

# Mohsen Fayyaz

RESEARCH ASSISTANT · UNIVERSITY OF TEHRAN

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## Education

### School of Electrical and Computer Engineering, University of Tehran

Tehran, Iran

MASTER'S 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)

Tehran, Iran

UNDER SUPERVISION OF PROF. MOHAMMAD TAHER PILEHVAR

Summer 2021

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

## Undergraduate Research Assistant at University of Tehran

Tehran, Iran

UNDER SUPERVISION OF PROF. AZADEH SHAKERY

Spring 2021

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

## Member of NLP Study Group

Tehran, Iran

UNDER SUPERVISION OF PROF. MOHAMMAD TAHER PILEHVAR

Summer 2020

- 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.

## Work Experience

### Data Scientist

Tehran, Iran

SOTOON

Jul. 2022 - Present

- Developed AutoML services including various ML tasks and models.

### Machine Learning Engineer

Tehran, Iran

TAPSELL

Sep. 2021 - Jul. 2022

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

## 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

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