Andy Liu

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EDUCATION

Language Technologies Institute, Carnegie Mellon University   *August 2023 –*
- Ph.D. Student in Language and Information Technology

Harvey Mudd College, Claremont, CA   *August 2019 – May 2023*
- Joint B.S. in Computer Science and Mathematics; Concentration in Science, Technology, and Society
- Relevant Coursework: Natural Language Processing, Artificial Intelligence, Machine Learning with Neural Signal, Computer Vision, Minds and Machines, Philosophy of Mind, Philosophy of Technology, Technology and International Politics, Language Acquisition, Introduction to Cognitive Science

RESEARCH EXPERIENCE

Language Technologies Institute, Carnegie Mellon University   **Pittsburgh, PA**
Research Intern, Neulab   *Summer 2022*
Advisors: Graham Neubig, Yonatan Bisk
- Extended computational models of language acquisition using reinforcement learning-based language learning agents implemented in PyTorch.
- Studied the influences of theory of mind modeling and environmental pressures on language acquisition through this computational framework, finding fluency and performance improvements from using both.

Harvey Mudd College   **Claremont, CA**
Student Researcher, Lab for Cognition and Attention over Time and Space   *January 2022 –*
Advisor: Calden Wloka
- Fine-tuned Python computer vision models for action recognition on 3D video input.
- Used network visualization techniques such as GradCAM to analyze neural network attention.
- Analyzed cases where models generated incorrect outcomes on modified input data and drew parallels to human behavior in similar contexts.

Harvey Mudd College   **Claremont, CA**
Student Researcher, Nonlinear & Complex Systems Research Group   *January 2021 –*
Advisor: Heather Zinn Brooks
- Extended existing continuous models of opinion dynamics on a social network to consider cases where agents have different underlying belief systems.
- Wrote simulations in Julia to simulate the dynamics of opinion evolution on social networks.

PUBLICATIONS

- *[Accepted to ICLR 2023]* **Liu A**, Zhu H, Liu E, Bisk Y, Neubig G. "Computational Language Acquisition with Theory of Mind".
  - Studied the impacts of computational theory of mind and more difficult training environments on language learning models' performance in an image referential game.
- *[Under Preparation]* **Liu A**, Zinn Brooks H, "Heterogeneous Topic Interdependencies in Friedkin-Johnsen Models of Opinion Dynamics".
  - Extended a model of opinion dynamics to include agents with different underlying beliefs in how various topics are correlated, then proved consensus and convergence results on the resulting model.

INDUSTRY EXPERIENCE

eBay – Harvey Mudd College   **Claremont, CA**
Clinic Team Project Member   *August 2022 –*
- Working on student-run collaboration with eBay for a major capstone project.
- Using natural language processing to analyze member-to-member (M2M) messaging on eBay.
- Developing clustering and sentiment analysis techniques in Python to predict consumer outcomes.

FACEBOOK   Menlo Park, CA
Software Engineering Intern   *May 2021 – August 2021*
- Implemented back-end features in Python and PHP to increase personalization of Facebook story duration, which led to a projected increase of 100 million new daily views in testing.
- Wrote and maintained supporting data pipelines in SQL to handle 8 billion daily records.
- Designed, implemented, and tuned neural networks to predict whether increased story duration would lead to greater engagement, then integrated models into production code.

TEACHING EXPERIENCE

Harvey Mudd College   Claremont, CA
Computer Science Teaching Assistant   *January 2021 –*
- Tutored students and graded assignments for the Computer Science Department. Courses worked for include Natural Language Processing (Fall 2022) and Principles of Computer Science (Spring 2021).

PROJECTS

p-Interact   **Harvey Mudd College**
Pomona AI (Student Organization)   *September 2021 – May 2022*
- Used the InstructGPT API to create a human-computer system to generate interactive fiction stories, such as Choose Your Own Adventures
- Designed prompts to keep track of the state of a story's characters and settings to maintain coherency
- Evaluated system and tuned hyperparameters using a cosine distance-based metric to maximize long-term story cohesion

[Rating Regional Reviews](#)   **Harvey Mudd College**
Natural Language Processing, CS159   *January 2022 – May 2022*
- Studied the robustness of sentiment analysis models to differences in regional dialects by comparing performance metrics on sets of Yelp reviews from different geographical regions

AWARDS AND FELLOWSHIPS

Google CS Research Mentorship Program   *February 2022 – May 2022*
- Research mentorship program that supports students from historically marginalized groups in computing research careers through mentorship and networking.

Cambridge AI Safety Fundamentals Program   *January 2022 – April 2022*
- Fellowship program that introduced participants to safety risks of artificial intelligence through weekly group meetings with a facilitator, as well as networking.

Harvey S. Mudd Merit Award   *May 2019*
- Merit scholarship awarded annually by Harvey Mudd College to incoming first-year students who demonstrate superior academic achievement and ability to contribute to the College community.

Lockheed Martin STEM Scholarship   *May 2019*
- Competitive annual merit scholarship awarded to 200 recipients studying engineering or computer science at a 4-year college or university.