Mohsen Fayyaz

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Education

School of Electrical and Computer Engineering, University of Tehran — *Tehran, Iran*

Masters in Artificial Intelligence, Computer Engineering — *Sep. 2021 - Present*

- Total GPA: **20/20**
- Relevant Course Works:
  - Machine Learning (20/20)
  - Statistical Inference (20/20)

School of Electrical and Computer Engineering, University of Tehran — *Tehran, Iran*

B.Sc. in Computer Engineering — *Sep. 2017 - Sep. 2021*

- 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), Parallel Programming (19.2/20), Data Structure (19.7/20), Database Systems (20/20), Programming Languages and Compilers (20/20), Operating Systems (19/20), Internet Engineering (20/20), Engineering Mathematics (20/20)

National Organization for Development of Exceptional Talents — *Tehran, Iran*

Diploma in Mathematics and Physics Discipline — *Sep. 2014 - Jun. 2017*

- GPA: 19.68/20

Research Interests

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

Publications

GlobEnc: Quantifying Global Token Attribution by Incorporating the Whole Encoder Layer in Transformers — *NAACL 2022*

- Ali Modarressi*, **Mohsen Fayyaz***, Yadollah Yaghoobzadeh and Mohammad Taher Pilehvar
- (* equal contribution)

Metaphors in Pre-Trained Language Models: Probing and Generalization Across Datasets and Languages [paper] [code] [video] — *ACL 2022*

- Ehsan Aghazadeh*, **Mohsen Fayyaz*** and Yadollah Yaghoobzadeh
- (* equal contribution)

Not All Models Localize Linguistic Knowledge in the Same Place: A Layer-wise Probing on BERToids' Representations [paper] [code] [blog] — *BlackboxNLP @ EMNLP 2021*

- **Mohsen Fayyaz***, Ehsan Aghazadeh*, Ali Modarressi, Hosein Mohebbi and Mohammad Taher Pilehvar
- (* equal contribution)

Research Experience

Metaphors in Pre-trained Language Models

Under supervision of Prof. Yadollah Yaghoobzadeh — *Fall 2021*

- This research aimed to investigate probing, generalization and application of metaphorical knowledge in pre-trained language models

Layer-wise Probing BERToids' Representations

Under supervision of Prof. Mohammad Taher Pilehvar — *Summer 2021*

- 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.

Investigating Toxicity Detection Knowledge in Contextual Language Models

Under supervision of Prof. Azadeh Shakery — *Spring 2021*

- 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.

NLP Research Intern at TeIAS, Tehran, Iran

Under supervision of Prof. Mohammad Taher Pilehvar — *Summer 2020*

- 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.

Work Experience

Tapsell Company — *Tehran, Iran*

Machine Learning Engineer — *Sep. 2021 - Present*

- Developed NLP engines for representing the users more accurately and enhance targeted advertising.

Honors & 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	*University of Tehran*
2017	**Ranked in top 0.4% in Konkur Exam**, Ranked in top 0.4 percent of all 148,429 participants in Iran	*Iran*
2015	**Second place in Khwarizmi Youth Award**, An important national research award given annually by the President of Iran.	*Iran*

Teaching

Teaching Assistantship

2020-2022	**Artificial Intelligence**, Prof. Yaghoobzadeh, Dr. Fadaei	*University of Tehran*
2019-2020	**Formal Languages and Automata Theory**, Prof. Hojjat	*University of Tehran*
2019-2020	**Advanced Programming**, Prof. Khosravi	*University of Tehran*
2019	**Digital Logic Design**, Prof. Navabi	*University of Tehran*

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

Skills

Programming	Python (PyTorch, sklearn, 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
Languages	• Persian: Native • English: Fluent (TOEFL score: **114/120**, Reading: 29, Listening: 30, Speaking: 27, Writing: 28)

Notable Projects

Semantic Matching of Queries to Ads — *Summer 2021*

- Building proper embeddings for queries and ads to achieve fast prediction of sponsored search advertising using their proximity in the same representation space. [repository]

Colorizing Grayscale Images Using Inception Network

Summer 2020

- 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. [repository]

Online Real-time Propeller LED Display

Spring 2020

- Embedded Systems Final Course Project. https://www.youtube.com/watch?v=wf1WOrsO_tA

References

Mohammad Taher Pilehvar, mp792@cam.ac.uk — *TeIAS*

Yadollah Yaghoobzadeh, y.yaghoobzadeh@ut.ac.ir — *University of Tehran*

Hossein Hojjat, hojjat@ut.ac.ir — *University of Tehran*