

# Mohsen Fayyaz

RESEARCH ASSISTANT · UNIVERSITY OF TEHRAN

Department of Electrical and Computer Engineering, Faculty of Engineering, University of Tehran, Iran

✉ mohsen.fayyaz77@gmail.com | 🏠 mohsenfayyaz.github.io | 📧 mohsenfayyaz | 🌐 mohsenfayyaz | 🎓 Mohsen Fayyaz

## 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 (4/4)**
- Relevant Course Works:
  - Natural Language Processing (20/20)
  - Machine Learning (20/20)
  - Neural Networks (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<sup>rd</sup>** 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), Programming Languages and Compilers (20/20), Operating Systems (19/20)

### 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
- Deep Learning

## Publications

### GlobEnc: Quantifying Global Token Attribution by Incorporating the Whole Encoder Layer in Transformers [paper] [code] [video]

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

### Remote Research Assistant at École de technologie supérieure

Montreal, Canada

UNDER SUPERVISION OF PROF. SAMIRA EBRAHIMI AND PROF. YADOLLAH YAGHOOBZADEH

Spring 2022 - Present

- BERT on a data diet: Finding important examples by gradient-based pruning

### Research Assistant at University of Tehran

Tehran, Iran

UNDER SUPERVISION OF PROF. YADOLLAH YAGHOOBZADEH AND PROF. MOHAMMAD TAHER PILEHVAR

Fall 2021 - Present

- Quantifying global token attribution by incorporating the whole encoder layer in Transformers. (NAACL 2022)
- Metaphors in pre-trained language models: Probing and generalization across datasets and languages. (ACL 2022)

## NLP Research Intern at Tehran Institute for Advanced Studies (TeIAS)

UNDER SUPERVISION OF PROF. MOHAMMAD TAHER PILEHVAR

- Layer-wise probing on BERT, XLNet, and ELECTRA representations for linguistic knowledge. (BlackboxNLP @ EMNLP2021)

Tehran, Iran

Summer 2021

## Undergraduate Research Assistant at University of Tehran

UNDER SUPERVISION OF PROF. AZADEH SHAKERY

- Investigating toxicity detection knowledge in contextual language models and possible biases.

Tehran, Iran

Spring 2021

## Member of NLP Study Group

UNDER SUPERVISION OF PROF. MOHAMMAD TAHER PILEHVAR

- Tasks including image captioning, sentiment analysis, machine translation, NER, and reading papers to lay the foundations for carrying out research. Initiated nlpdataset.ir for tracking NLP datasets in Farsi.

Tehran, Iran

Summer 2020

## Work Experience

### Data Scientist

SOTOON

- Developed AutoML services including various ML tasks and models.

Tehran, Iran

Jul. 2022 - Present

### Machine Learning Engineer

TAPSELL

- Developed NLP engines and ML models for enhancing targeted advertising.

Tehran, Iran

Sep. 2021 - Jul. 2022

## Honors & Awards

2021	<b>Enrolled in the graduate school as a top student</b> , Enrolled in the graduate school as a top student without passing the entrance examinations	University of Tehran
2020	<b>F.O.E (Faculty of Engineering) Award</b> , Ranked 1 <sup>st</sup> among all of 103 Computer Engineering students	University of Tehran
2019	<b>F.O.E (Faculty of Engineering) Award</b> , Ranked 3 <sup>rd</sup> among all of 103 Computer Engineering students	University of Tehran
2017	<b>University of Tehran Scholarship</b> , Received scholarship from the University of Tehran Sponsors Foundation as an exceptional talent	University of Tehran
2017	<b>Ranked in top 0.4% in Konkur Exam</b> , Ranked in top 0.4 percent of all 148,429 participants in Iran	Iran
2015	<b>Second place in Khwarizmi Youth Award</b> , An important national research award given annually by the President of Iran.	Iran

## Teaching

### TEACHING ASSISTANTSHIP

2020-2022	<b>Artificial Intelligence</b> , Prof. Yaghoobzadeh, Dr. Fadaei	University of Tehran
2019-2020	<b>Formal Languages and Automata Theory</b> , Prof. Hojjat	University of Tehran
2019-2020	<b>Advanced Programming</b> , Prof. Khosravi	University of Tehran
2019	<b>Digital Logic Design</b> , 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 - Feb 2021 - Credential
- Deep Learning Specialization, Coursera.org - Sep 2020 - Credential
- Sequence Models, Coursera.org - Sep 2020 - Credential
- Convolutional Neural Networks, Coursera.org - Aug 2020 - Credential
- Structuring Machine Learning Projects, Coursera.org - Aug 2020 - Credential
- Improving Deep Neural Networks: Coursera.org - Aug 2020 - Credential
- Neural Networks and Deep Learning, Coursera.org - Aug 2020 - Credential

## Skills

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<b>Programming</b>	Python (PyTorch, sklearn, NumPy, Pandas, Tensorflow), C++, Java, Java-script, SQL, Verilog HDL, PHP, HTML, CSS
<b>Tools and Frameworks</b>	PyTorch, Keras, Tensorflow, HuggingFace, Transformers, Git, React-Native, Android Studio
<b>Languages</b>	<ul style="list-style-type: none"><li>• Persian: Native</li><li>• English: Fluent (TOEFL score: <b>114/120</b>, Reading: 29, Listening: 30, Speaking: 27, Writing: 28)</li></ul>

## Notable Projects

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### Natural Language Processing Course Assignments @ University of Tehran

Winter 2022

- Including Tokenization, Naive Bayes, RNN, LSTM, Transformers, Machine Translation, QA and NLU. (Pytorch)

### Neural Networks Course Assignments @ University of Tehran

Winter 2022

- Including CNN, RNN, GAN and RL. (Pytorch, Tensorflow)

### 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](https://www.youtube.com/watch?v=wf1WOrsO_tA)

## References

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**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