Arya Aftab

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EDUCATION

Sharif University of Technology **Sep. 2018 – Jul. 2021**
Master of Science, *Department of Electrical Engineering (Communication Systems)* *Tehran, Iran*
Thesis: "Speech Emotion Recognition with Deep Learning and Frequency Features"
Supervisor: Prof. Shahrokh Ghaemmaghami
GPA : 3.6 (16.42 / 20)

Amirkabir University of Technology (Tehran Polytechnic) **Sep. 2013 – Aug. 2018**
Bachelor of Science, *Department of Biomedical Engineering (Bioelectric)* *Tehran, Iran*
Thesis: "Investigating Effect of Drop-out Regularizer on Deep Neural Network"
Supervisor: Dr. Seyyed Ali Seyyedsalehi

RESEARCH INTERESTS

- Deep Learning
- Machine Learning
- Meta Learning
- Artificial Intelligence
- Speech Processing
- Tiny Machine Learning

RELEVANT COURSEWORK

- Deep Learning
- Information Hiding
- Speech Processing
- Random Processes
- Advanced Communication
- Source Localization
- Radar Systems
- Artificial Intelligence
- Chaos Theory
- Optimization
- Linear Algebra

HONORS

- Ranked $\mathbf{9}^{th}$ among more than 3,500 students in nation-wide university entrance exam (Konkoor) for M.Sc. degree in Electrical Engineering [Spring 2018].
- Ranked within top **0.05%** among more than 250,000 students in nation-wide university entrance exam (Konkoor) for B.Sc. degree. [Summer 2013].
- Acceptance in the first stage of Iran's nation-wide astronomy Olympiad (among top 2000 of 100,000 participants) [Winter 2011].

PUBLICATIONS

- **Arya Aftab**, Alireza Morsali, Shahrokh Ghaemmaghami, Benoit Champagne. "**Light-SERNet: A Lightweight Fully Convolutional Neural Network for Speech Emotion Recognition**". Accepted in ICASSP 2022. Arxiv
- **Arya Aftab**, Alireza Morsali, Shahrokh Ghaemmaghami. "**Multi-Head ReLU Implicit Neural Representation Networks**". Accepted in ICASSP 2022. Arxiv
- Fatemeh Kashani, **Arya Aftab**, Shahrokh Ghaemmaghami, Afra Hadjizadeh. "**A Machine Learning Framework for Predicting Entrapment Efficiency in Niosomal Particles**". Under submission.
- **Arya Aftab**, Fatemeh Kashani, Alireza Morsali, Shahrokh Ghaemmaghami. "**An End to End Method for Predicting pK_a of Small Molecules**". Under preparation.

PROJECTS

Different Models for Word Spotting (Private Repository) | Python, TensorFlow, PyTorch **Present**

- In this project, for an industrial project at Electronic Research Institute (ERI), we examine several different models in terms of efficiency, accuracy, ability to implementation, and so on.

A ML Framework for Predicting EE in Niosomal Particles | Python, TensorFlow **Apr. 2022**

- In this project, several machine learning models were implemented in the form of a TensorFlow-based framework to predict drug entrapment efficiency (EE) in niosomal particles. Drug entrapment efficiency along with niosomal particle size are the most important features of these drug delivery systems. The results of this project are being submitted in the form of an article.

Multi-Head ReLU for Implicit Neural Representation | Python, TensorFlow **Sep. 2021**

- In this project, a novel multi-head multi-layer perceptron (MLP) structure is presented for implicit neural representation (INR).

Speech Emotion Recognition (My Master's Thesis) | Python, TensorFlow, Linux **Jul. 2021**

- In this project, we propose an efficient and lightweight fully convolutional neural network(FCNN) for speech emotion recognition in systems with limited hardware resources.

Drop-Connect in TensorFlow | Python, TensorFlow **Jul. 2021**

- In this project, we implemented drop-connect in form of a Python library.

SincNet in TensorFlow | Python, TensorFlow **Jun. 2021**

- In this project, we implemented SincNet in form of a Python library.

Rotary Embeddings in TensorFlow | Python, TensorFlow **May. 2021**

- In this project, a standalone library for adding rotary embeddings to transformers in TensorFlow was implemented.

Sparse Layer in TensorFlow | Python, TensorFlow **Apr. 2021**

- In this project, we implemented two layers(Convolution and Dense) as sparse layers in form of a Python library.

