

# Jie Gao

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**Malone Postdoctoral Fellow, Johns Hopkins University**

Department of Computer Science

Malone Center for Engineering in Healthcare & Center for Language and Speech Processing

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## Research Interests

My research interests include **human-AI collaboration, responsible and trustworthy AI, human aspects of software engineering and computational social science**. In this AI era, a key challenge is the ever-growing volume of large, complex, and unstructured data, such as text, code, and images, produced by individuals, organizations, and society. Empowering humans to understand and make meaningful use of such data remains a significant problem. To address this, I leverage AI techniques, particularly large language models (LLMs), with methodologies from social science to design human–AI collaborative systems. To ensure these systems are usable and adaptable in real-world settings, I apply empirical, human-centered methods including interviews and user studies. These approaches help me understand the practices of professionals such as software engineers, designers, and researchers, and identify key human-centered design principles. My long-term goal is to enable individuals and teams to perform tasks beyond their original capabilities by creating the next generation of human–AI systems.

## Work Experience

- 2025.03–Present **Johns Hopkins University**, Baltimore, MD, USA  
Malone Postdoctoral Fellow, Department of Computer Science & Malone Center for Engineering in Healthcare & Center for Language and Speech Processing  
*Advisors:* *Mark Dredze, Ziang Xiao, Chien-Ming Huang*
- 2024.02–2025.02 **Singapore-MIT Alliance for Research and Technology (SMART)**, Singapore  
Postdoctoral Associate, Mens Manus Machina (M3S) team  
*Advisor:* *Thomas W. Malone*

## Education & Experience

- 2019.09–2024.01 **Singapore University of Technology and Design**, Singapore  
Ph.D. in Information Systems Technology and Design  
PhD Thesis: Tool Support for Human-AI Collaboration in Qualitative Data Analysis   
*Advisor:* *Simon Perrault*
- 2023.01–2023.07 **University of Notre Dame**, Indiana, USA  
Visiting Ph.D. Student  
*Host Advisor:* *Toby Jia-jun Li*
- 2022.06–2022.12 **National University of Singapore**, Singapore  
Visiting Ph.D. Student  
*Host Advisor:* *Shengdong Zhao*
- 2017.09–2019.06 **Zhejiang University**, Hangzhou, China  
M.Eng. in Software Engineering (Information Product Design)
- 2013.09–2017.06 **Shanghai University**, Shanghai, China  
B.Eng. in Digital Media Technology

## Ongoing Work

- 2025 **Efficiency with Rigor! A Trustworthy LLM-powered Workflow for Qualitative Data Analysis**    
**Jie Gao**, Zhiyao Shu, Shun Yi Yeo, Alok Prakash, Chien-Ming Huang, Mark Dredze, Ziang Xiao  
<https://arxiv.org/abs/2501.00775>
- 2025 **Evaluation Framework for LLM-assisted Qualitative Data Analysis**  
**Jie Gao**, Mian Zhong, Jonathan Ivey, Chien-Ming Huang, Ziang Xiao, Mark Dredze  
*In preparation, target CSCW conference*

- 2025 Not just Prompt Engineering! A Taxonomy for Human-LLM Interaction Modes   [manuscript](#)  [Website](#)  
Jie Gao, Thomas Malone, et al.  
*In preparation*, target TOCHI2026
- 2025 Using Qualitative Data Analysis to Perform Error Analysis  
Jie Gao, Rongkun Zhou, Zhuoran Lu, Ziang Xiao  
*In preparation*
- 2025 Multi-agent Subjective Qualitative Data Analysis  
Haonan Wang, Jie Gao, Ziang Xiao.  
*In preparation*
- 2025 ExpertEase: Multi-agent Human Implicit Knowledge Extraction  
Zhiyao Shu, Alok Prakash, Jie Gao#. #Advising Author  
*In preparation*

