Darshan Deshpande

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Education

University of Southern California — Los Angeles, CA
Master of Science in Computer Science — *Aug. 2022 – May 2024*

Mumbai University — Mumbai, India
Bachelor of Engineering in Computer Engineering — *Aug. 2018 – May 2022*

Experience

Research Assistant — Aug. 2022 – Present
Information Sciences Institute — *Marina del Rey, CA*

- Published novel methods for improving the qualitative understanding of argumentation in large language models.
- Created explainable NLP models for text classification, focusing on robustness against open- domain attacks.
- Conducted research on detecting hierarchical logical fallacies in arguments, employing curriculum- and prototype-based learning to address imbalanced datasets and improve explainability.

Publications

Contextualizing Argument Quality Assessment with Relevant Knowledge — May 2023
***Darshan Deshpande**, Zhivar Sourati, Filip Ilievski, Fred Morstatter* — *NAACL 2024*

Robust Text Classification: Analyzing Prototype-Based Networks — Nov. 2023
*Zhivar Sourati, **Darshan Deshpande**, Filip Ilievski, Kiril Gashteovski, Sascha Saralajew* — *arXiv Preprint*

Robust and Explainable Identification of Logical Fallacies in Natural Language Arguments — Dec. 2022
*Zhivar Sourati, Vishnu Priya Prasanna Venkatesh, **Darshan Deshpande** ...* — *Knowledge Based Systems*

Projects and Reports

Exploring Diffusion Models with JAX | *Python, JAX, TPU* — June 2022

- Explores the mathematics and code of discrete diffusion models, their effectiveness, applicability, and limitations.

Review Classification using Active Learning | *Tensorflow, Keras, GPU* — Oct. 2021

- Demonstrates the effectiveness of active learning in text classification tasks by implementing a ratio-based sampling approach, improving performance and suitability for industrial applications.

The Reality Behind the Optimization of Imaginary Variables - I and II | *Research* — Jun 2021 – Oct 2021

- Leverages complex-valued neural networks to enhance representations by experimenting with traditional mappings and more efficient complex vector techniques.
- Explores circularity and holomorphicity constraints in complex-valued neural networks, showcasing the effectiveness of linear and widely linear networks for image-denoising.

MelGAN based Spectrogram Inversion using Feature Matching | *Reproducibility* — Sep. 2021

- Showcases a non-autoregressive model for spectral inversion utilizing a feature-matching discriminator, highlighting fast inference on dynamic inputs.

Research Grants and Awards

Google OSS Expert Award (2022): For releasing open-source articles with code for exploring diffusion models.
Papers With Code Top Contributor Award (2022): For open-source and reproducibility contributions with JAX.
Google Research Grant (2021): A $5,000 grant to investigate the robustness of ML-based steganography methods.

Technical Skills

Languages: Advanced Python, CUDA, C, Java, SQL, JavaScript, HTML/CSS
Machine Learning: Pytorch, Tensorflow, Keras, JAX, Hugging Face, Sklearn, XgBoost, Pandas, NumPy, Matplotlib
Deployment: Docker, Flask, Django, RestAPI, FastAPI
Developer Tools: Git, Docker, Google Cloud Platform, Amazon AWS, Microsoft Azure
Database Management: MongoDB, MySQL, PostgreSQL, SQLite