SAHANA S. KOWSHIK

sahanakowshik.github.io

RESEARCH INTERESTS

Reinforcement learning, natural language processing, medical imaging applications, computer vision

EDUCATION

Boston University | **Boston, MA** September 2023 – Present
Doctor of Philosophy in Computing & Data Sciences **CGPA**: 3.84/4.0

Boston University | **Boston, MA** January 2023
Master of Science in Computer Science **CGPA**: 3.93/4.0

RV College of Engineering | **Bengaluru, Karnataka, India** August 2021
Bachelor of Engineering in Electronics and Communication Engineering **CGPA**: 9.09/10.0

PUBLICATIONS

- Xue, C.*, Kowshik, S.S.*, et al., **AI-based differential diagnosis of dementia etiologies on multimodal data**, *Nature Medicine* (2024) https://doi.org/10.1038/s41591-024-03118-z
- Jasodanand, V. H., Kowshik, S.S., et al. **AI-driven fusion of multimodal data for Alzheimer's disease biomarker assessment**. *Nature Communications*, August 2025.

RESEARCH PROJECTS

Enhancing Diagnostic Reasoning in LLMs for Dementia diagnosis July 2024 – Present
Research Fellow, with Prof. Vijaya Kolachalama Boston, MA

Working on improving the diagnostic reasoning of large language models using reinforcement learning with verifiable rewards (RLVR) methods such as Group Relative Policy Optimization (GRPO) by utilizing clinical data and neuroimaging reports (from MRIs, PET scans, CT scans, and EEGs)

PROJECTS

CS 599M1 Course project: Grammatical Person Representation in Large Language Models 2025

In this work, we studied how LLMs internally represent grammatical person (the distinction between "I" and "you") and how this representation relates to the personas they adopt during generation.

CS 523 Course project: Visually Perspective Similarity Metric for Text-to-Image Models 2022

Developed a robust similarity metric combining L2 norm, cosine similarity, and inception score to quantify image similarity between outputs from Stable Diffusion and DALL-E2 under perturbed text prompts

CS 505 Course project: Multilingual emoji prediction 2022

Fine-tuned various state-of-the-art discriminative and autoregressive language models such as multiBERT, XLM-Roberta, mDeBERTa, GPT-2, DistilGPT-2, and GPT-Neo to accurately predict emojis for English and Spanish tweets. Our results outperformed the baseline set in the SemEval Competition-2018

CS 542 Course project: Image Classification on Covid-19 X-rays 2022

Built binary and multi-class image classifiers on a COVID-19 X-ray dataset using VGG19 and Xception architectures in Keras

INDUSTRY EXPERIENCE

BU Spark February 2022 – December 2022
Machine Learning intern (Part-time) Boston, MA

Built a reliable machine learning framework using BERT backbone to recognize the semantic difference between mentions of race vs. mentions of color in non-racial terms in the media articles

Mentor Graphics January 2021 – June 2021
Embedded software development and QA intern Bengaluru, India

- Worked on the development and testing of the embedded Linux Flex operating system
- Automated the process of embedded testing using Unix test scripts and CI/CD tools like Jenkins and LAVA

TEACHING EXPERIENCE

- CDS DS120 Fall 2025
- CDS DS120 Spring 2026

SELECT GRADUATE COURSEWORK

- **CS505**: Introduction to Natural Language Processing
- **CS542**: Machine Learning
- **CS523**: Deep Learning
- **DS543**: Introduction to Reinforcement Learning
- **CS582**: Mathematical Statistics
- **CS585**: Image and Video Computing
- **CS599**: User-centric Systems for Data Science
- **CS630**: Advanced algorithms

ACHIEVEMENTS & OTHER PROFESSIONAL ACTIVITIES

* Invited as a Guest speaker for the **BU AI4ALL** program to give a talk to high school students about AI in healthcare.
* Won silver tier in the **3rd NeurIPS 2022 Neural MMO challenge** on Learning to Specialize in Massively Multiagent Open Worlds
* **Grace Hopper Celebration Conference Scholarship 2022**, Boston University

SKILLS

* **Programming Languages**: Python, C++, Java
* **Relevant tools**: PyTorch, Tensorflow, NLTK, HuggingFace, wandb.ai, OpenCV, Numpy, Pandas, Scikit-Learn, Matplotlib, NetworkX, Git, Linux