, Iran Zamin Open Cup (IZOCup) programming contest (held by Salam High School)	*Tehran, Iran*
2011	**Qualified**, National Organization for Development of Exceptional Talents (NODET) schools entrance exam	*Iran*

Languages

Persian Native
English Proficient, TOEFL: 109 / 120 (R: 29, L: 30, S: 21, W: 29)

References

Dr. Xiaodan Zhu, Associate Professor

Department of Electrical and Computer Engineering, Queen's University

- Google Scholar: https://scholar.google.ca/citations?user=a6MYnuUAAAAJ
- Email: xiaodan.zhu@queensu.ca

Dr. Seyed Abolfazl Motahari, Assistant Professor

Computer Engineering Department, Sharif University of Technology

- Google Scholar: https://scholar.google.com/citations?user=rJ-biB0AAAAJ
- Email: motahari@sharif.edu

Dr. Ahmad Nickabadi, Assistant Professor

Computer Engineering Department, Amirkabir University of Technology

- Google Scholar: https://scholar.google.com/citations?user=pSMNSZwAAAAJ
- Email: nickabadi@aut.ac.ir

Dr. Mehdi Rasti, Associate Professor

Information Technology and Electrical Engineering Department, University of Oulu

- Google Scholar: https://scholar.google.com/citations?user=zb8pjMYAAAAJ
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Dr. Mohammad Mehdi Ebadzadeh, Professor

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Dr. Mostafa H. Chehreghani, Assistant Professor

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Dr. Mahmoud Momtazpour, Assistant Professor

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