

# Haleh Damirchi

+98 914 912 2513 | haledamirchi@gmail.com | LinkedIn | Github

## Education

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### Amirkabir University of Technology

*M.Sc. Electrical Engineering, GPA: 17.83/20*

Tehran, Iran

2017–2020

Thesis: Single-channel Speaker Extraction based on Deep Learning

### Tabriz University

*B.Sc. Electrical Engineering, GPA: 16.04/20*

Tabriz, Iran

2012–2016

## Research Interests

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Deep learning, Reinforcement learning, Signal processing, Image and Speech processing

Machine learning applications in healthcare, Medical signal processing, Neuroscience

## Publications

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- [1] **H. Damirchi**, S. Seyedin, S. M. Ahadi, “Speaker Extraction using Stacked BLSTM Optimized with Frequency-domain Differentiated Spectrum Loss,” in *International Conference on Electrical Engineering (ICEE). IEEE, 2020*. (to appear)
- [2] **H. Damirchi**, S. Seyedin, S. M. Ahadi, “Improving the Loss Function Efficiency for Speaker Extraction Using Psychoacoustic Effects,” Submitted to *Applied Acoustics, 2020*.

## Work Experience

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### Machine Learning Teaching Assistant

*Amirkabir University of Technology*

Fall 2019 – Present

*Graduate/Undergraduate*

### Logic Circuits Teaching Assistant

*Amirkabir University of Technology*

Spring 2019, Spring 2020

*Undergraduate*

### Research Assistant at Signal and Speech Processing Research Lab

*Amirkabir University of Technology*

2019 – Present

### R&D Intern

*Aria Kavosh Industrial Corp.*

July 2016 – Feb 2017

### Tech Blogger

*Graph Team - ZAMANA blog*

Aug 2015 – June 2016

### R&D Intern

*Tabriz Peguh*

Summer 2014

## Honors

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- **Second Best** teaching assistant in the electrical engineering faculty of Amirkabir University of Technology by students' evaluations.
- Ranked among **top 1%** in the nationwide university entrance exam in Mathematics and Physics field for B.Sc. degree, 2012.
- Ranked among **top 1%** in the nationwide university entrance exam in Electrical Engineering field for M.Sc. degree, 2017.

## Extra Courses and Certificates

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| <b>Fundamentals of Reinforcement Learning</b><br><i>Coursera</i>   | July 2020    |
| <b>Fundamentals of Neuroscience (part one)</b><br><i>edX</i>   | April 2020   |
| <b>Deep Learning Specialization</b><br><i>Coursera</i>   | March 2018   |
| <b>Certificate of Robotic Training and Participation</b><br><i>Robotic Competition, University of Tabriz</i> | January 2013 |

## Projects

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### **Speaker Extraction** | *Tensorflow, Pytorch, Matlab*

- Worked on deep neural networks (DNN, LSTM, CNN) for speaker extraction.
- Researched for and implemented different loss functions for DNN and LSTM models.

### **Speech Recognition** | *Matlab*

- Used Hidden Markov Models (HMM) and Dynamic Time Warping (DTW) to recognize an utterance.

### **Speech Enhancement** | *Matlab, Python*

- Enhanced the input noisy speech using MMSE and Spectral Subtraction algorithm
- Used Decision Directed algorithm to estimate the prior SNR.

### **Voice Activity Detection** | *Matlab, Python*

- Used Ramirez04 Algorithm to detect the activity of speech signals.

### **Packet Transmission in Wireless Sensor Networks** | *Python*

- Optimized Packet Sending using ACO (Ant Colony Optimization) algorithm.

### **Backpropagation using Evolutionary Algorithms** | *Python*

- Implemented backpropagation in a deep neural network using GWO (Gray Wolf Optimization), and PSO (Particle Swarm Optimizaton).

### **Path Planning through Obstacles** | *Python*

- Implemented genetic algorithm to optimize path planning through obstacles.

### **Flight Trend Prediction** | *Python, Tensorflow*

- Predicted number of flights based on trends and data given by Alibaba company (Amirkabir University Data Analysis Competetion).

### **Car Price Prediction** | *Python*

- Extracted car data from Bama car dealership website using BeautifulSoup python library.
- Predicted the price of cars using machine learning algorithms from sklearn python library.

## Technical Skills

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C, Python, Tensorflow, Keras, Pytorch, Matlab, Latex, MySQL  
AVR, PCB Design, PLC Ladder

## Languages

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- Azeri, Persian: Native
- English: Fluent, TOEFL iBT: 114 (Reading: 30, Listening: 30, Speaking: 27, Writing: 27)

## volunteer work

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Organizing committee member in 4<sup>th</sup> International Conference on Signal Processing and Intelligent Systems (ICSPIS), December 2018 at Amirkabir University of Technology, Tehran, Iran.