Mohsen Fayyaz

Personal Data

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Education

Sep. 2021 – Sep. 2017 — **B.Sc. Student in Computer Engineering**
School of Electrical and Computer Engineering, University of Tehran, Tehran, Iran
Last Year's GPA: **19.47/20 (4.0/4.0)**
Total GPA: **19.08/20**
(Ranked 3^{rd} among 103 Computer Engineering students)

Relevant Course Works:

- Artificial Intelligence (20/20), Advanced Programming (20/20), Design and Analysis of Algorithm (20/20), Computer Networks (20/20), Data Structure (19.7/20), Database Systems (20/20), The Theory of Formal Languages and Automata (20/20), Programming Languages and Compilers (20/20), Operating Systems (19/20), Internet Engineering (20/20), Engineering Mathematics (20/20), Digital Logic Design (20/20)

Jun. 2017 – Sep. 2014 — **Diploma in Mathematics and Physics Discipline**
National Organization for Development of Exceptional Talents, Tehran, Iran
GPA: 19.68/20

Research Interests

- Natural Language Processing
- Computer Vision
- Deep Learning
- Artificial intelligence

Publications

- "Not All Models Localize Linguistic Knowledge in the Same Place: A Layer-wise Probing on BERToids' Representations" [paper] [code] [blog]
  Mohsen Fayyaz, Ehsan Aghazadeh, Ali Modarressi, Hosein Mohebbi and Mohammad Taher Pilehvar
  In Proceedings of the Fourth BlackboxNLP Workshop on Analyzing and Interpreting Neural Networks for NLP, 2021 collocated with **EMNLP 2021**

Research Experience

Fall 2021 | **Metaphors in Pre-trained Language Models**
Under supervision of Prof. Yadollah Yaghoobzadeh
This research aimed to investigate probing, generalization and application of metaphorical knowledge in pre-trained language models

Summer 2021 | **Layer-wise Probing BERToids' Representations**
Under supervision of Prof. Mohammad Taher Pilehvar
Through probing and measurement tools, we demonstrated that BERT's derivative models, especially those with different objectives and structural choices, express different behaviors in their representations.

Spring 2021 | **Investigating Toxicity Detection Knowledge in Contextual Language Models**
Under supervision of Prof. Azadeh Shakery
In this study, we intended to analyze the knowledge of different contextual language models in toxicity detection. We showed their interesting ability gained in pre-training as well as possible biases towards specific persons or groups through self-attention analysis.

Summer 2020 | **NLP Research Intern at TeIAS, Tehran, Iran**
Under supervision of Prof. Mohammad Taher Pilehvar
The aim of this study group was to lay the foundations for carrying out research. This included studying the basics of NLP and Machine Learning (mostly Deep Learning), reading papers, and discussing ideas. Initiated a website for tracking NLP datasets in Farsi.
Keywords: BERT, LSTM, GRU, Attention Model, Transformer, Word2Vec, Sentiment Analysis, Named Entity Recognition, Language Translation

Honours and Awards

2021 | **Enrolled in the graduate school as a top student**
Enrolled in the graduate school as a top student without passing the entrance examinations, University of Tehran

2020 | **F.O.E (Faculty of Engineering) Award**
Ranked 1^{st} among all of 103 Computer Engineering students, University of Tehran

2019 | **F.O.E (Faculty of Engineering) Award**
Ranked 3^{rd} among all of 103 Computer Engineering students, University of Tehran

2017 | **University of Tehran Scholarship**
Received scholarship from the University of Tehran Sponsors Foundation as an exceptional talent

2017 | **Ranked in top 0.4% in Konkur Exam(National University Entrance Exam)**
Ranked in top 0.4 percent of all 148,429 participants in Iran

2015 | **Second place in Khwarizmi Youth Award**
An important national research award given annually by the President of Iran.

Work Experience

Summer 2018 | **Software Engineer at Sarir Computer Company, Tehran, Iran**
Developed front and back-end web applications, android applications, and VOD streaming tools to be used in production
Tools and Technologies: React Native, PHP, Javascript, Ajax, CSS, FFmpeg, HLS

Teaching Experience

Fall 2021 Fall 2020	**TA, Artificial Intelligence, Prof. Yaghoobzadeh, Dr. Fadaei** University of Tehran, Tehran, Iran
Fall 2020 Fall 2019	**Head TA, Formal Languages and Automata Theory, Prof. Hojjat** University of Tehran, Tehran, Iran
Fall 2020 Fall 2019	**TA, Advanced Programming, Prof. Khosravi** University of Tehran, Tehran, Iran
Spring 2019	**TA, Digital Logic Design, Prof. Navabi** University of Tehran, Tehran, Iran

Professional Development

The following online courses were taken to acquire skills relevant to my research:

- Build Basic Generative Adversarial Networks (GANs), Coursera.org, Credential
- Deep Learning Specialization, Coursera.org, Credential
- Sequence Models, Coursera.org, Credential
- Convolutional Neural Networks, Coursera.org, Credential
- Structuring Machine Learning Projects, Coursera.org, Credential
- Improving Deep Neural Networks: Coursera.org, Credential
- Neural Networks and Deep Learning, Coursera.org, Credential

Notable Projects

Summer 2020	**Colorizing Grayscale Images by Modifying Pretrained Inception Network** Modified an inception model and trained it on 10K images to colorize grayscale images. As for color space, I used CIELAB to separate lightness as input and a* and b* as outputs of the convolutional neural network. Results available on github **Tools and Technologies:** Tensorflow, Keras, Python, CNN, Transfer Learning
Spring 2020	**Online Real-time Propeller LED Display** Embedded Systems Final Course Project Introduction video available at: https://www.youtube.com/watch?v=wf1WOrsO_tA **Tools and Technologies:** video-processing-on-Android, C++, Java, network-programming
Summer 2019	**Noisy GPS Sample Generator** Summer of Code Project, Collaborating with Balad, Under Supervision of Prof. Bahrak Generating noisy GPS points on a route between two points for evaluating map-matching algorithms, using Java and GraphHopper routing engine
Spring 2019	**TOORLA Programming Language Compiler** Programming Languages and Compilers Course Project A modular programming language compiler, using Antlr4 and Java.
Fall 2018	**Online Electrical Circuits Nodal Analysis** Electrical Circuit Course Project Electrical circuits analyzer, supporting voltage and current sources and resistor modules.

Skills and Qualities

Programming	Python (Good Knowledge, Familiar With PyTorch, NumPy, Pandas, Tensorflow), C++, Java, Java-script, SQL, Verilog HDL, PHP, HTML, CSS
Tools and Frameworks	PyTorch, Keras, Tensorflow, Transformers, Git, React-Native, Android Studio, LaTeX
Personal Qualities	Diligent, organized, experienced in team-working, curious for new ideas, fast learner, and open to new opportunities.

Languages

Persian	Native
English	Fluent (TOEFL score: **114/120**, Reading: 29, Listening: 30, Speaking: 27, Writing: 28)

References

Available upon request