## Publications

- 2026 Understanding Codebase like a Professional! Human–AI Collaboration for Code Comprehension  [arXiv](#)  [Tool Demo Video](#)  
Jie Gao, Yue Xue, Xiaofei Xie, SoeMin Thant, Erika Lee, Bowen Xu  
*The 34th IEEE/ACM International Conference on Program Comprehension (ICPC 2026)*
- 2025 From Noise to Nuance: Enriching Subjective Data Annotation through Qualitative Analysis  
Ruyuan Wan, Haonan Wang, Ting-Hao ‘Kenneth’ Huang, Jie Gao# #Advising Author  
*The 4th HCI+NLP Workshop at the Conference on Empirical Methods in Natural Language Processing (EMNLP 2025)*
- 2024 CollabCoder: A Lower-barrier, Rigorous Workflow for Inductive Collaborative Qualitative Analysis with Large Language Models   [Website](#)  
Jie Gao, Yuchen Guo, Gionnieve Lim, Tianqin Zhang, Zheng Zhang, Toby Jia-Jun Li, Simon Perrault.  
*Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI 2024)*  
Highly cited in its domain; Citations: 170+, Dec, 2025
- 2024 A Taxonomy for Human-LLM Interaction Modes: An Initial Exploration   
Jie Gao\*<sup>\*</sup>, Simret Araya Gebreegziabher\*, Kenny Tsu Wei Choo, Toby Jia-Jun Li, Simon Tangi Perrault, Thomas W Malone  
*Extended Abstracts of the ACM Conference on Human Factors in Computing Systems (CHI EA 2024)* Highly cited in its domain; Citations: 70+, Nov, 2025
- 2024 LLMs as Research Tools: Applications and Evaluations in HCI Data Work   
Marianne Aubin Le Quéré, Hope Schroeder, Casey Randazzo, Jie Gao#, Ziv Epstein, Simon Perrault, David Mimno, Louise Barkhuus, Hanlin Li. #Workshop co-organizer  
*Extended Abstract of the ACM Conference on Human Factors in Computing Systems (CHI2024 Workshop Proposal)*
- 2024 Help Me Reflect: Leveraging Self-Reflection Interface Nudges to Enhance Deliberativeness on Online Deliberation Platforms   
ShunYi Yeo, Gionnieve Lim, Jie Gao, Weiyu Zhang, Simon Tangi Perrault.  
*Proceedings of the ACM Conference on Human Factors in Computing Systems (CHI 2024)*
- 2023 CoAICoder: Examining the Effectiveness of AI-assisted Human-to-Human Collaboration in Qualitative Analysis   
Jie Gao, Kenny Tsu Wei Choo, Junming Cao, Roy Ka Wei Lee, Simon Perrault.  
*ACM Transactions on Computer-Human Interaction (TOCHI 2023)*  
Highly cited in its domain; Citations: 90+, Dec, 2025
- 2023 VISAR: A Human-AI Argumentative Writing Assistant with Visual Programming and Rapid Draft Prototyping   
Zheng Zhang, Jie Gao, Ranjodh Singh Dhaliwal, Toby Jia-Jun Li.  
*Proceedings of the ACM Symposium on User Interface Software and Technology (UIST 2023)*  
Highly cited in its domain; Citations: 160+, Nov, 2025

- 2023 **GlassMessaging: Towards Ubiquitous Messaging Using OHMDs**  Nuwan Janaka, **Jie Gao**, Lin Zhu, Shengdong Zhao, Lan Lyu, Peisen Xu, Maximilian Nabokow, Silang Wang, Yanch Ong  
*Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT 2023)*
- 2023 **Understanding Complexity and Its Impact on Testing in ML-Enabled Systems**  Junming Cao, Bihuan Chen, Longjie Hu, **Jie Gao**, Kaifeng Huang, Xuezhi Song, Xin Peng  
*IEEE International Conference on Software Maintenance and Evolution (ICSME 2023)*
- 2022 **Differences of Challenges of Working from Home (WFH) between China and the US during COVID-19**   
**Jie Gao**, Xiayin Ying, Junming Cao, Yifan Yang, Pin Sym Foong, Simon Perrault  
*Extended Abstracts of the ACM Conference on Human Factors in Computing Systems (CHI EA 2022)*

## Demo, Preprints

- 2023 **CollabCoder: A GPT-Powered Workflow for Collaborative Qualitative Analysis**  
**Jie Gao**, Yuchen Guo, Toby Jia-jun Li, Simon Perrault.  
*ACM Conference on Computer-Supported Cooperative Work and Social Computing (CSCW Demo 2023)*
- 2022 **From 996 to 007: Challenges of Working from Home During the Epidemic in China**  
**Jie Gao**, Pin Sym Foong, Yifan Yang, et al.  
*arXiv preprint, arXiv:2201.09045*
- 2018 **Expressive Plant: A Multisensory Interactive System for Sensory Training of Children with Autism**  
**Jie Gao**, Leijing Zhou, Miaomiao Dong, Fan Zhang.  
*Poster presented at ACM International Joint Conference on Pervasive and Ubiquitous Computing (Ubicomp Poster 2018)*

