Emily Bunnapradist

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EDUCATION

Stanford University **Palo Alto, CA**

M.S. in Computer Science, concentration in Artificial Intelligence *Sept 2023 – Dec 2024*

B.S. in Mathematics & Symbolic Systems, concentration in Neuroscience *Sept 2020 – June 2024*

Study Abroad at Oxford University, Advanced Philosophy of Mind *Sept 2023 – Dec 2023*

RESEARCH

Mamba under a Microscope **Mar 2024 – Present**

Affiliated with the Stanford NLP Group, advised by Profs. Chris Manning and Chris Potts *Paper in Progress, Poster*

- Interpreting the representations of state-space models (SSM) for language modeling by performing ablations on Mamba.
- Characterizing memory of different models (RNNs, Transformers, SSMs) on synthetic tasks and language modeling.

Scaled-Up Social Learning **June 2023 – Sept 2023**

Affiliated with the Stanford AI Lab (CoCoLab), advised by Prof. Noah Goodman *Poster*

- Implemented RL algorithms to model cultural ratcheting & optimal decision-making over multiple generations and knowledge channels to answer how population size affects decision making and data transmission.
- Designed, developed and piloted a human experiment to corroborate modeling findings using Dallinger and Javascript.

Stanford Artificial Retina Project **Sept 2022 – Sept 2023**

Affiliated with the Stanford School of Medicine (Chichilnisky Lab), advised by Prof. E.J. Chichilnisky *Github Repo*

- Contributed to the Stanford Artificial Retina Project, a research initiative which aims to develop an epiretinal implant that reproduces high-fidelity vision for blind people affected by incurable retinal disease with a novel electronic device.
- Collaborated with the Software team to develop a GUI to analyze compressed neural data recordings in real time.

Modeling of Cortical Network Dynamics **May 2022 – August 2022**

Affiliated with the NYU Courant Institute of Applied Mathematics, advised by Dr. Lai-Sang Young *Presentation*

- Modeled cortical network dynamics with LSTMs to predict multiple firing events from high-dimensional neural data.

TECHNICAL PROJECTS

Interchange Interventions in Vision Models **Mar 2024 – Jun 2024**

CS 231N: Deep Learning for Computer Vision Final Project, with Profs. Eshan Adeli and Fei-Fei Li *Paper, Poster*

- Utilizing interpretability methods to determine which visual features are most relevant in image classification.

Investigating Internal Representations of Garden Path Sentences in LLMs **Mar 2023 – Jun 2023**

CS 224U: Natural Language Understanding Final Project, with Prof. Chris Potts *Paper*

- Comparative analysis of BERT and GPT-2's ability to understand garden path sentences to better understand how bidirectionality of a LLM affects comprehension and parsing of complex sentences.

Reinforcing Attachment: An RL Exploration **Mar 2023 – Jun 2023**

PSYCH 240A: Curiosity in Artificial Intelligence Final Project, with Prof. Nick Haber *Paper, Github Repo*

- Used the Minigrid environment to model attachment as a RL exploration.

Are LLMs Smarter than a 5th Grader? Mathematical Cognition in LLMs **Jan 2023 – Mar 2023**

PSYCH 209: Neural Network Models of Cognition Final Project, with Prof. Jay Mcclelland *Paper*

- Analyzed the ability of GPT-3.5 to perform and, importantly, explain novel mathematical operations.

HONORS & AWARDS

Stanford Award of Excellence Recipient **Jun 2024**

Designed to recognize the top 10% of the class for their impact on the university. *More Info*

Google CS Research Mentorship Program (CSRMP) Award Recipient **Sept 2023**

Designed to support the pursuit of computing research for students from historically marginalized groups. *More Info*

TEACHING & EXTRACURRICULAR

CS 224V: Conversational Virtual Assistants with Deep Learning TA **Sept 2024 – Dec 2024**
Mentoring research projects on applying LLMs as knowledge workers in various domains. *Course Website*

CS 25: Transformers United Co-Instructor **Mar 2024 – Jun 2024**
Lectured and invited interesting speakers to discuss their research on Transformers. *Course Website*

CS 181: Computers, Ethics, and Public Policy TA **Mar 2024 – Jun 2024**
Instilled important ethical principles, argumentative writing skills, and mentored real-world projects. *Course Website*

MATH 51: Linear Algebra, MVC, and Modern Applications Grader **Sept 2021 – Mar 2024**
Graded and prepared course materials for over 500 students quarterly. *Course Website*

CS 184: Bridging Policy and Tech Through Design TA **Mar 2022 – Jun 2022**
Designed and oversaw projects with partner organizations that bridged public policy and technology. *Course Syllabus*

ENGR 2A: Developing your Leadership Toolkit TA **Sept 2021 – Dec 2021**
Created resources and located opportunities for first-year underrepresented students in engineering.

Stanford Summer Engineering Academy Leader **June 2021 – December 2021**
Mentored 70+ first-years from from marginalized communities on navigating engineering. *Website*