Tripp Dow
Undergraduate Computer Science Student

Contact Information

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GitHub	*github.com/prettytrippy*

Education

Bachelor of Arts in Computer Science — *University of Minnesota, Twin Cities, Minneapolis, Minnesota*

Expected Graduation: May 2025

3.8 GPA. Honors Program. Minors in mathematics and philosophy.

Work Experience

Undergraduate Research Assistant
Minnesota NLP Group
September 2023 - Present
Creating tools for scientific communication using generative AI.

Software Engineering Intern
Emercent Technologies
August 2023
Developed a web server for medical data storage and processing. Designed and began training of a transformer model for spirometric calibration. Contributed to a GUI for medical device control.

Undergraduate Research Assistant
Michigan State University
May 2023 - July 2023
Developed methods for author name disambiguation in large datasets of academic literature. Methods included string-based approaches, a large-language model classifier, and a co-author network search. Part of the National Science Foundation REU OAC1949912.

Software Engineering Intern
Area 10 Labs
June 2022 - August 2022
Created a mobile application for digital spirometry, including calibration, storage, and Fourier analysis. Assisted in the fabrication and soldering of medical equipment. Created algorithms to model human respiration.

Research Interests

- Computational Neuroscience
- Computational Meta-Research
- Medical Devices
- Generative AI

Projects

SciTok
Affiliation: Minnesota NLP Group
Fall 2023 - Present
I am currently leading a project to increase public access to academic research, using generative AI.

Calibration Transformer
Affiliation: Emercent Technologies
Summer 2023
In order to calibrate a spirometer, it is necessary to find the conductance coefficients which map observed

flow values to true flow values. During my time at Emercent, I created a dataset and transformer model to calculate such an array. Since only certain properties of a solution are known, rather than ground truth, I developed a custom-made loss calculation algorithm for training. The model architecture was designed to minimize storage space and inference speed, while providing accurate results.

Graphical Methods for Author Name Disambiguation
Affiliation: MSU DeepThought Initiative
Summer 2023
As part of a National Science Foundation REU, I designed an Author Name Disambiguation (AND) system using a random forest classifier. The system utilizes graphical information about the co-author network surrounding a given publication, achieving high accuracy with limited publication attributes. Validated using labeled ORCID data.

BreathMetrics
Affiliation: Area 10 Labs
Summer 2022
Developed a mobile application for spirometry using the Unity framework. The app reads time-series respiratory data, applies digital signal processing techniques, and presents comprehensible graphics.

Publications

Enhancing Author Name Disambiguation with Graphical Attributes
Work in progress
Developed a unique algorithm for author name disambiguation using publication titles and author names, achieving a 96% success rate in NASA ADS/ORCID datasets. This method, leveraging a coauthor network and a random forest classifier, offers a scalable solution for large bibliographic databases with sparse publication attributes.

Skills

- **Programming Languages**: Python, C/C++, C#, Java
- **Software Development**: Docker, Git, Flask, ngrok
- **Machine Learning/Data Science**: HuggingFace, PyTorch, Pandas, Tensorflow
- **Hardware and Electronics**: Soldering, Arduino, Medical Devices
- **Other**: Bash, LaTeX, Digital Signal Processing

Awards and Honors

UMNTC Dean's List	*Fall 2021 - Fall 2023*
SEIU Cecilia Razook Essay Scholarship	*Fall 2023*

Professional Affiliations

- Member, Society of Research Software Engineering

Extracurricular Activities

Epistemai, Undergraduate Journal of Philosophy:
- Editor-in-Chief: Fall 2023 - Present
- Head Staff Writer and Editor: Fall 2022 - Spring 2023
- Editor: Spring 2022

UMN Philosophy Club
- President: Fall 2022 - Present
- Secretary: Spring 2022
- Member: Fall 2021

References

Both academic and industrial references are available upon request.