

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

Malone Hall, 3400 N Charles St, Baltimore, MD 21218, USA

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**  [arXiv](https://arxiv.org/abs/2501.00775)  [Tool Website](https://tool-website.com)
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^{*}, 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	Yifan Zhang (PhD Student) National University of Singapore
Fall 2025	Mian Zhong (PhD Student) Johns Hopkins University
Fall 2025	Jonathan Ivey (PhD Student) Johns Hopkins University
Fall 2025	Rongkun Zhou (Master) Johns Hopkins University
Summer-Fall 2025	Haonan Wang (Master) Johns Hopkins University
Summer 2024	Ruyuan Wan (PhD Student) Pennsylvania State University
Summer-Spring 2024–2025	Zhiyao Shu (Master, Remote Research Intern) University of California, Berkeley (Graduated). Now incoming PhD student at George Mason University
Summer–Winter 2024	Xiaoxian Zhang (Master, Research Intern) National University of Singapore
Summer 2024	Erika Lee (Undergraduate, Research Intern) University of California, San Diego
Fall 2022–Spring 2023	Yuchen Guo (Undergraduate, Research Intern) Singapore University of Technology and Design (Graduated). Now Software Developer in SynaXG, Singapore
Fall 2022	Tianqin Zhang (Undergraduate, Research Intern) Singapore University of Technology and Design

Teaching Experience

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

Technical Skills

Programming Languages & Development

Python, JavaScript, HTML/CSS, L^AT_EX, 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:

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Assistant Professor, Johns Hopkins University

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