

# SIJIA CHEN

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## RESEARCH INTERESTS

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My research is driven by the goal of developing artificial intelligence (AI) frameworks that effectively and efficiently *perceive* and *reason* in real-world scenarios. My primary interests lie in the areas of **distributed systems**, **multimodal machine learning**, **decision-making**, and **networking**. Specifically, my past and ongoing work has covered topics such as *multimodal federated learning*, *reasoning and planning with large models*, and *visual grounding*. Building on these achievements, my aim is to further explore decentralized decision-making systems of foundation models, next-generation reasoning frameworks for multimodal large models, and, more importantly, the broad applications of these techniques to sciences and engineering.

## EDUCATION

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**Ph.D. in Electrical and Computer Engineering**, University of Toronto, December, 2024  
 Dissertation: Toward Reliable Problem Solving with Pre-trained Large Language Models  
 Advisor: Prof. Baochun Li, Department of Electrical and Computer Engineering; *IEEE Fellow*,  
*Fellow of the Engineering Institute of Canada*, *Fellow of the Canadian Academy of Engineering*

**M.S. in Information and Communication Engineering**, Xidian University, June, 2018  
 Dissertation: Research on multimodal data modeling and retrieval for common space learning  
 Advisor: Prof. Bin Song, Department of Information and Communication Engineering; *IEEE Senior Member*, *Director of Information Network Laboratory of Xidian Hangzhou Research Institute*

**B.A. in Information and Communication Engineering**, Xidian University, June, 2015

## HONORS AND FELLOWSHIPS

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<b>Doctoral Completion Award (DCA)</b> , University of Toronto	Toronto, Canada
<b>School of Graduate Studies Conference Grant</b> , University of Toronto	Toronto, Canada
<b>Edward S. Rogers Sr. Graduate Scholarships</b> , University of Toronto	Toronto, Canada
<b>National Scholarship</b> , Xidian University	Xian, Chain
<b>Outstanding graduates</b> , Xidian University	Xian, Chain
<b>Second Class Scholarship</b> , Xidian University	Xian, Chain
<b>Third Class Scholarship</b> , Xidian University	Xian, Chain

## PUBLICATIONS

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### Journal Papers

1. **Sijia Chen**, Bin Song, Xiaojiang Du, Nadra Guizani. “Structured Bayesian Compression for Deep Models in Mobile-enabled Devices for Connected Healthcare,” in *IEEE Network*, 2020.
2. **Sijia Chen**, Bin Song, Luhai Fan, Xiaojiang Du, Mohsen Guizani. “Multi-modal Data Semantic Localization with Relationship Dependencies for Efficient Signal Processing in EH CRNs,” in *IEEE Transactions on Cognitive Communications and Networking*, 2019.
3. **Sijia Chen**, Bin Song, Jie Guo, Yanling Zhang, Xiaojiang Du, Mohsen Guizani. “FPAN: Fine-grained and Progressive Attention Localization Network for Data Retrieval,” in *Computer networks*, 2018.
4. **Sijia Chen**, Bin Song, Jie Guo. “Attention Alignment Multimodal LSTM for Fine-gained Common Space Learning,” in *IEEE access*, 2018.

### Conference Papers

1. **Sijia Chen**, Baochun Li. “Toward Adaptive Reasoning in Large Language Models with Thought Rollback,” in *International Conference on Machine Learning*, ICML 2024. [\[Code\]](#)

2. **Sijia Chen**, Baochun Li, Di Niu. “Boosting of Thoughts: Trial-and-Error Problem Solving with Large Language Models,” in *International Conference on Learning Representations*, ICLR 2024. [Code]
3. **Sijia Chen**, Ningxin Su, Baochun Li. “Calibre: Towards Fair and Accurate Personalized Federated Learning with Self-Supervised Learning,” in *International Conference on Distributed Computing Systems*, ICDCS 2024. [Code]
4. **Sijia Chen**, Ningxin Su, Baochun Li. “Relic: Federated Conditional Textual Inversion with Prototype Alignment,” in *International Symposium on Quality of Service*, IWQoS 2024. [Code]
5. **Sijia Chen**, Baochun Li. “Multi-modal Dynamic Graph Transformer for Visual Grounding,” in *IEEE Conference on Computer Vision and Pattern Recognition*, CVPR 2022. [Code]
6. **Sijia Chen**, Baochun Li. “Towards Optimal Multi-modal Federated Learning on non-IID Data with Hierarchical Gradient Blending,” in *IEEE Conference on Computer Communications*, INFOCOM 2022. [Code]
7. **Sijia Chen**, Bin Song, Jie Guo, Xiaojiang Du. “An Unbalanced Data Hybrid-Sampling Algorithm Based on Multi-Information Fusion,” in *IEEE Global Communications Conference*, GLOBECOM 2017.

