

# Shuli Jiang

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🐙 @11hifish

🔗 Google Scholar

🌐 <https://11hifish.github.io/>

## Research Interests

I am a fifth-year Ph.D. student at the School of Computer Science, Carnegie Mellon University, advised by Prof. Gauri Joshi. My research spans the theory and applications of machine learning optimization, differential privacy, distributed learning, communication efficiency, and the security of large language models (LLMs).

## Education

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|------------------------|---|
| August 2020 – present  | 📖 <b>Carnegie Mellon University, Pittsburgh, PA, USA</b><br>Ph.D. student at the Robotics Institute, School of Computer Science<br>Advisor: Prof. Gauri Joshi<br>Expected Graduation Date: June 2025    |
| May 2019 – May 2020    | 📖 <b>Carnegie Mellon University, Pittsburgh, PA, USA</b><br>M.S. in Computer Science<br>Thesis title: <i>Deep Multi-view Clustering Using Local Similarity Graphs</i><br>Advisor: Prof. Artur Dubrawski |
| August 2015 – May 2019 | 📖 <b>Carnegie Mellon University, Pittsburgh, PA, USA</b><br>B.S. in Computer Science, University Honor<br>Minor: Electrical and Computer Engineering  |

## Research Publications

( $\alpha\beta$ : alphabetical order, \*\*: contribution order)

### In Submission

1. (\*\*) Shuli Jiang, Pranay Sharma, Zhiwei Steven Wu, Gauri Joshi  
**The Cost of Shuffling in Private Gradient Based Optimization**  
*In Submission to ICML 2025*

### Preprints

1. (\*\*) Shuli Jiang, Swanand Ravindra Kadhe, Yi Zhou, Farhan Ahmed, Ling Cai, Nathalie Baracaldo  
**Turning Generative Models Degenerate: The Power of Data Poisoning Attacks**  
*arXiv 2024* 🌐 [Link](#)

### Conference / Journal Proceedings

1. (\*\*) Shuli Jiang, Qiuyi Richard Zhang, Gauri Joshi  
**Optimized Tradeoffs for Private Prediction with Majority Ensembling**  
*Transaction on Machine Learning Research (TMLR November 2024)* 🌐 [Link](#)
2. (\*\*) Shuli Jiang, Pranay Sharma, Gauri Joshi  
**Correlation Aware Sparsified Mean Estimation Using Random Projection** 🌐 [Link](#) 🐙 [Code](#)  
*The Thirty-seventh Conference on Neural Information Processing Systems (NeurIPS 2023)*
3. (\*\*) Shuli Jiang, Robson Leonardo Ferreira Cordeiro, Leman Akoglu

## D.MCA: Outlier Detection with Explicit Micro-Cluster Assignments [Link](#) [Code](#)

*The Twenty-second IEEE International Conference on Data Mining (ICDM 2022)*

- ( $\alpha\beta$ ) [Shuli Jiang](#), Hai Thanh Pham, David P. Woodruff, Qiuyi Richard Zhang

### Optimal Sketching for Trace Estimation [Link](#) [Code](#)

*The Thirty-fifth Conference on Neural Information Processing Systems (NeurIPS 2021 *Spotlight*)*

- ( $\alpha\beta$ ) [Shuli Jiang](#), Dongyu Li, Irene Mengze Li, Arvind V. Mahankali, David P. Woodruff

### Streaming and Distributed Algorithms for Robust Column Subset Selection [Link](#) [Code](#)

*The Thirty-eighth International Conference on Machine Learning (ICML 2021)*

- (\*\*) Bohan Zhang, Dana Van Aken, Justin Wang, Tao Dai, [Shuli Jiang](#), Jacky Lao, Siyuan Sheng, Andrew Pavlo, Geoffrey J. Gordon

### A Demonstration of the OtterTune Automatic Database Management System Tuning Service

 [Link](#)  [Code](#)

*The VLDB Endowment, Vol. 11, No. 12 (VLDB 2018)*

## Workshop Proceedings

- (\*\*) [Shuli Jiang](#), Swanand Kadhe, Yi Zhou, Ling Cai, Nathalie Baracaldo

### Forcing Generative Models to Degenerate Ones: The Power of Data Poisoning Attacks [Link](#)

*NeurIPS 2023 Workshop on Backdoors in Deep Learning - The Good, the Bad, and the Ugly (*Best Poster Award*)*

