LILA (SHUCHEN) LIU

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EDUCATION

Beijing Normal University (BNU) — Sep 2019 - Jun 2023
B.S. in Psychology, Department of Psychology — GPA: 90.05/100

University of California(UC), Berkeley — Jan 2022 - Jun 2022
Visiting Student — GPA: 3.93/4.00

University of Minnesota (UMN), Twin Cities — Sep 2023 - Apr 2024
Graduate Researcher, Department of Psychology — GPA: 3.88/4.00

PUBLICATIONS & PREPRINTS

[2] **Liu, S.**, Zhou, K. (Submitted). Tunnel Vision and Beyond: Unveiling Implicit Spatial Learning with the "Mouse-Eye" Approach.

[1] **Liu, S.** (Submitted). Serial Dependence in the Perception of Looming Stimuli. Preprint on ***PsyArXiv***: https://doi.org/10.31219/osf.io/w7vqs

POSTERS & PRESENTATIONS

[3] **S. Liu**, S. Engel. (2024, May). *Observers Can Learn to Immediately Correct Spatial Distortions Produced by Prescription Lenses.* Poster presented at Vision Sciences Society 2024.

[2] X. Wu, **S. Liu**, C. Liu. (2023, March). *Attention Modulation of Face-Selective Cortical Responses During Dynamic Degradation of Double-Exposure.* Poster presented at BNU Undergraduate Research Symposium 2023.

[1] Y. Jin, **S. Liu**, L. Yan, Q. Gao, Y. Zhou. (2022, November). *Altered Social Learning from Losses in Major Depressive Disorder: Insights from Reinforcement Learning Models in the Trust Game.* Talk given at The 4th Annual Academic Conference of the Decision Psychology Division, Chinese Psychological Society..

RESEARCH EXPERIENCE

Visual Perception & Attention Lab, Beijing Normal University — Apr 2023 - Sep 2024
Research Assistant. Advisor: Dr.Ke Zhou — Beijing, CN

Contextual Cueing Effect in Different Viewing Conditions Using "Mouse-Eye" Paradigm [pipeline]

- Led a comprehensive study with gaze-contingent displays aimed to investigate the contribution of peripheral vision in implicitly guided spatial attention.
- Designed and implemented a series of PsychoPy-based wrapper programs to fully automate end-to-end studies, from conducting online behavioral experiments to generating visualized core metrics.
- Utilized the 'Mouse-as-Eye' method, an innovative alternative to traditional gaze-contingent eye tracking, to simulate various types of scotomas and provide an effective solution for scalable online experimentation.
- Peripheral vision loss impaired the learning of spatial contexts under tunnel view search, but facilitation became manifest when the display was made fully visible.

Vision & Imaging Lab, University of Minneosta, Twin Cities — Sep 2023 - Apr 2024
Research Assistant. Advisor: Dr.Stephen Engel — Minneapolis, US

Visual Mode Switching: Repeated Adaptation to Spatial Distortions by Meridional-Size Lens [code]

- Investigated long-term adaptation to optical distortions caused by astigmatism lenses and explored whether observers can learn to switch to a 'skew mode' when such configurations are repeatedly encountered.
- Developed a Matlab-based rectangle adjustment task using the cancellation method to quantify individual spatial distortions resulting from wearing astigmatism spectacles, and mesured idiosyncratic visual space distortion.
- Coordinated participants wearing cylindrical lenses that magnified images along a 45-degree axis during two 2-hour sessions on each of five consecutive days, along with collecting subjective reports.

Emotion Cognition Neuroscience Lab, IDG/McGovern Institute for Brain — Sep 2022 - Mar 2023
Research Intern. Advisor: Dr.Chao Liu — Beijing, CN

Attention Modulation of Face-Selective Cortical Responses to Degraded Face-House Images [code]

- Implemented a phase-shuffled double-exposure flow (JavaScript) to investigate attention modulation on hemodynamic signals, and performed fMRI brain scanning with subjects.

○ Analyzed and interpreted fMRI data using AFNI in FreeSurfer.