### Submitted Papers and Papers Under Preparation

1. Ningxin Su, **Sijia Chen**, Baochun Li. “Towards Optimizing Distributed Machine Learning with Flow Dependencies,” submitted to *International Conference on Distributed Computing Systems*. [Code]
2. **Sijia Chen**, Baochun Li. “Language-Guided Diffusion Model for Visual Grounding,” in *Arxiv 2308.09599*, 2024. [Code]
3. **Sijia Chen**, Baochun Li. “Adaptive Regional Transformers for Progressive Phrase Localization,” under preparation and to be submitted, 2024. [Code]
4. **Sijia Chen**, Ningxin Su, Baochun Li. “Staple: Towards Reliable Problem Solving with Large Language Models via Plan Optimization and Tree Search,” submitted to *Association for Computational Linguistics*(ACL 2025). [Code]
5. **Sijia Chen**, Haojian Zheng, Bin Song. “Augmenting Reasoning of Large Language Models with Latent Plan Distillation,” *International Conference on Distributed Computing Systems*(ICML 2025), under preparation and to be submitted. [Code]
6. **Sijia Chen**. “Large Language Models can Self-correct When Ignoring Invalid Tokens,” submitted to *Association for Computational Linguistics*(ACL 2025). [Code]
7. **Sijia Chen**. “Clibrate, Attend, and Reasoning: Reliable Problem-Solving of Large Visual Models with Step-wise Adaptive Visual Attention,” *International Conference on Computer Vision*(ICCV 2025), under preparation and to be submitted.
8. **Sijia Chen**. “A New Theoretical Analysis on the Self-correctness of Large Language Models,” *Conference on Neural Information Processing Systems*(NeurIPS 2026), under preparation and to be submitted.

### PROFESSIONAL EXPERIENCE

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<b>Research Assistant</b>	June, 2018 — June, 2019
<b>Chau Yuen’s Lab</b> , Singapore University of Technology and Design (SUTD),	Singapore
Associate Professor <b>Yuen Chau</b> with the project <i>Bayesian machine learning in Communication Engineering</i>	

### TEACHING EXPERIENCE

#### Mentored Students

Xitong Zhang	December 2022 - February 2022
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Served as a mentor and supervisor for a research project on multimodal federated learning, culminating in a research paper published at IEEE INFOCOM 2022.

**Jason Wang**

May 2024 - August 2024

Provided mentorship and supervisory guidance over three months, leading to a research paper on optimizing bandwidth allocation for training large machine learning models with flow dependencies across wide-area inter-datacenter networks.

**Haojian Zheng**

December 2024 - February 2025

Provided mentorship and supervision for a three-month research project, culminating in an ICML submission exploring the latent plan Distillation to enhance the reasoning capabilities of large language models.

**PROFESSIONAL SERVICE**

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**Journal Reviewers**

*IEEE Transactions on Dependable and Secure Computing*

*IEEE Transactions on Big Data*

*IEEE Transactions on Computational Social Systems* *IEEE Transactions on Cloud Computing*

*IEEE Transactions on Cloud Computing*

*IEEE Transactions on Network Science and Engineering*

**Conference Reviewers**

*IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2023,2024,2025

*International Conference on Distributed Computing Systems (ICML)*, 2025

*Conference on Neural Information Processing Systems (NeurIPS)*, 2024

*International Conference on Learning Representations (ICLR)*, 2025

*IEEE Conference on Computer Communications (INFOCOM)*, 2022,2023,2024,2025

*International Conference on Distributed Computing Systems (ICDCS)*, 2023

*ACM International Conference on Multimedia (ACMMM)*, 2023