

# Zhivar Sourati

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## Education

Ph.D. Computer Science | [University of Southern California, CA, US](#) | 2022 – Present

Analogical Reasoning, Commonsense Reasoning, Prototype-based Reasoning, NLP, Social Psychology and Large Language Models (LLMs), and Bias/Fairness (GPA: 4.0 / 4.0)

B.Sc. Computer Engineering | [University of Tehran, Tehran, Iran](#) | 2017 - 2021

Thesis: Comparison of the Performance of Permutation and Randomization Tests on Graphs (GPA: 4.0 / 4.0)

## Research & Work Experience

Research Intern | [Genentech](#) | 2024

Knowledge Graph and Large Language Models intern working on biomedical knowledge graphs and their usage for KG-aware biomedical representations.

Research Assistant | [Information Sciences Institute \(ISI / USC\)](#) | 2022 – Present

Focused on cognitively inspired and explainable methods like analogical reasoning, case-based reasoning, and prototype-based reasoning and their applications, such as fallacy identification. Plus, studied the effect of LLMs in social psychology.

NLP Research Assistant | [Zurich University of Applied Sciences](#) | 2021 – 2022

Analyzed automatic summarization techniques, both extractive and abstractive, using Transformers and knowledge graphs. Also, worked on hate speech analysis and prediction on Twitter timelines.

Research Assistant | [University of Tehran](#) | 2020 – 2021

Focused on the applications of machine learning, social network analysis, and non-parametric and permutation tests on complex networks with models such as Exponential Random Graphs (ERGMs). Further, analyzed data mining techniques, mainly directed on Twitter and Elasticsearch.

NLP Research Intern | [TeIAS](#) | 2020

Explored NLP models, datasets, and common tasks, such as [NER](#) and [QA chatbots](#) on practical projects, reviewed SOTA models, and gathered [Datasets for Farsi \(Persian\) Natural Language Processing](#).

## Publications & Posters

- Sourati, Z., Ozcan, M., McDaniel, C., Ziabari, A., Wen, N., Tak, A., Morstatter, F., & Dehghani, M. (2024). Secret Keepers: The Impact of LLMs on Linguistic Markers of Personal Traits. arXiv preprint arXiv:2404.00267. (Under review)

