

# SHI CHEN

Email: chen4595@umn.edu

## EDUCATION

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**University of Minnesota, Twin Cities**

Sep. 2018 - Now

P.h.D in Computer Science (anticipated to graduate in 06/2023)

Advisor: Dr. Qi (Catherine) Zhao

**University of Minnesota, Twin Cities**

Sep. 2015 - Jun. 2017

M.S. in Computer Science

**Wuhan University**

Sep. 2011 - Jun. 2015

B.S. in Computer Science

## RESEARCH INTEREST

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Computer Vision, Machine Learning, Human Vision, Nature Language Processing

## PUBLICATION

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- Shi Chen and Qi Zhao. Divide and Conquer: Answering Questions with Object Factorization and Compositional Reasoning. In Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2023.
- Shi Chen, Nachiappan Valliappan, Shaolei Shen, Xinyu ye, Kai Kohlhoff and Junfeng He. Learning from Unique Perspectives: User-aware Saliency Modeling. In Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2023.
- Shi Chen and Qi Zhao. REX: Reasoning-aware and Grounded Explanation. In Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2022.
- Jinhui Yang\*, Xianyu Chen\*, Ming Jiang, Shi Chen, Louis Wang and Qi Zhao. VisualHow: Multimodal Problem Solving. In Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2022.
- Shi Chen and Qi Zhao. Attention to Action: Leveraging Attention for Object Navigation. In British Machine Vision Conference (BMVC), 2021.
- Shi Chen\*, Ming Jiang\*, Jinhui Yang, and Qi Zhao. Attention in Reasoning: Dataset, Analysis, and Modeling. In IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI), 2021.
- Shi Chen\*, Ming Jiang\*, Jinhui Yang, and Qi Zhao. AiR: Attention with Reasoning Capability. In European Conference on Computer Vision (ECCV), pp 91-107, 2020. (**Oral Paper, 2% acceptance rate**)
- Ming Jiang\*, Shi Chen\*, Jinhui Yang, and Qi Zhao. Fantastic Answers and Where to Find Them: Immersive Question-directed Visual Attention. In Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR), pp. 2977-2986, 2020.
- Shi Chen and Qi Zhao. Attention-based Autism Spectrum Disorder Screening with Privileged Modality. In IEEE International Conference on Computer Vision (ICCV), pp. 1181-1190, 2019.
- Shi Chen and Qi Zhao. Shallowing Deep Networks: Layer-wise Pruning based on Feature Representations. In IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI), vol. 41, no. 12, pp. 3048-3056, 2019.
- Shi Chen and Qi Zhao. Boosted Attention: Leveraging Human Attention for Image Captioning. In European Conference on Computer Vision (ECCV), pp 72-88, 2018.

## TALK

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- “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<sup>th</sup> anniversary research exhibit, 2019.
- “Towards Efficient Deep Neural Networks”, presented at UMN visual computing & AI seminar, 2018.

## SERVICE

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### Reviewer:

CVPR (2019-2023); ICCV (2019-2023); ECCV (2018-2022); NeurIPS 2022; AAAI (2020-2023); ICLR (2022-2023); ICML 2023; WACV (2021-2023); TNNLS (2019-Now); TMM (2021-Now); IJCV (2023-Now).

## ACADEMIC EXPERIENCE

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### Visual Information Processing Lab, University of Minnesota

May. 2017 - Now

*Computer Vision, Machine Learning, Human Vision, Vision and Language*

- Proposed new methods for modeling visual attention throughout the continuous decision-making process.
- Designed and conducted human experiments to study the visual behavioral patterns during visual reasoning tasks with perspective and 360° immersive views.
- Designed a novel deep learning algorithm for interpretable and generalizable autism spectrum disorder screening with multi-modal visual behavioral data.
- Developed new methods that incorporate human attention with machine attention for enhanced multi-modal understanding.
- Designed a new family of multi-modal explanations for estimating machines’ visual reasoning capabilities.
- Developed a new method for reducing the computational overhead of deep neural networks with feature diagnosis and layer-wise pruning.
- Developed visual navigation agents that generate action planning based on attention patterns.

### Autonomous Driving Lab, Wuhan University

Sept. 2013 - Apr. 2015

*Computer Vision in Intelligent Transportation System*

- Built an advanced driver assistance system with pedestrian recognition and lane departure warning. The self-driving car equipped with the system is displayed at Auto China 2014.
- Designed a new road marking recognition system based on geometric features.

## INDUSTRIAL EXPERIENCE

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### Google Research

May. 2022 - Aug. 2022

- Research Intern. Mentor: Junfeng He

## TEACHING EXPERIENCE

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### Guest Lecturer

- Machine Learning Fundamentals, Fall 2022.

- Introduction to Machine Learning, Spring 2021.

#### **Teaching Assistant**

- Machine Learning Fundamentals, Fall 2021/Spring 2022.
- Introduction to Machine Learning, Fall 2019/Fall 2020/Spring 2021.
- Algorithms and Data Structures. Spring, 2019.

#### **SKILL**

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**Programming Language:** Python, Matlab, Linux shell

**Tools:** Pytorch, Tensorflow, Keras, Opencv, Unix/Linux, Git, Atom, Scikit-Learn.