SHI CHEN

Postdoctoral Scholar, UC Berkeley | Email: shichen@berkeley.edu | Google Scholar

EDUCATION

University of California, Berkeley 08/2023 - Present
Postdoctoral Scholar in Neuroscience
Advisor: Dr. Doris Tsao

University of Minnesota, Twin Cities 08/2018 - 06/2023
Ph.D. in Computer Science
Advisor: Dr. Qi (Catherine) Zhao

University of Minnesota, Twin Cities 08/2015 - 06/2017
M.S. in Computer Science

Wuhan University 09/2011 - 06/2015
B.S. in Computer Science

RESEARCH APPOINTMENTS

University of California, Berkeley 08/2023 – Present
Postdoctoral Scholar; advised by Doris Tsao

- Developing computational methods that leverage foundation models to uncover neural mechanisms using electrophysiological recordings, with a focus on bridging artificial and biological neural representations through unsupervised learning and generative modeling.
- Developing mechanistic interpretability approaches that factorize black-box model representations into interpretable units, enabling a systematic characterization of neural function within a unified framework.
- Investigating the neural mechanisms underlying episodic memory and spatial representation, using novel embodied VR tasks and Neuropixels recordings in the hippocampus, prefrontal cortex, and inferotemporal cortex of nonhuman primates.

University of Minnesota, Twin Cities 05/2017 - 06/2023
Graduate Research Assistant; advised by Catherine Zhao

- Led a series of interconnected research projects on human and machine attention spanning sequential decision-making, visual reasoning, and vision-language modeling. Collectively, these studies built a bidirectional bridge between human and computer vision, leveraging insights from biological vision to improve computational systems while applying advanced models to deepen our understanding of human visual perception.
- Developed deep learning methods for autism screening using visual behavioral data, with a focus on integrating data across multiple modalities and designing interpretable models for more transparent assessment.
- Investigated approaches to improving the computational efficiency of deep neural networks through analysis of feature representations and layer-wise architectural pruning.

Google Research 05/2022 - 08/2022
Research Intern; advised by Junfeng He

- Led the development of a personalized framework for predicting individual patterns of visual attention, published at CVPR 2023 and subsequently extended to capture broader diversity in human preferences.

Wuhan University 09/2013 - 04/2015
Undergraduate Research Assistant, Autonomous Driving Lab

- Contributed to the development of an advanced driver-assistance system incorporating pedestrian recognition and landmark detection. The resulting autonomous vehicle was exhibited at Auto China 2014.

PUBLICATIONS

*Equal contribution.