Perception & Action Lab, University of California, Berkeley　　　Feb 2022 - Sep 2022
Research Assistant. Supervisor: Dr. David Whitney　　　*Berkeley, US*
Serial Dependence in Radiologists: Perception of Mammograms Using Naturalistic Stimuli [code]
  ○ Examined serial dependence in medical image perception and diagnostic errors among radiologists using GAN-generated mammogram stimuli.
  ○ Preprocessed raw data and assisted in feature tuning and temporal tuning analyses on response errors in Python.
  ○ Serial dependence biases perceptual judgments of realistic medical images up to 10 seconds in the past.

Social Cognition & Neuroimaging Lab, Chinese Academy of Sciences　　　Aug 2020 - Sep 2021
Reserach Intern. Advisor: Dr.Yuan Zhou　　　*Beijing, CN*
The Dynamic of Interpersonal Trust: Evidence from the Repeated Trust Game [code]
  ○ Studied how personal experience and prior reputation influenced investment decisions in the trust game across different ages, and explored the potential link between personality traits and strategies used.
  ○ Proposed and designed an enhanced paradigm based on the Repeated Trust Game, with adjustable parameters such as agents' reputation levels and actual trustworthiness.
  ○ Implemented the entire experiment using E-Prime, launched it online for data collection, and fed the behavioral data into several candidate reinforcement learning models for comparison.

FUNDED PROJECTS

BrainCognit: A Region-Aware Contrastive Learning Framework for Functional MRI Analysis [code]
AWS AI & ML Scholarship. Supervisor: Dr.Suyuan Chen　　　*Apr 2024 - Present*
  ○ Applied a region-aware graph attention mechanism that leverages the functional specificity, connectivity, and consistency of brain regions across individuals ROIs.
  ○ Introduced a transformer-based encoder-decoder architecture with contrastive learning to capture temporal dynamics from fMRI signals.

3D Percept Fusion: Exploring Depth Perception and Realism via Visual Cues Manipulation in XR [code]
XR Bootcamp Scholarship　　　*Feb 2024 - Present*
  ○ Enhanced a custom experimental framework for the Quest 3 in Unity (C#) and leveraged a VR reaching task to assess perceived depth.
  ○ Manipulated visual cues including binocular disparity, focus, and texture gradients to explore their integration in enhancing 3D perception in virtual reality.

HONORS & AWARDS

- AWS AI & ML Scholarship　　　*Apr 2024*
- Elsevier Vision Research Travel Award　　　*Feb 2024*
- Department of Psychology Graduate Fellowship　　　*2023 - 2024*
- Undergraduate Research Symposium Poster Award　　　*Mar 2023*
- Cognitive Neuroscience Student Travel Award　　　*Jul 2021*
- First-Class Beijing Normal University Scholarship(Top 5% GPA)　　　*2020 - 2022*

SKILLS SUMMARY

○ **Programming Languages**:　　Matlab, R, Python (scikit-learn, Pandas, NumPy, SciPy, TensorFlow), JavaScript, C#
○ **Software & Analytical Tools**:　　PsychoPy, SPSS, Mplus, JASP, E-Prime, Qualtrics, Git
○ **Experimental Techniques**:　　fMRI, Eye tracker

TEACHING & LEADERSHIP

Instructor at Tencent Education　　　Online
Differential Geometry (note)　　　*May 2023 - Present*

Associate Tournament Directors of US Go Congress　　　Portland, OR, US
Assisted translation, videography and registration coordination　　　*July, 2024*

Teaching Assistant at BNU　　　Beijing, P.R.China
Matlab Technology in Psychology (code)　　　*Spring, 2021*

Co-Chairman of BNU Go Chess Club　　　Beijing, P.R.China
Organized Colloquiums on Informatical Analysis of Go　　　*Oct 2020 - May 2022*

Language Proficiency

- TOEFL 111:   Listening 27   Reading 30   Speaking 25   Writing 29
- GRE 332:   Verbal 164   Quant 168   Writing 4.0