Alicia Liu

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EDUCATION

The Western Academy of Beijing   Beijing, China
International Baccalaureate Diploma Programme   June 2020
Honors: Brandeis Book Award 2019, Valedictorian 2020 (1/150)

The University of Chicago   Chicago, IL
B.S. in Computer Science with a Specialization in Machine Learning   June 2024
B.A in Philosophy   June 2024
GPA: 3.7/4.0

GRANTS & AWARDS

2024 TechFoundation-Harvard Medical School Research Grant ($5,000) (declined)
2023 University of Chicago Advanced Scholars Research Grant ($5,000)
2021 University of Chicago Jeff Metcalf Award ($8,000)
2020 University of Toronto President's Scholars of Excellence Program ($15,000) (declined)

RESEARCH EXPERIENCE

Computational Affective Social Neuroscience Lab, **University of Chicago**   Chicago, IL
Research Assistant, *Advisor:* ***Dr. Yuan Chang Leong***   May 2023 – Present

Project 1: Individual Differences in Motivational Influences on Perceptual Judgements

- Investigated individual differences in personality and mood disorders in motivational and perception bias through behavorial experimentation and computational modelling
- Designed the experimental task, including structuring the block-based image categorization tasks, adjusting rewards/penalties to manipulate motivational bias, and writing task instructions
- Coded multiple versions of online image categorization cognitive task using JsPsych (HTML, JavaScript, CSS) on Cognition.run. Deployed task to 500+ subjects on Prolific
- Recruited and conducted consent meetings with participants; independently administered clinical questionnaires (PHQ, GAD, BIS/BAS) and cognitive tasks to 50 subjects in 1 hour sessions
- Maintained documentation for experimental protocol, create guidelines for data quality checks and performed quantitative quality control for data
- Pre-processed, visualized and analyzed behavioral data in RStudio; applied Hierarchical Drift Diffusion Modelling (MCMC) to model and predict decision-making through reaction time data

Project 2: LLM-based negative autobiographical memory editing (in progress)

- Perform literature review of chatbot and LLM usage in augmenting and improving mental health, creativity, productivity, and social interactions & communication
- Design experimental paradigm to investigate whether LLM can perform text-based cognitive re-appraisal and reframe negative autobiographical memories; draft and submit and IRB
- Code chatroom website using HTML/JavaScript/CSS for participant use, integrate with OpenAI
- Fine-tune and prompt tune LLMs (GPT3 and GPT4) on human language to perform cognitive reappraisal

Project 3: Individual Differences in Neural Event Segmentation (in progress)

- Leading new independent research project to analyze individual differences in event segmentation between healthy and anxious individuals across a naturalistic fMRI dataset of individuals 550 individuals
- Clean and pre-processing imaging data using NiLearn, and NiBabel and FSL using statistical methods such as hyperalignment and shared response models
- Apply machine learning models such as Hidden-Markov Models and Greedy State Boundary Search in Linux HPC environment to perform event segmentation of fMRI data

Human Genome Sequencing and Variant Analysis   Chicago, IL

Student Researcher at UChicago

- Designed and implemented dynamic programing algorithms in RStudio to perform genome alignment, identified genetic variants using Bayesian statistics models and annotated data using ANNOVAR toolbox
- Authored a 16-page research report on the mutations found through genome alignment, reported on the effiency of algorithms and statistical techiques in precision medicine

Social Sciences Division, University of Chicago   Chicago, IL

Research Assistant, *Adivsor:* **Dr. Jongyoon Baik**   May 2021 – June 2022

- Analyzed 2000+ media reports of administrative lawsuits in China to assist in the development of an administrative lawsuits dataset to support research on administrative lawsuits systems
- Developed a systematic workflow of organizing and categorizing media reports based on analysis
- Utilized RStudio to clean and visualize data; assisted in the testing of a Python NLP package for text-based quantitative analysis in the social science

Perry World House, University of Pennsylvania   Chicago, IL

Remote Research Assistant, *Adivsor:* **Dr. Joshua Byun**   Aug 2022 – September 2022

- Translated, coded, and qualitatively analyzed the results of a nuclear weapons attitude survey administered to 3,748 Chinese citizens

MANUSCRIPT IN PREPARATION

Kim, H., **Liu, A.**, & Leong, Y.C. Desirability biases perceptual decision making in aversive context.

CONFERENCE PRESENTATIONS

"Information Release as a Form of Control: Open Government Information Request in China". Poster talk given at *Midwest Political Science Association Conference, Chicago, 2022*.

PROFESSIONAL EXPERIENCE

immersionED   Chicago, IL
Software Engineering Intern   June 2022 – Sept 2022

- Developed a game software from beginning to end with senior game developer and two other interns to be deployed in K-12 classrooms. Gained experience in scripting, Perforce, C++, and testing/debugging to ensure gameplay goals were met.
- Implemented & designed game mechanics based on insights from educational psychology and game-based learning

TECHNICAL SKILLS

Programming: Python, RStudio, C/C++, HTML/CSS/JavaScript, Rust, SQL, MATLAB, Bash/Unix
Neuroscience & Psychology:
    Software: JsPsych, Cognition.run, Prolific, Qualtrics
    Hardware: SR Research Eyelink 1000/Portable Duo eyetracker
Other tools: Git/SVN/Perforce, Jupyter/Google Collab, HPC, Docker, Unity, Unreal Engine, Occulus
Languages: English (native), Mandarin Chinese (native)

SELECTED COURSEWORK

CMSC 25300 Mathematics of Machine Learning
CMSC 25000 Computer Vision
CMSC 23700 Scientific Visualization

CSMC 20300 Human-Computer Interaction
CMSC 21800 Data Science
PSYC 26000 Social Psychology

REFERENCES

Dr. Yuan Chang Leong
Assistant Professor in Psychology, University of Chicago
ycleong@uchicago.edu

Dr. Hannah Kim
Post-Doc in Psychology, University of Chicago
kimhannah@uchicago.edu

Dr. Jongyoon Baik
Assistant Professor in Political Science, Chinese University of Hong Kong
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