## Invited Talks & Presentations

- 2025.11 **Human–AI Collaboration for Complex Unstructured Data Analysis**  
*Western Michigan University*  [Slides](#)
- 2025.10 **From Automation to Human-AI Collaboration: Methods and Applications for Insights Extraction in Unstructured Data**  
*Malone Center Research Lunch at Johns Hopkins University*
- 2025.07 **AI for Text Production and Analysis**  
*HCIX Research Club*
- 2025.04 **Designing Human-AI Teams to Extract Insights from Unstructured Data—Methods and Applications**  
*HCI Seminar at Johns Hopkins University*
- 2025.03 **Human-Centric Software Engineering in the Era of Large Language Models**  
*Singapore Management University*
- 2025.02 **Extracting Insights from (Un)structured Data: Methods and Applications**  
*M3S Seminar in Mens Manus Machina (M3S) team at Singapore-MIT Alliance for Research and Technology*

## Academic Service

- Associate Chair, *ACM Conference on Human Factors in Computing Systems (CHI 2025 & 2026), Main Track*
- Reviewer, *Annual ACM Symposium on User Interface Software and Technology (UIST 2025)*
- Reviewer, *Computers in Human Behavior Reports 2025*
- Reviewer, *International Journal of Human–Computer Interaction (IJHCI 2025, 2026)*
- Reviewer, *ACM Transactions on Interactive Intelligent Systems (TiiS 2024, 2025)*

- Associate Chair, *ACM Conference on Human Factors in Computing Systems (CHI 2022, 2023), Late-Breaking Work Track*
- Reviewer, *ACM Conference on Computer-Supported Cooperative Work and Social Computing (CSCW 2022, 2023)*
- Reviewer, *ACM Conference on Human Factors in Computing Systems (CHI 2023, 2024)*
- Reviewer, *International Conference on Artificial Intelligence in Education (AIED 2023)*

### Mentoring Experience

Spring 2026	<b>Yifan Zhang (PhD Student)</b> National University of Singapore
Fall 2025	<b>Mian Zhong (PhD Student)</b> Johns Hopkins University
Fall 2025	<b>Jonathan Ivey (PhD Student)</b> Johns Hopkins University
Fall 2025	<b>Rongkun Zhou (Master)</b> Johns Hopkins University
Summer-Fall 2025	<b>Haonan Wang (Master)</b> Johns Hopkins University
Summer 2024	<b>Ruyuan Wan (PhD Student)</b> Pennsylvania State University
Summer-Spring 2024–2025	<b>Zhiyao Shu (Master, Remote Research Intern)</b> University of California, Berkeley (Graduated). Now incoming PhD student at George Mason University
Summer–Winter 2024	<b>Xiaoxian Zhang (Master, Research Intern)</b> National University of Singapore
Summer 2024	<b>Erika Lee (Undergraduate, Research Intern)</b> University of California, San Diego
Fall 2022–Spring 2023	<b>Yuchen Guo (Undergraduate, Research Intern)</b> Singapore University of Technology and Design (Graduated). Now Software Developer in SynaXG, Singapore
Fall 2022	<b>Tianqin Zhang (Undergraduate, Research Intern)</b> Singapore University of Technology and Design

### Teaching Experience

Fall 2020	<b>Teaching Assistant, 50.002: Introduction to Algorithms</b> (Singapore University of Technology and Design)
Summer 2020	<b>Teaching Assistant, 50.017: Graphics and Visualization</b> (Singapore University of Technology and Design)

### Technical Skills

#### Programming Languages & Development

Python, JavaScript, HTML/CSS, L<sup>A</sup>T<sub>E</sub>X, React.js, Node.js, MongoDB, Git, etc.

#### Quantitative Data Analysis & Machine Learning

Pandas, Numpy, SciPy, scikit-learn, PyTorch, NLTK, Matplotlib, Seaborn

#### Qualitative Analysis

Grounded Theory, Thematic Analysis, Atlas.ti, etc.

#### Tools & Platforms

Photoshop, Illustrator, Premiere, etc.

### References

- Mark Dredze** (mdredze@cs.jhu.edu, +1 (410) 516-6786)  
Professor, Johns Hopkins University

**Thomas W. Malone** (malone@mit.edu, +1 (617) 253-6843)

Professor, Massachusetts Institute of Technology

**Simon Perrault** (simon.perrault@telecom-paris.fr, +33 664871217)

Now: Professor, Télécom Paris, Institut Polytechnique de Paris

Formerly: Assistant Professor, Singapore University of Technology and Design

**Ziang Xiao** (ziang.xiao@jhu.edu, +1 (217)281-2005)

Assistant Professor, Johns Hopkins University

**Toby Jia-Jun Li** (toby.j.li@nd.edu, +1 (574) 631-5375)

Assistant Professor, University of Notre Dame

If you require further information, please contact:

**Chien-Ming Huang** (chienming.huang @jhu.edu)

Assistant Professor, Johns Hopkins University

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