Physics-Based Neural Network | Python, TensorFlow, FEniCS **Feb. 2021**

- In this project, we used the sine activation function, which has recently been introduced as a solution for solving differential equations with neural networks.

Two Steps Gradient Vector Flow (GVF) Snake Model | MATLAB **Dec. 2020**

- In this project, we utilized the generalized gradient vector flow snake model using minimal surface and two steps converging using both vector based normalization and component-based normalization with distinct controlling parameters on active contour.

Stock Prediction (Private Repository) | Python, TensorFlow, Web Crawling **Sep. 2020**

- In this project, we first extracted financial market data via web crawling and then modelled them for risk reduction and profit forecasting.

TEACHING EXPERIENCES

Teaching Assistant: Speech Processing **Sep. 2020 – Jan. 2021**

- For PhD and Master students of electrical engineering (communication systems) at Sharif University of Technology. Supervision: **Prof. Shahrokh Ghaemmaghami**.

Teaching Assistant: Fundamental of Electrical Engineering **Feb. 2020 – Jun 2020**

- For Bachelor students of electrical engineering at Sharif University of Technology. Supervision: **Dr. Leila Mahmodi**.

TECHNICAL SKILLS

Programming Languages:

- **Python**(TensorFlow, PyTorch, Keras, JAX)(Expert)
- **MATLAB**(Expert)
- **C++**(Intermediate)
- **JavaScript**(Intermediate)
- **BashScript**(Intermediate)

Developer Tools:

- **VS Code**(Expert)
- **Jupyter Notebook**(Expert)
- **PyCharm**(Intermediate)
- **Sublime Text**(Intermediate)
- **Vim**(Intermediate)

Technologies/Frameworks:

- **Linux**(Expert)
- **GitHub**(Expert)
- **Git**(Expert)
- **NodeJS**(Intermediate)
- **Docker**(Intermediate)

General Softwares:

- **LaTeX**(Intermediate)
- **GIMP**(Intermediate)
- **Inkscape**(Intermediate)
- **MeshLab**(Intermediate)
- **Mendeley**(Intermediate)
- **Microsoft Office**(Intermediate)

WORK EXPERIENCES

Electronic Research Institute (ERI) at Sharif University of Technology **Sep. 2021 – Present**
Researcher *Tehran, Iran*

- I am working as a researcher and developer to develop systems based on machine learning and speech processing. Major tasks include building a valid database, implementing the latest published models and algorithms, improving existing algorithms, and using models and algorithms in the real world.

Orouna **Sep. 2020 – Present**
Head of AI *Tehran, Iran*

- At Orouna, I work as the head of its artificial intelligence department. My colleagues and I pay special attention to the implementation of deep learning algorithms on hardwares with limited computing resources such as Raspberry Pi.

DG Sculptor **Jan. 2021 – Present**
Researcher *Montreal, Canada*

- My colleagues and I at this startup are trying to develop new methods for neural rendering. We reported the results of our research as open-source and authoritative articles.

Arya Teb Firouz **Mar. 2019 – Aug. 2019**
Researcher *Tehran, Iran*

- I worked as a researcher in the research and development (R&D) department of the company to solve problems with artificial intelligence.

INTERNSHIP

Emam Sajjad Hospital **Jun. 2017 – Aug. 2017**
Biomedical Intern *Yasuj, Iran*

- I classified documents related to medical devices in the hospital based on their performance.

INTERESTS

- Listening to Music
- Watching Movies
- Playing Computer Games
- Walking
- Climbing
- Reading Manga Comics

LANGUAGE PROFICIENCY

- **Persian:** Native
- **English:** Studying for IELTS

REFERENCES

- **Prof. Shahrokh Ghaemmaghami**: Full Professor
  Department of Electrical Engineering and Electronics Research Institute, Sharif University of Technology, Tehran, Iran.
  Email: ghaemmag@sharif.edu
- **Dr. Sajjad Amini**: Assistant Professor
  Department of Electrical Engineering and Electronics Research Institute, Sharif University of Technology, Tehran, Iran.
  Email: s_amini@sharif.edu
- **Dr. Alireza Morsali**: Researcher
  Department of Electrical and Computer Engineering, McGill University, Montreal, Canada.
  Email: alireza.morsali@mail.mcgill.ca