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 (evaluation of) 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 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

- 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. (Under preparation)
- Sourati, Z., McDaniel, C., Ozcan, M., Wen, N., Ziabari, A., Tak, A., Dehghani, M., & Morstatter, F. (2024). Does ChatGPT Hide Linguistic Signatures of Psychological Traits? (Under preparation)
- Sourati, Z., Ilievski, F., Sommerauer, P., & Jiang, Y. (2023). ARN: A Comprehensive Framework and Dataset for Analogical Reasoning on Narratives. arXiv preprint arXiv:2310.00996. (Under review)
- Deshpande, D., Sourati, Z., Ilievski, F., & Morstatter, F. (2023). Contextualizing Argument Quality Assessment with Relevant Knowledge. arXiv preprint arXiv:2305.12280. (Under review)

- Sourati, Z., Deshpande, D., Ilievski, F., Gashteovski, K., & Saralajew, S. (2023). 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. (Accepted at EMNLP 2023)
- Thakur, A., Ilievski, F., Sandlin, H., Sourati, Z., Luceri, L., Tommasini, R. & Mermoud, A. (2023) Explainable Classification of Internet Memes. https://ceur-ws.org/Vol-3432/paper33.pdf (Accepted at NeSy 2023)
- Sourati, Z., Ilievski, F., Sandlin, H.-Â., & Mermoud, A. (2023). Case-Based Reasoning with Language Models for Classification of Logical Fallacies. (Accepted at IJCAI-23 + poster presentation at NLRSE Workshop - ACL 2023)
- Sourati, Z., Priya, V., Deshpande, D., Rawlani, H., Ilievski, F., Sandlin, H.-Â., & Mermoud, A. (2023). Robust and Explainable Identification of Logical Fallacies in Natural Language Arguments. (Published at KBS)
- Thakur, A., Ilievski, F., Sandlin, H., Mermoud, A., Sourati, Z., Luceri, L., & Tommasini, R. (2023). Multimodal and Explainable Internet Meme Classification. (Published at AAAI-23 + Poster presentation)
- ShabaniMirzaei, T., Chamani, H., Sourati, Z., & Bahrak, B. (2023). A Large-Scale Analysis of Persian Tweets Regarding Covid-19 Vaccination. *arXiv preprint arXiv:2302.04511*.
- Sourati, Z., Sabri, N., Chamani, H. & Bahrak, B. (2022). Quantitative analysis of fanfictions' popularity. (Published at Social Network Analysis and Mining)
- Setayesh, A., Sourati, Z. & Bahrak, B. (2022). Analysis of the global trade network using exponential random graph models. (Published at *Applied Network Science*)
- 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). An Overview of Regression Methods in Early Prediction of Movie Ratings. (Accepted at 11th International Conference on Computer Engineering and Knowledge)

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