Sherin Muckatira

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Education

University of Massachusetts — Lowell, Massachusetts
Ph.D. in Computer Science; GPA 4.00 — September 2021–Present
Advisor: Prof. Anna Rumshisky

Arizona State University — Tempe, Arizona
Master of Science in Electrical Engineering; GPA 3.79 — August 2011–May 2013

Sir M Visvesvaraya Institute of Technology — Bangalore, India
Bachelor of Engineering in Electronics and Communication; GPA:4.00 — September 2007–July 2011

Publications

[1] S. Muckatira, V. Deshpande, V. Lialin, and A. Rumshisky, "Emergent abilities in reduced-scale generative language models", in *Findings of the Association for Computational Linguistics: NAACL*, 2024.

[2] V. Lialin, S. Muckatira, N. Shivagunde, and A. Rumshisky, "Relora: High-rank training through low-rank updates", in *The Twelfth International Conference on Learning Representations*, 2023.

[3] N. Shivagunde, V. Lialin, S. Muckatira, and A. Rumshisky, "Deconstructing in-context learning: Understanding prompts via corruption", in *Proceedings of the 2024 Joint International Conference on Computational Linguistics, Language Resources and Evaluation (LREC-COLING 2024)*, 2024, pp. 4509–4529.

[4] S. Pan, V. Lialin, S. Muckatira, and A. Rumshisky, "Let's reinforce step by step", in *NeurIPS 2023 Workshop on Instruction Tuning and Instruction Following*, 2023.

[5] S. Muckatira, "Properties of winning tickets on skin lesion classification", *ECCV WiCV Workshop*, 2020.

[6] Q. Sun, S. Muckatira, L. Yuan, S. Ji, S. Newfeld, S. Kumar, and J. Ye, "Image-level and group-level models for drosophila gene expression pattern annotation", *BMC bioinformatics*, vol. 14, pp. 1–13, 2013.

Skills

Python, Pytorch, sklearn, Machine Learning, Deep Learning, NLP, Huggingface Transformers, generative AI, pre-training, fine-tuning, prompting, zero-shot/few-shot evaluation, C, C++, Perforce, Git, Matlab, Embedded Systems, Signal Processing, Data Analysis, Software development

Reserach Experience

University of Massachussetts — Lowell, MA
Research Assistant, PI: Prof. Anna Rumshisky — May 2023–Present

1. LoRA with restarts (ReLoRA) Fine-tuning
   Explored if ReLoRA, a parameter efficient pre-training method, can be adopted for fine-tuning. Fine-tuned and compared performance of T5-base (220M params) and T5-large (770M params) with ReLoRA and LoRA on the GLUE benchmark. Analyzed stable ranks of updates across different pre-training checkpoints.
2. In-Context Learning (ICL) in Small Language Models
   Investigated emergent abilities in these small language models. Pre-trained LLama configuration based models on vocabulary filtered SlimPajama dataset to induce ICL capabilities in smaller models.

Arizona State University — Tempe, AZ
Research Aide, PI: Prof. Jieping Ye — July 2012–May 2013
Implemented Gene expression pattern annotation using SIFT feature extraction on images in the Berkeley Drosophila Genome Project (BDGP). Constructed Codebooks using Bag of Words and Sparse Coding Approach.

Industry Experience

Amazon May 2024–August 2024
Applied Scientist Intern
Investigated whether custom fine-tuned small language models can achieve performance comparable to in-context-learning in large language models for extractive content extraction.

Qualcomm October 2016–December 2021
Senior Software Engineer
Developed firmware for the physical layer of Wireless LAN chips using the Wifi 802.11 protocol, including the design and implementation of features such as Spectral Scan and Radar Detection.

NXP June 2013–October 2016
Applications Software Engineer
Developed signal processing applications for radio communication, focusing on transmit and receive chains on a Vector Signal Processor for Power Amplifier characterization. Implemented communication interfaces between host processors and co-processors to enhance functionality in Power Amplifier characterization applications.

Teaching Experience

Teaching Assistant (TA), COMP 1030L: Computing 1 Lab; Fall 2022, Spring 2023