

Brian Hsu

1822 Ridge Ave, Evanston, IL 60201 • 630-390-0328 • brian.hsu@northwestern.edu

RESEARCH INTERESTS

Embodied Agents: Develop embodied agents as autonomous platforms to streamline experimental workflows in biological laboratories.

Generative Methods: Advance generative models for synthetic data augmentation and robust object-style transfer in reinforcement learning.

EDUCATION

Northwestern University , Evanston, IL	Expected March 2024
<i>Master of Science in Statistics and Data Science</i>	GPA: 3.71/4.00
Northwestern University , Evanston, IL	December 2021
<i>Bachelor of Arts in Statistics and Biology</i>	GPA: 3.60/4.00

RESEARCH EXPERIENCE

Argonne National Laboratory	Summer 2023 - Present
<i>Graduate Student Researcher</i>	Lemont, IL

- Developed GPT-powered embodied agent capable of robotically automating liquid-handling protocols from natural language instructions.
- Programmed user interface enabling embodied agent to suggest protocols, adapt to environment feedback for error correction, and archive successful protocols for future recall.
- Optimized large language models for translating natural language instructions into robot-executable code.

Department of Statistics and Data Science, Northwestern University	Winter 2023 - Present
<i>Graduate Student Researcher</i>	Evanston, IL

- Enhanced reinforcement learning agent generalization through generative model-driven synthetic data augmentation.
- Developed a pipeline for segmentation and text-to-image conversion that produces object-centered training images from language commands.
- Refined a hybrid large language-diffusion model to elevate style transfer and enhance prompt understanding in complex, multi-round prompting for text-to-image generation.

NSF-Simons Center for Quantitative Biology	Spring 2020 – Fall 2021
<i>Undergraduate Student Researcher</i>	Evanston, IL

- Trained systems infection models on polling data as a novel method for election forecasting.
- Sparse predictive modeling was implemented to increase model selection speed by 90% and uncover new voting dynamics.
- Data visualization and sensitivity analysis were utilized to quantify state-to-state voting dynamics across 2008-2016 elections.

HONORS AND GRANTS

Northwestern-Argonne Student Grant	Summer 2023
Six-time Northwestern University Dean's List	Fall 2017 – Winter 2021
Fletcher Prize Finalist	Summer 2020
Northwestern Summer Undergraduate Research Grant	Spring 2020

PRESENTATIONS

Using Language Models as Embodied Agents for Automation. Argonne National Laboratory Hackathon, Lemont, IL, October 2023.

Selection and Analysis of U.S. Forecasting Models. 2020 Summer QBio Symposium, Northwestern University, Evanston, IL, August 2020.

Selection and Analysis of U.S. Forecasting Models. Mangan Group, Northwestern University, Evanston, IL, July 2020.

TEACHING

Graduate Bootcamp Teaching Assistant	Summer 2023
<i>Department of Statistics and Data Science, Northwestern University</i>	Evanston, IL
<ul style="list-style-type: none">• Facilitated office hours for 28 Statistics graduate students (both PhD and Master's).• Designed, wrote, and graded coding assignments for data science applications.• Worked with course instructor on providing feedback to graduate students.	
Graduate Teaching Assistant	Fall 2022-Spring 2023
<i>Department of Statistics and Data Science, Northwestern University</i>	Evanston, IL
<ul style="list-style-type: none">• Facilitated weekly discussion sections for more than 60 students and hosted weekly office hours to help students understand statistical methods.• Proctored midterm and final exams, and graded all assignments under tight deadlines.	

WORK EXPERIENCE

Shin-Ah Scrap Inc.	Fall 2017 – Present
<i>Logistics and Expense Coordinator</i>	Chicago, IL
<ul style="list-style-type: none">• Managed database for scrap metal transactions. Improved transparency of transaction data through database documentation and workflow organization.• Increased operating income of business by overseeing over \$6,000,000 in domestic/international scrap metal sales and purchases.	
Feinberg School of Medicine	Summer 2021 – Fall 2021
<i>Research Study Coordinator</i>	Evanston, IL
<ul style="list-style-type: none">• Responsible for participant recruitment and retention efforts in the All of Us Research Program.• Increased scope of outreach events by coordinating participant recruitment, partnership events, and advertisement initiatives.	

LEADERSHIP

American Statistics Association Northwestern Chapter	Fall 2020 - Present
<i>Founding Co-Treasurer</i>	Evanston, IL
<ul style="list-style-type: none">• Established funding of organization by drafting 5 proposals for organization funding.• Co-reviewer and editor of club constitution.	
Shirley Ryan Ability Lab	Fall 2022 – Spring 2023
<i>Clinical Volunteer</i>	Evanston, IL
<ul style="list-style-type: none">• Managed food services, medical supplies, and patient transportation in rehabilitation center.	
Symphony of Evanston	Fall 2019 – Fall 2023
<i>Clinical Volunteer</i>	Evanston, IL
<ul style="list-style-type: none">• Organized and facilitated at least two group activities per week for 20 memory-loss patients.	
Active Minds Northwestern	Fall 2018 – Fall 2022
<i>Head Committee of Special Events</i>	Evanston, IL
<ul style="list-style-type: none">• Hosted up to 10 events each year through stress-relief events and speaker panels designed to raise mental health awareness.• Coordinated Stress Less Week events designed to provide stress relief to undergraduate students.	
Volunteer Tutor	Fall 2014 – Fall 2018
<i>NHS and YMCA</i>	Chicago, IL
<ul style="list-style-type: none">• Served as a volunteer tutor in STEM for students K-8 in the National Honors Society and YMCA.	

TECHNICAL SKILLS

Programming: R, Stata, Python, PyTorch, Huggingface, Matlab, SAS, PyMol, Shell Scripting
Computational: Language Models, Diffusion Models, Reinforcement Learning, Statistical Computing, optimization, regression, time series, data sampling, and data visualization methods
Wet Lab: PCR, DNA/ RNA/protein isolation, purification, and expression, SDS-PAGE, chromatography