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# Mohamad Zamini

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## Summary

As a PhD student in Machine Learning and Natural Language Processing, I specialize in visual and text reasoning. I also excel in deploying large language models (LLMs) effectively. My solid foundation in software engineering has empowered me to make meaningful contributions to notable projects such as Pytorch-Geometric, LangChain, Open-Assistant, Gymnasium, and Gorilla. I excel in collaborative teams and driving projects to success.

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## Experience

07/2024 - 09/2024

**Numenta** — Redwood City, CA

### Machine Learning Intern

- Fine-tuned LLM models, including Mistral, LLaMA, and GPT, leveraging techniques such as activation sparsity and attention sparsity to optimize performance.
- Developed techniques such as KWTA, dynamic context pruning, and KV caching.

06/2022 - 08/2024

**Petrolern** — Atlanta, GA

### Digital Innovation Intern

- During my internship at Petrolern as a Digital Innovation Intern, I gained experience in both machine learning and data compression techniques
- I developed a semantic compression technique using a deep autoencoder to effectively map data tuples into a lower-dimensional representation
- As a machine learning engineer, I built models for analyzing geothermal data and improved their performance through algorithmic optimization

06/2018 - 08/2019

**Lifeweb** — Tehran, Iran

### NLP Engineer

- Fine-tune models like BART for summarization on Persian text data.
- Implementing Matrix Factorization for topic modeling.
- BiLSTM-CRF Models for sequential tagging.

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## Education and Training

**University of Wyoming** Laramie, WY

Ph.D.: Computer Science

Area of research: Causal Reasoning for Improving Generalization in Visual Question Answering

- Generated new benchmark dataset. Developed Multi adaptor MoE-LLaVA reasoning model which outperforms current LLaVA models. Currently working on accurately decomposing occluded shapes for question answering within our dataset.

09/2018

**University of Tarbiat Modares** Tehran, Iran

Master of Science: Information Technology

09/2016

**University of Science And Culture** Tehran, Iran

Bachelor of Science: Computer Engineering

## Papers

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- Zamini, M., Shukla, D. (AAAI 25 Submission). Q-Route: Quaternion based Actor-Critic for KG Reasoning
- Zamini, M., Shukla, D. (ICLR 25 Submission). FMoE-LLaVA reasoner: Fast Mixture of experts LLaVA reasoner
- Zamini, M., Reza, H. & Rabiei, M. (2022). A review of knowledge graph completion. Information, 13(8), 396.
- Zamini, M., Montazer, G. Credit card fraud detection using autoencoder based clustering. In 2018 9th International Symposium on Telecommunications (IST), 486-491. IEEE.

## Skills

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| • Machine Learning | • PyTorch  |
| • Python           | • Codebase |
| • LLM/VLM          | • ONNX     |

## Teaching Assistant Experiences

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- Introduction to Programming
- Introduction to Artificial intelligence
- Software Design