Ayyoob Imani

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linkedin

Research Interests

Parameter efficiency in NLP, Applications of large language models, Multilingualism and cross-lingual transfer, Representation learning, low-resource learning.

Education

PhD in Computer Science — **Munich, Germany**
University of Munich (Ludwig-Maximilians-Universität München) — *11/2020-present*

- Focus: Multilingualism and low-resource Natural Language Processing
- Supervisor: Hinrich Schuetze
- Anticipated graduation date: June 2024

MEng in Computer Engineering — **Tehran, Iran**
University of Tehran — *09/2016-06/2019*

- GPA : $4.0/4.0$
- Thesis Topic: *Semantic matching for information retrieval systems*
- Supervisor: Azadeh Shakery

BEng in Computer Engineering — **Tehran, Iran**
Iran University of science and technology — *09/2010-09/2015*

- GPA : $3.71/4.0$

Professional Experience

Research Intern — **Berlin, Germany**
Microsoft — *06/2023-03/2024*

- Submitted 5 patents on large language model efficiency.
- Increased decoding throughput of large language models by up to 2 times.
- Published a paper on efficient large language models generation, improving the state of the art by up to 30%.

Technical Manager/ Software Engineer
TSETMC Is the main IT solution provider for stock markets in Iran. — *10/2016-10/2020*

- Initiated as part-time incubating employee, developed and led an efficiency team, reporting directly to the CTO.
- Improved trading and surveillance systems' efficiency from 200 to above 2000 orders per second.
- Skills & technologies: Proficient in C, C++, Java, Oracle, Linux; experienced in team leadership.

Software Engineer
Oddrun — *11/2015-10/2016*

- Part of a team that developed a push notification service, capable of handling millions of online users.
- Technologies: Java, Hibernate, NGINX, C, Redis, Posgresql, python.

Co-founder, Technical Manager
HISIS — *01/2013-10/2015*

- Localized and implemented accounting and E-ccomerce modules for BarezPakhsh based on Apache OFBiz.
- Co-founder and technical manager

Publications

[1] **Imani, A.**, Lin, P., Kargaran, A., Severini, S., Sabet, M. J., Kassner, N., Ma C., Schmid, M., Martins, A., Yvon, F., & Schütze, H. Glot500: Scaling Multilingual Corpora and Language Models to 500 Languages. **[paper]**

[code]

[2] Modarressi, A., **Imani, A.**, Fayyaz, M., & Schütze, H. RET-LLM: Towards a General Read-Write Memory for Large Language Models **[paper]**

[3] Ma, C., **Imani, A.**, Ye, H., Asgari, E., & Schütze, H. A Dataset for Multilingual Text Classification in 1500 Languages. **[paper] [code]**

[4] **Imani, A.**, Severini, S., Sabet, M. J., Yvon, F., & Schütze, H. (2022, December). Graph-Based Multilingual Label Propagation for Low-Resource Part-of-Speech Tagging. EMNLP 2022. **[paper] [code]**

[5] Movahedi, S., Adabinejad, M., **Imani, A.**, Keshavarz, A., Dehghani, M., Shakery, A., & Araabi, B. N. (2022). Λ-DARTS: Mitigating Performance Collapse by Harmonizing Operation Selection among Cells. ICLR 2023. **[paper] [code]**

[6] **Imani, A.**, Şenel, L. K., Sabet, M. J., Yvon, F., & Schütze, H. (2022). Graph neural networks for multiparallel word alignment. Findings of ACL 2022 **[paper] [code]**

[7] Severini, S., **Imani, A.**, Dufter, P., & Schütze, H. (2022). Towards a broad coverage named entity resource: A data-efficient approach for many diverse languages. LREC 2022 **[paper] [resource]**

[8] **Imani, A.**, Sabet, M. J., Şenel, L. K., Dufter, P., Yvon, F., & Schütze, H. (2021). Graph algorithms for multiparallel word alignment. EMNLP 2021 **[paper] [code]**

[9] **Imani, A.**, Sabet, M. J., Dufter, P., Cysouw, M., & Schütze, H. (2021). ParCourE: A Parallel Corpus Explorer for a Massively Multilingual Corpus. ACL 2021 **[paper] [code]**

[10] **Imani, A.**, Vakili, A., Montazer, A., & Shakery, A. (2018). An Axiomatic Study of Query Terms Order in Ad-hoc Retrieval. ECIR 2019 **[paper]**

[11] **Imani, A.**, Vakili, A., Montazer, A., & Shakery, A. (2018). Deep Neural Networks for Query Expansion using Word Embeddings. ECIR 2019 **[paper]**

Honors and Awards

- ACL 2023 Multilingualism and Cross-Lingual NLP Area Chair award.
- Ranked 2nd in "Yadegar ACM cup", Yadegar Emam University, Tehran, Iran (2016).
- Ranked 41st among 30K participants in "M.Sc. University Entrance Exam in Software Engineering Field" (2016).
- Ranked top 0.1% among approximately 400K participants in "Iran National University Entrance Exam" (2010).

Programming Skills

- **Languages (excellent):** Python, C/C++, Java
- **Languages (familiar with):** R, SQL, Bash
- **Machine learning frameworks:** PyTorch, Tensorflow, keras, Pytorch Geometric, HuggingFace
- **Other:** Git, Docker, Numpy, Scikit-learn,

Teaching Experience

- Natural language processing (Spring 2018)
- Neural Networks and deep learning (Spring 2018 and Fall 2018)
- Statistical inference (Spring 2018)
- Information retrieval (Fall 2017 and Fall 2018)
- Data mining (Spring 2018)

Languages

Persian (*Native*), English (*C2*), German (*A2*)