Yutong Wu

(+1) 617-803-4621 | ywu4@g.harvard.edu

EDUCATION

Harvard University, Cambridge, MA M.Eng May 2024(expected)

Majors: Computational Science Engineering

Macalester College, Saint Paul, MN B.A. May 2022

Majors: Applied Mathematics and Statistics, Computer Science

GPA: 3.90, Summa Cum Laude, Macalester Dean's List Fall 2018, Spring 2019, Spring 2020, Fall 2020

RELATED EXPERIENCE

Research Interests: Cognitive/Neuro - Inspired AI, Computational Cognition, Reinforcement Learning, HCI, Human-Centered AI

@MIT

Theory of Mind Exploration in Household Environment Oct 2022 - Present 2023

- Developed a dataset and sampling scheme for studying Theory of Mind (ToM) inference in household environments, employing scene graphs to create diverse settings.
- Participated in designing an inference algorithm using bayesian inverse planning for human-level ToM inference utilizing a neuro-symbolic framework.
- Utilized GPT-3.5 to generate scenario-based questions for benchmark evaluations and conducted comprehensive benchmarking to validate performance.
- Submitted paper titled *MMToM-QA: Multimodal Theory of Mind Question Answering* to the International Conference on Learning Representations and FDMD@NeurIPS 2023, with project details available on GitHub.

@Harvard

Computational Cognitive Modeling Workshop May 15th - 19th 2023

- Gained comprehensive insights into computational modeling within cognitive science and neuroscience.
- Learned from distinguished researchers in the field, including Prof. Josh Tenenbaum, Prof. Stephanie Piantadosi, Prof. Elizabeth Spelke, Prof. Sam Gershmann, and others.
- Successfully executed a modeling project utilizing Gaussian functions and various probabilistic techniques. Focused on modeling human intuitive physics responses when observing objects exiting occlusion, contrasting with their initial entry into occlusion.

J[AR]vis Project: AR-based Intelligent Agent Jan - May 2023

- Collaborated on an AR-based intelligent agent, enhancing cognitive architecture for seamless processing and integrated Azure CV for advanced interaction capabilities.
- Developed JETSON, a startup for summarizing real-time conversation content, improving the agent's architecture for long-term memory storage of user conversations.
- Optimized memory storage, submitted funding applications to investors, and provided access to the codebase via GitHub.
- Focused on dense-captioning, real-time ideation, and architecture enhancements.
- Received $ 300k startup funding from MiraclePlus for future development
- Github link: https://github.com/harvrd/jarvis-cognitive-architecture/blob/main/agent.py

@Macalester:

Reinforcement Learning Project: Tower of Hanoi April 2021 - May 2021

- Create the problem object named "Hanoi" that generates the states of the problem with recursive functions
- Create the agent object with domains of actions and define the rewards
- Use dynamic programming to implement the value iteration and Q-Learning algorithm
- Successfully trained the agent to solve the Tower of Hanoi problem with the optimal steps, and the results evaluations showed decreasing and converged root-mean-square error.

Twin Cities Airbnb Data Analysis: How to choose a suitable house April - May 2021

- Intended for international students to make the most economical choices of Airbnb housing in the Twin Cities area
- Created a series of interactive graphics using D3.js and Javascript to visualize the features of housing
- Accomplished the works of exploratory data analysis and storytelling
- Made the project fully accessible to all kinds of audiences, including color-blind and deaf
- Led the overarching project design and brainstorming

Stair Climbing Robot Carrier Simulation April 2022 - May 2022

- Built an eight-legged robot carrier that can climb stairs and a simulated environment using Webot
- Control the robot using the Finite State Machine model and code with Python
- Wrote a paper analyzing the application and the future improvement of the robot carrier

Research Assistant with Prof. Lisa Naples May - August 2021

- Characterization of Rectifiable Measures that are Carried by Lipschitz Graphs
- Formulating proofs for necessary lemmas and necessary/sufficient conditions and programming the characterization algorithm in Python.

Teaching Assistant of Department of Math, Statistics and Computer Science Feb 2019 - May 2022

(Intro to Statistical Modeling (Three Semesters), Algorithms(One Semester), Differential Equations(Two Semester))

CONFERENCES PRESENTATIONS

MAA-NCS Mathematical Association of America Fall Meeting, North Central Section Oct 2021

Midstate Consortium Undergraduate Research Symposium Nov 2021

JMM Joint Mathematical Meetings 2022 April 6 - 9, 2022

PUBLICATIONS

- (2023). MMToM-QA: Multimodal Theory of Mind Question Answering. Submitted to The Twelfth International Conference on Learning Representations (12th ICLR, in review), and FDMD@NeurIPS 2023 (accepted)

OTHER EXPERIENCES

- Google CSRMP (Computer Science Research Mentorship Program) 2023 Alumni