1. **Shi Chen**, Seoyoung Ahn, and Doris Y Tsao. Prototypes of the Mind: A Unified Framework for Probing the Visual Brain. Conference on Neural Information Processing Systems (NeurIPS), 2026.
2. **Shi Chen***, Nate Dolensek*, Shiry Ginosar, and Doris Y Tsao. Shared Neuro–Visual Latent for Brain Decoding and Discovery. Under submission, 2026.
3. Krithika Mohan*, **Shi Chen***, Jialiang Lu, and Doris Y Tsao. The Neural Code for Episodic Experience in the Primate Hippocampus. Under submission, 2026.
4. Yuelin Shi, Dasheng Bi, Janis K Hesse, Frank F Lanfranchi, **Shi Chen**, and Doris Y Tsao. Rapid concerted switching of the neural code in the inferotemporal cortex. Nature, 2026.
5. **Shi Chen**, Ming Jiang and Qi Zhao. Deep Learning to Interpret Autism Spectrum Disorder Behind the Camera. IEEE Transactions on Cognitive and Developmental Systems (TCDS), 2024.
6. Xianyu Chen, Jinhui Yang, **Shi Chen**, Louis Wang, Ming Jiang and Qi Zhao. Every Problem, Every Step, All In Focus: Learning to Solve Vision-Language Problems with Integrated Attention. IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI), 2024.
7. **Shi Chen**, Ming Jiang and Qi Zhao. What Do Deep Saliency Models Learn about Visual Attention? Conference on Neural Information Processing Systems (NeurIPS), 2023.
8. Yifeng Zhang, **Shi Chen** and Qi Zhao. Toward Multi-Granularity Decision-Making: Explicit Visual Reasoning with Hierarchical Knowledge. IEEE International Conference on Computer Vision (ICCV), 2023.
9. **Shi Chen** and Qi Zhao. Divide and Conquer: Answering Questions with Object Factorization and Compositional Reasoning. Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2023.
10. **Shi Chen**, Nachiappan Valliappan, Shaolei Shen, Xinyu Ye, Kai Kohlhoff and Junfeng He. Learning from Unique Perspectives: User-aware Saliency Modeling. Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2023.
11. **Shi Chen** and Qi Zhao. REX: Reasoning-aware and Grounded Explanation. Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2022.
12. Jinhui Yang*, Xianyu Chen*, Ming Jiang, **Shi Chen**, Louis Wang and Qi Zhao. VisualHow: Multimodal Problem Solving. Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2022.
13. **Shi Chen** and Qi Zhao. Attention to Action: Leveraging Attention for Object Navigation. British Machine Vision Conference (BMVC), 2021.
14. **Shi Chen***, Ming Jiang*, Jinhui Yang, and Qi Zhao. Attention in Reasoning: Dataset, Analysis, and Modeling. IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI), 2021.
15. **Shi Chen***, Ming Jiang*, Jinhui Yang, and Qi Zhao. AiR: Attention with Reasoning Capability. European Conference on Computer Vision (ECCV, oral), pp. 91–107, 2020.
16. Ming Jiang*, **Shi Chen***, Jinhui Yang, and Qi Zhao. Fantastic Answers and Where to Find Them: Immersive Question-directed Visual Attention. Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR), pp. 2977–2986, 2020.
17. **Shi Chen** and Qi Zhao. Attention-based Autism Spectrum Disorder Screening with Privileged Modality. IEEE International Conference on Computer Vision (ICCV), pp. 1181–1190, 2019.
18. **Shi Chen** and Qi Zhao. Shallowing Deep Networks: Layer-wise Pruning based on Feature Representations. IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI), vol. 41, no. 12, pp. 3048–3056, 2019.
19. **Shi Chen** and Qi Zhao. Boosted Attention: Leveraging Human Attention for Image Captioning. European Conference on Computer Vision (ECCV), pp. 72–88, 2018.

INVITED TALKS

- "Learning a Shared Latent Space between Foundation Models and the Brain", presented at the Simons Intelligence Workshop, 2026.
- "Attention with Reasoning Capability", presented at the European Conference on Computer Vision (ECCV), 2020.
- "Where to Look at: Visual Attention in Computer Vision and Mental Health", presented at the UMN department of computer science & engineering 50^{th} anniversary research exhibit, 2019.

- "Towards Efficient Deep Neural Networks", presented at UMN visual computing & AI seminar, 2018.

TEACHING EXPERIENCE

Teaching Assistant 02/2019 – 05/2022

Introduction to Machine Learning, Machine Learning Fundamentals, Algorithms and Data Structures

- Served as teaching assistant for two graduate machine learning courses across five semesters, including three as the sole TA. Provided in-depth instruction and supplementary lecture during office hours, developed lecture materials for the main course, and designed homework projects.
- Teaching assistant for an advanced undergraduate algorithms course of 80–100 students. Led bi-weekly recitation sessions, held weekly office hours, and graded technical reports.

Guest Lecturer Spring 2021; Fall 2022

Machine Learning Programming, Introduction to Deep Learning Models

- Invited as a guest lecturer for two courses within the graduate machine learning curriculum. Designed and taught lectures covering both theoretical foundations and hands-on implementation of machine learning algorithms and deep neural networks.

Research Mentoring

- Mentored three Ph.D. students at the UMN lab (Xianyu Chen, Yifeng Zhang, and Jinhui Yang), organized monthly salons for paper discussions and brainstorming, and guided them through problem formulation and model design.
- Advised and supervised multiple research projects, resulting in three co-authored publications at top-tier conferences and journals.

ACADEMIC SERVICE

Reviewer/Program Committee for Conferences:
CVPR (2019-2026); ICCV (2019-2025); ECCV (2018-2026); NeurIPS (2022-2026); AAAI (2020-2027); ICLR (2022-2027); ICML (2023-2024); WACV (2021-2026); AISTATS (2025-2027).

External Reviewer for Journals:
TPAMI (2021-Present); TNNLS (2019-Present); TMM (2021-Present); IJCV (2023-Present)