- Ahrabian, K., Sourati, Z., Sun, K., Zhang, J., Jiang, Y., Morstatter, F., & Pujara, J. (2024). The Curious Case of Nonverbal Abstract Reasoning with Multi-Modal Large Language Models. *arXiv preprint arXiv:2401.12117*. (Accepted to COLM 2024)
- Jiang, Y., Zhang, J., Sun, K., Sourati, Z., Ahrabian, K., Ma, K., ... & Pujara, J. (2024). MARVEL: Multidimensional Abstraction and Reasoning through Visual Evaluation and Learning. *arXiv preprint arXiv:2404.13591*. (Under review)
- Sourati, Z., Ilievski, F., & Sommerauer, P. (2024). ARN: A Comprehensive Framework and Dataset for Analogical Reasoning on Narratives. *arXiv preprint arXiv:2310.00996*. (Accepted to TACL)
- Deshpande, D., Sourati, Z., Ilievski, F., & Morstatter, F. (2024). Contextualizing Argument Quality Assessment with Relevant Knowledge. In *Proceedings of the 2024 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies (Volume 2: Short Papers)*, pages 316–326, Mexico City, Mexico. Association for Computational Linguistics.
- Sourati, Z., Deshpande, D., Ilievski, F., Gashteovski, K., & Saralajew, S. (2024). Robust Text Classification: Analyzing Prototype-Based Networks. *arXiv preprint arXiv:2311.06647*. (Under review)
- Jiang, Y., Ilievski, F., Ma, K., & Sourati, Z. (2023). BRAINTEASER: Lateral Thinking Puzzles for Large Language Models. In *Proceedings of the 2023 Conference on Empirical Methods in Natural Language Processing*, pages 14317–14332, Singapore. Association for Computational Linguistics.
- Thakur, A. K., Ilievski, F., Sandlin, H. Â., Sourati, Z., Luceri, L., Tommasini, R., & Mermoud, A. (2023). Explainable Classification of Internet Memes. In *NeSy* (pp. 395-409).
- Sourati, Z., Ilievski, F., Sandlin, H.-Â., & Mermoud, A. (2023). Case-based reasoning with language models for classification of logical fallacies. In *Proceedings of the Thirty-Second International Joint Conference on Artificial Intelligence, IJCAI '23*.
- Sourati, Z., Venkatesh, V. P. P., Deshpande, D., Rawlani, H., Ilievski, F., Sandlin, H. Â., & Mermoud, A. (2023). Robust and explainable identification of logical fallacies in natural language arguments. *Knowledge-Based Systems*, 266, 110418.
- Thakur, A., Ilievski, F., Sandlin, H., Mermoud, A., Sourati, Z., Luceri, L., & Tommasini, R. (2023). Multimodal and Explainable Internet Meme Classification. (accepted in AI4SG-23 at AAAI-23, <https://amulyayadav.github.io/AI4SG2023/>)
- ShabaniMirzaei, T., Chamani, H., Abaskohi, A., Sourati, Z., & Bahrak, B. (2023). A large-scale analysis of Persian Tweets regarding Covid-19 vaccination. *Social Network Analysis and Mining*, 13(1), 148.
- Sourati, Z., Sabri, N., Chamani, H., & Bahrak, B. (2022). Quantitative analysis of fanfictions' popularity. *Social Network Analysis and Mining*, 12(1), 42.
- Setayesh, A., Sourati, Z., & Bahrak, B. (2022). Analysis of the global trade network using exponential random graph models. *Applied Network Science*, 7(1), 38.
- Sourati, Z., von Däniken, P., Cieliebak, M. (2022). Ukraine-Russia - First insights into recent Twitter posts about this conflict. *SwissText Conference*; June 2022; Lugano, Switzerland. (Poster presentation)
- Von Däniken, P., Sourati, Z., Tuggener, D. (2022). Hateful Social Media Users - Can we predict their behavior? *SwissText Conference*; June 2022; Lugano, Switzerland. (Poster presentation)
- Chamani, H., Sourati, Z., & Bahrak, B. (2021, October). An Overview of Regression Methods in Early Prediction of Movie Ratings. In *2021 11th International Conference on Computer Engineering and Knowledge (ICCKE)* (pp. 1-6). IEEE.

# Notable Course Projects

## Transcript Analyzer & Converter

An API capable of retrieving dialogues, converting them from and to different transcript structures such as CEASR, and doing various analyses on it, including summarization with methods such as abstractive Transformer-based models and extractive methods using knowledge graphs.

## Permutation Tests

Analyzed various permutation techniques on complex networks, such as node and network permutations. Also, used different modeling approaches such as Exponential Random Graph Models (ERGMs) to study complex networks like the global trade network.

## Neural Networks & Advanced NLP

Studied different architectures covering Transformers, memory neural networks, and convolutional neural networks, as well as a brief study of generative adversarial networks. Also, focused on more traditional NLP techniques on applications such as dependency tree parsing.

## Reinforcement Learning

Studied various models and policies, such as n-armed bandits, On- and Off-policy methods with practical usage like analyzing the monetary value of waiting utilizing Prospect Theory by Daniel Kahneman.

## Artificial Intelligence

Learned the basic ideas in AI, such as clustering, classification, and regression models, as well as searching algorithms like A\* and IDS, and analyzed their applicability on different datasets.

## Advanced Programming

Learned different design patterns and clean coding principles by implementing programs covering diverse subjects such as resource management, social networks, and file compression & cryptography.

# Skills

- Python, R, C, C++, SQL, Java, Typescript, SPARQL
- PyTorch, Hugging Face, Weights & Biases, Keras, Stata, Linux, Spring, Angular, Git, MongoDB, Node.js, MySQL, Neo4j