

Himanshu Shekhar Sahoo

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<https://sahoo009.github.io/>

EDUCATION

PhD Candidate in Electrical Engineering
University of Minnesota (UMN) - Twin Cities

Expected Graduation Date: Aug 2023
Minneapolis, MN

***Relevant Coursework:** Artificial Intelligence (AI), Machine Learning (ML), Predictive Learning from Data, Non-Linear Optimization, Scalable Algorithm Techniques in GPU's, Data Modeling Using R, Advanced Computer Architecture*

***Research Interests:** Machine learning (ML) and GPGPU architecture optimization, Natural Language Processing (NLP), Interpretable ML, Fairness in ML*

SKILLS

***Programming Languages:** Python, NVIDIA CUDA C, R, MATLAB, C++, C, SQL, Java, Julia, OpenMP*

***Machine Learning and Natural Language Processing:** R, MATLAB, Python (eg: tensorflow, keras, pytorch, transformers, spaCy, detectron2, pyeda, scikit-learn, fairlearn, LIME, SHAP), IBM Cloud Watson Speech-to-Text*

***High Performance Computing:** NVIDIA CUDA C, OpenMP, Julia*

RESEARCH PROJECTS

Intelligent Simultaneous Multi Kernel Execution on GPUs

Jan 2020 - Present

Led a team of four students in implementing ML models to schedule multiple kernels on GPUs to maximize throughput and efficiency.

AmbiScribe: Intelligent Assistance for Real Time Decision Support and EHR Population

Aug 2019 - Present

Implementing an end-to-end interpretable and fairness aware AI pipeline to analyze Electronic Health Record and doctor-patient audio encounters to aid in clinical decision support.

WORK EXPERIENCE

Lead AI and NLP Researcher (UMN, Electrical Engineering)

Aug 2019 - Present

Developing grant proposals, writing journals, securing funding, exploring existing literature and state-of-the-art speech-to-text tools for project specific use cases, and increasing cross-collaboration with multiple teams across various institutions.

Deep Learning Researcher (UMN, Department of Surgery)

Jan 2021 - Present

Using ML and NLP techniques, developing a novel clinical annotation system for high-volume, real-time extraction and analysis of acute and long-term COVID-19 symptoms from unstructured patient notes. Comparable to other state-of-the-art clinical annotation systems, the developed system was the quickest, utilized little computational resources, and had good symptom extraction performance.

Health Futures Researcher (Microsoft)

June 2022 - Aug 2022

Developed lesion detection pipeline to identify lesions (sprains, cartilage loss, fracture etc) present in a patient's MRI image reconstructed using undersampled data. In addition to detecting rare lesions, the pipeline had similar detection performance for MRI images reconstructed using no undersampling and MRI images reconstructed using an undersampling factor of 2, 4 and 8.

Teaching Instructor (UMN, Department of Electrical Engineering)

Sept 2016 - Dec 2021

Ability to work under pressure while teaching and grading assignments in more than 20 undergraduate and graduate level classes with class sizes ranging between 20-150 students.

AI Infrastructure Data Science Intern (NVIDIA)

May 2018 – Aug 2018

Developed state of the art multi-core multi-GPU ML models in CUDA C++. Analyzed and alleviated existing scaling inefficiencies present in these ML models. The developed models were a part of the NVIDIA RAPIDS library.

PUBLICATIONS

Himanshu S. Sahoo, Nicholas E. Ingraham et al., “Towards Fairness and Interpretability: Clinical Decision Support for Acute Coronary Syndrome” in Proc. International Conference on Machine Learning and Applications 2022.

Greg M. Silverman, **Himanshu S. Sahoo** et al., “NLP Methods for UMLS Concept Extraction of Symptoms from Unstructured Data for use in Prognostic COVID-19 Analytic Models” in Proc. Journal of Artificial Intelligence Research 2021.

Himanshu S. Sahoo*, Greg M. Silverman* et al., “A fast, resource efficient and reliable rule-based system for COVID-19 symptom identification” in Proc. Journal of American Medical Informatics Association Open 2021.

(* :- equal contributing authors)