

SARA RAJAEI

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Sara-Rajaei

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Education

IUST • Iran University of Science and Technology

Tehran, Iran : 2019 - present

M.Sc. IN COMPUTER ENGINEERING MAJOR : ARTIFICIAL INTELLIGENCE

GPA: 18.39 / 20, 4 / 4

- Supervised by Prof. Mohammad Taher Pilehvar and co-supervised by Prof. Behrouz Minaei
- Thesis: Analyzing the geometry of embedding space in transformer-based models

IUST • Iran University of Science and Technology

Tehran, Iran : 2014 - 2019

B.Sc. IN COMPUTER ENGINEERING MAJOR : COMPUTER NETWORKING

GPA: 14.23 / 20, 2.53 / 4

- Supervised by Prof. Vesal Hakami
- Thesis: Optimizing Content Placement in Cache-enabled Small Base Stations: A Game Theoretic Multi-agent Learning Approach

Research Interests

- Natural Language Processing
- Interpretability of deep models
- Representation Learning

Publications

- Sara Rajaei**, and Mohammad Taher Pilehvar. "How Does Fine-tuning Affect the Geometry of Embedding Space: A Case Study on Isotropy." Accepted in the 2021 Conference on Empirical Methods in Natural Language Processing (EMNLP 2021). (*Findings*) [pdf]
- Sara Rajaei**, and Mohammad Taher Pilehvar. "A Cluster-based Approach for improving Isotropy in Contextual Embedding Space." Accepted in the 59th Annual Meeting of the Association for Computational Linguistics and the 11th International Joint Conference on Natural Language Processing (ACL-IJCNLP 2021). (*Oral presentation*) [pdf]
- Zahra Rashidi, Vesal Hakami, Parmida Granmayeh, **Sara Rajaei**. "A Multi-Agent Learning Approach to Content Placement in Cache-Enabled Small Cell Networks with Incomplete Information."
– Under review

Research Experience

Graduate Research Assistance :

NLP Lab, IUST

Sep 2019 - present

- Working on the encoded linguistic knowledge in contextual representations
- Analyzing the geometry of contextual embedding space
- Supervised by Prof. Mohammad Taher Pilehvar

Research Assistance :

Institute for Research in Fundamental Sciences (IPM)

Jun - Jul 2021

- Worked on the robustness of contextualized pre-trained models

Undergraduate Research Assistant :

Computer Networks Lab, IUST

Jul 2019 - April 2020

- Worked on optimization caching in small base stations in cellular networks based on a potential game and reinforcement learning

Undergraduate Research Assistant :

Information Technology Lab, IUST

Oct 2015 - Feb 2017

- Worked on developing a testbed for Computational offloading in Mobile Cloud Computing

Teaching Experience

Head Teaching Assistant :

IUST

Sep 2021 - present

- Natural Language Processing (Instructor: Dr. Minaei)

Teaching Assistant :

Neuromatch academy Deep Learning (NMA-DL) summer school

Aug 2021

- Mentored 7 groups on several Deep Reinforcement Learning projects

Graduate Teaching Assistant :

IUST

Feb - Jul 2021

- Deep learning (Instructor: Dr. Mohammadi)
- Game theory (Instructor: Dr. Hakami)
- Advanced topics in data mining (Instructor: Dr. Minaei)

Head Teaching Assistant :

IUST

Sep 2020 - Feb 2021

- Neural Networks (Instructor: Dr. Mozayani)
- Natural Language Processing (Instructor: Dr. Minaei)

Industrial Experience

Full stack developer :

Amid Rayaneh Sharif Co. (ARSH)

Jul 2018 - Oct 2018

- SIMAP project developer (The biggest research information management system of faculty members in Iran used in prestigious universities, research institutes, and scientific and research centers)

Student Internship :

Arya Hamrah Samaneh Co. (AHS)

Jun - Sep 2017

- Worked on Cloud Computing Services

Selected projects

A Cluster-based Isotropy Enhancement Method in Contextual Embedding Space

Summer 2020

- Selected as the featured project in Deep Learning course.
- Proposing a novel approach to improve contextual embedding space isotropy.
- A comprehensive analysis on the structure of contextual embedding space and biases.
- The code and analyses will be available on my GitHub after publishing the paper.

Transfer Learning in NLP

Spring 2020

- A Deep Study in Transfer Learning Based on "Parameter-Efficient Transfer Learning for NLP".
- Re-implementing the approach introduced in Houlsby et al. (2019).
- We proposed and implemented two extensions to Houlsby's architecture to investigate the effect of parameter sharing of adapters across BERT model.
- The code and pre-trained adapters for designing new experiments are available on my Github.

Word Sense Disambiguation in BERT

Winter 2020

- A Deep Study in Word Sense Disambiguation(WSD) Based on "GlossBert: BERT for Word Sense Disambiguation with Gloss Knowledge".
- We re-implemented the approach introduced in Huang et al. (2019) and validated their results on different datasets.
- We investigated the proposed approach in different settings and models, such as XLNet and RoBERTa.

Certificates

Mexican NLP Summer School 2021

Jun. 2021

- Co-located event with NAACL 2021, online

Fourth IPM Advanced School on Computing: Artificial Intelligence

Aug 2020

- by Institute for Research in Fundamental Sciences, Iran

Resource-aware Machine Learning - 5th International Summer School

Aug 2020

- by TU Dortmund, Germany

DeepLearning.AI TensorFlow Developer Professional Certificate

Apr - Jun 2020

- by deeplearning.ai, Coursera
- Introduction to TensorFlow for Artificial Intelligence, Machine Learning, and Deep Learning
- Convolutional Neural Networks in TensorFlow
- Natural Language Processing in TensorFlow
- Sequences, Time Series and Prediction

Skills and Languages

Skills:	• Algorithms, Machine Learning, Deep Learning, Game Theory	Languages:	• Farsi, Native
	• Tensorflow, Keras, PyTorch, Numpy, matplotlib		• English, Fluent
	• Proficient in: Python, C++, MATLAB		• French, limited
	• Familiar with: C#, SQL		• Arabic, limited

Volunteer Experience

Computer Engineering Scientific Student Association of IUST

May 2016 - 2017

Varigaran Club of Sharif University of Technology

Feb 2016 - 2018

- Organizing Educational Programs for Child Labourers

References

Mohammad Taher Pilehvar

- Assistant Professor at Tehran Institute for Advanced Studies (TelAS) and an Affiliated Lecturer at the University of Cambridge.
- Email: mp792@cam.ac.uk

Behrouz Minaei Bidgoli

- Associate Professor in the Computer Engineering Department at IUST.
- Email: b_minaei@iust.ac.ir