

SIJIA LIU

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RESEARCH INTERESTS

- Aligning large language models with pluralistic human preferences.
- Building LLM-based multi-agent systems for scientific discovery and social good.

EDUCATION

- **Princeton University** August 2024 - July 2029
Ph.D. in Computer Science Princeton, USA
 - Advisor: [Prof. Peter Henderson](#)
 - Research Topics: AI alignment, Natural Language Processing, Large Language Models
- **Carnegie Mellon University** August 2017 - July 2018
M.Sc. in Statistics and Data Science Pittsburgh, USA
 - Advisor: [Prof. Howard J. Seltman](#), [Prof. Joel Greenhouse](#)
 - GPA: 4.06/4.00
- **Peking University** September 2013 - July 2017
B.Law. in Sociology, B.A. in Economics (double majors) Beijing, China
 - Advisor: [Prof. Jianxin Li](#), [Prof. Lin Tao](#)
 - GPA: 3.84/4.0 (ranked 1/70)

PATENTS AND PUBLICATIONS

C=CONFERENCE, J=JOURNAL, P=PATENT, S=IN SUBMISSION, T=THESIS

- [C.1] Thomas Palmeira Ferraz, Kartik Mehta, Yu-Hsiang Lin, Haw-Shiuan Chang, Shereen Oraby, **Sijia Liu**, Vivek Subramanian, Tagyoung Chung, Mohit Bansal, Nanyun Peng. **LLM Self-Correction with DeCRIM: Decompose, Critique, and Refine for Enhanced Following of Instructions with Multiple Constraints**. To appear at EMNLP 2024.
- [C.2] Prakhar Gupta, Yang Liu, Di Jin, Behnam Hedayatnia, Spandana Gella, **Sijia Liu**, Patrick Lange, Julia Hirschberg, Dilek Hakkani-Tur. **DialGuide: Aligning Dialogue Model Behavior with Developer Guidelines**. In *Findings of the Association for Computational Linguistics*. EMNLP 2023.
- [C.3] Sarik Ghazarian, Behnam Hedayatnia, Di Jin, **Sijia Liu**, Nanyun Peng, Yang Liu, Dilek Hakkani-Tur. **MERCY: Multiple Response Ranking Concurrently in Realistic Open-Domain Conversational Systems**. In *Proceedings of the 24th Annual Meeting of the Special Interest Group on Discourse and Dialogue*. SIGDial 2023.
- [C.4] Michael Johnston, Cris Flagg, Anna Gottardi, Sattvik Sahai, Yao Lu, Samyuth Sagi, Luke Dai, Prasoon Goyal, Behnam Hedayatnia, Lucy Hu, Di Jin, Patrick Lange, Shaohua Liu, **Sijia Liu**, Daniel Pressel, Hangjie Shi, Zhejia Yang, Chao Zhang, Desheng Zhang, Leslie Ball, Kate Bland, Shui Hu, Osman Ipek, James Jeun, Heather Rocker, Lavina Vaz, Akshaya Iyengar, Yang Liu, Arindam Mandal, Dilek Hakkani-Tür, Reza Ghanadan. **Advancing open domain dialog: The Fifth Alexa Prize SocialBot Grand Challenge**. In *Alexa Prize SocialBot Grand Challenge 5 Proceedings (2023)*.
- [C.5] **Sijia Liu**, Patrick Lange, Behnam Hedayatnia, Alexandros Papangelis, Di Jin, Andrew Wirth, Yang Liu, Dilek Hakkani-Tur. **Towards Credible Human Evaluation of Open-Domain Dialog Systems Using Interactive Setup**. In *Proceedings of the AAAI Conference on Artificial Intelligence*. AAAI 2023 (Oral and Poster); also accepted to NeurIPS HEGM workshop (Oral) and EMNLP GEM workshop (Oral).
- [C.6] Di Jin, **Sijia Liu**, Yang Liu, Dilek Hakkani-Tur. **Improving Bot Response Contradiction Detection via Utterance Rewriting**. In *Proceedings of the AAAI Conference on Artificial Intelligence*. SIGDial 2022.

RESEARCH EXPERIENCE

• Amazon AGI [🌐]

September 2021 – August 2024

Research Scientist (full-time) @ AGI Foundation Model Post-Training Team

Sunnyvale, CA

- Supervisors: [Dr. Yang Liu](#), [Prof. Dilek Hakkani-Tur](#)
- Improved [Amazon latest large language models – the Nova series](#) reasoning capabilities on knowledge-based multiple-choice questions (MCQ) and **conversational capabilities** via supervised fine-tuning, curriculum learning, and continuous pre-training, model API currently available for public use on [AWS Bedrock](#).
- Implemented **internal STEM-focused benchmarks** (e.g. MMLU, MMLU-Pro, GPQA) to better evaluate large language models' performances on challenging MCQ problems.
- Led a team of three scientists and built the first set of **large-scale data synthesis pipelines** to generate high-quality educational instruction and preference data in STEM domains.
- Led the first **large-scale multi-turn human demonstration** collection with internal search API integration and significantly improved models' conversational capabilities.
- Published **6 first-authored or co-authored papers** at top AI/NLP conferences on open-domain dialogue systems, topics including:
 - * Self-improvement capabilities of large language models on realistic complex instruction following.
 - * Sample-efficient interactive human evaluation for open-domain dialogue systems.
 - * Controllable response generation and ranking with guidelines.
 - * Contradiction detection via utterance rewriting in multi-turn human-bot dialogues.
 - * Situated conversational storytelling.

• Peking University [🌐]

August 2016 – May 2017

Undergraduate Thesis

Beijing, China

- Thesis Advisor: [Prof. Jianxin Li](#)

- Research Topic: Conducted multivariate logistic regression analysis to explore the impact of intergenerational relationship on fertility behavior in rural Chinese families through two major channels of time transfers and economic transfers with China Health and Retirement Longitudinal Study (CHARLS) 2011-2013 panel data.
- Thesis won **1st place in quantitative research** of the cohort and **2nd place over the past 5 years**.

• Peking University [🌐]

May 2016 – May 2017

Undergraduate Researcher

Beijing, China

- Thesis Advisor: [Prof. Lin Tao](#)

- Research Topic: Conducted field research and case studies on two well-known undergraduate startups to explore the impact of social recognition in entrepreneurial motivation dynamics from the perspective of startup lifecycle.
- Research was funded by **Peking University Principal Fellowship** (Top 5%).

• Peking University [🌐]

February 2016 – May 2016

Co-Lead Undergraduate Researcher

Beijing, China

- Thesis Advisor: [Prof. Yunfeng Lu](#)

- Research Topic: Conducted a comprehensive discourse analysis on Chinese internet buzzwords to explore how pragmatics reflect speakers' social identity and contribute to the popularity of top internet buzzwords.
- Final report won the **Outstanding Research Award** in the university-wide Multidisciplinary Challenge Cup Academic Competition – Special Contribution Track (Top 1%).

PROFESSIONAL EXPERIENCE

• Amazon Web Services [🌐]

October 2018 – March 2021

Data Scientist @ EC2 Core Science Team

Seattle, USA

- Built tree-based ensemble models to perform EC2 multi-class workload classification with high-dimensional data.
- Built causal inference methods to differentiate the cannibalization effects of new EC2 instance launch.
- Built time series models to predict EC2 growth with seasonality and moving holidays.

• Carnegie Mellon University [🌐]

August 2017 – May 2018

Graduate Student Statistician

Pittsburgh, USA

- Built hierarchical Zero-Inflated Negative Binomial regression models to predict baseball player injuries.
- Wrote a song identifier program to automatically look up song titles with signal processing methods.
- Wrote a text query program to auto-complete a search entry given a prefix in a local database.

• Tencent Research Institute [🌐]

September 2016 – February 2017

Data Scientist Intern

Beijing, China

- Ran simulations to estimate digital lucky money spendings during Chinese spring festival.
- Analyzed WeChat user data to build user profiles and understand user behaviors.

• Pfizer [🌐]


March 2017 – June 2017

Quantitative Consultant Intern

Beijing, China

- Analyzed survey data and drug market scenarios under different projected quality evaluation policies.
- Analyzed big data applications for pharmaceutical companies, leading to partnerships with 2 AI startups.

TEACHING EXPERIENCE

- **Carnegie Mellon University** 
Teaching Assistant, Department of Statistics and Data Science
 - Held weekly programming labs and office hours to help 50 students understand course materials better.
 - Graded homework and exams for 10 hours per week, advised 20+ students on capstone projects.
- August 2017 – May 2018*
Pittsburgh, USA

SERVICE EXPERIENCE

- **ACL Rolling Review:** June 2024, February 2024
- **EMNLP GEM:** 2023

LEADERSHIP AND COMMUNITY SERVICE

- **Peking University North California Alumni Association**, Volunteer
- **Bay Area Chinese Culture Salon (BACCS)**, Volunteer
- **Seattle Chinese Culture Salon**, Volunteer
- **Seattle Theater Art (STArt) Film Studio**, Co-founder & **Award-Winning Scriptwriter**
- **China Social Enterprise and Investment Forum**, Program manager
- **Peking University Global Pioneer Spirit Walkathon**, Co-organizer
- **Peking University Student Association**, Director of Department of Publicity
- **Peking University Zhijiang Development Forum**, Director of Department of Organization
- **Peking University Volleyball Association**, Leader of Women Volleyball Team

SELECTED AWARDS & SCHOLARSHIPS

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| • Statistical Practice Scholarship (top 10%), Carnegie Mellon University | 2018 |
| • Pacesetter to Merit Student (top 5%), Peking University | 2014-2017 |
| • Outstanding Undergraduate of the Class (top 5%), Peking University | 2017 |
| • Outstanding Undergraduate Thesis (top 5%), Peking University | 2017 |
| • Outstanding Research Award at Challenge Cup Academic Competition (top 3%), Peking University | 2016 |
| • Principal Fellowship for Undergraduate Research (top 10%), Peking University | 2016 |
| • Samsung Scholarship (top 5%), Peking University | 2016 |
| • National Scholarship (top 1%), Peking University | 2015 |
| • May 4th Scholarship (top 5%), Peking University | 2014 |

SKILLS

- **Programming Languages:** Python, R, SQL, Matlab, Stata, SAS, SPSS
- **Development Skills:** Pytorch, Tensorflow, PySpark

ADDITIONAL INFORMATION

- **Languages:** Mandarin (native), English (proficient), Korean (1 yr), German (1 yr), Japanese (1 yr)
- **Interests:** Running (finished my 1st half marathon in San Francisco 2024!), Reading, Stand-up Comedy, Traveling