## Technical Reports

- ( $\alpha\beta$ ) Theresa Gebert, [Shuli Jiang](#), Jiaxian Sheng

### Characterizing Allegheny County Opioid Overdoses with an Interactive Data Explorer and Synthetic Prediction Tool [Link](#) [Code](#)

*HackAuton Best Show Prize, 2018*

- [Shuli Jiang](#)

### Deep Multi-view Clustering Using Local Similarity Graphs [Link](#)

*Master's Thesis, 2020, Advisor: Prof. Artur Dubrawski*

## Patent

April 2024



Inventors: [Shuli Jiang](#), Swanand Kadhe, Yi Zhou, Ling Cai, Nathalie Baracaldo

Title: **A System and Method to Defend Against Data Poisoning Attacks Targeting Generative LLMs**

Reference number: P202303734US01

Filed by IBM Research

## Work Experience

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- January 2024 - April 2024  **Google Research**, Remote in Pittsburgh, PA, USA  
Student Researcher (Part-Time)  
Manager: Nicolas Mayoraz  
**Focus: Differential Privacy, Recommender Systems**  
Continue working on private learning for recommender systems.
- September 2024 - November 2024  **Google Research**, Remote in Pittsburgh, PA, USA  
Student Researcher (Part-Time)  
Manager: Walid Krichene, Nicolas Mayoraz  
**Focus: Differential Privacy, Recommender Systems**  
Continue working on private learning for recommender systems.
- May 2024 - August 2024  **Google Research**, Mountain View, CA, USA  
Student Researcher  
Manager: Walid Krichene, Nicolas Mayoraz  
**Focus: Differential Privacy, Recommender Systems**  
Design differentially private learning algorithms for training models, such as Factorization Machines, for ads prediction and recommender systems. Our focus is on scenarios where datasets contain both private and public features, exploring how to leverage public features to improve the privacy-utility trade-off.
- May 2023 - August 2023  **IBM Research (Almaden)**, San Jose, CA, USA  
Research Summer Intern (AI Security and Privacy Solutions)  
Advisor: Swanand Kadhe, Manager: Nathalie Baracaldo  
**Focus: Large Language Model (LLM) Security**  
Investigate security vulnerabilities of large language models (LLMs) in terms of data poisoning attacks targeting natural language generation (NLG) tasks, including text summarization, text completion, table-to-text generation, etc. Design and develop defense strategies to counter-attack those types of security threats to LLMs.
- June 2018 - August 2018  **Morgan Stanley**, New York City, NY, USA  
Technology Analyst (Application Development)  
**Focus: Outlier Detection**  
Develop a data quality management system which collects real-time trading data from multiple source databases, detects potential anomalies to ensure data quality and visualizes anomalous data.
- June 2017 - August 2017  **PreSenso Ltd.**, Haifa, Israel  
Software Engineer Intern  
**Focus: Outlier Detection**  
Develop an anomaly detection benchmark for evaluating and comparing the performances of different anomaly detection algorithms on various patterns of anomalies.

## Public Talks

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- September 2024  CMU CyLab Security & Privacy Institute Partners Conference  
Topic: Differentially Private Incremental Gradient (IG) Methods with Public Data

## Public Talks (continued)

February 2024	■ NSF CPS Frontier Annual Review Lightening Talk (3-min) Topic: Distributed Vector Mean Estimation
September 2023	■ AI-EDGE Students and Postdocs gathering for AI Research and Knowledge Sharing (AI-EDGE SPARKS) Topic: Federated Learning and Distributed Vector Mean Estimation
May 2023	■ CMU Robotics Institute Ph.D. Speaking Qualifier Public Talk Topic: Differential Privacy and Private Majority Ensembling

## Service

Conference/Workshop Reviewer	■ SODA 2022, SIGKDD 2023, NeurIPS 2023, ICLR 2024, AISTATS 2024, SDM 2024, ISIT 2024, NeurIPS 2024, ICLR 2025, AISTATS 2025, MLSys 2025, ICML 2025
Workshop Reviewer	■ AAAI The First Workshop on DL-Hardware Co-Design for AI Acceleration 2023, ICLR Workshop R2-FM 2024, ICML Workshop FM-Wild 2024, 2025, AutoML Workshop 2024
Journal Reviewer	■ IEEE/ACM Transactions on Networking 2023, Data-centric Machine Learning Research (DMLR) 2024
Department Service	■ CMU Robotics Institute Ph.D. Admission Committee 2023, 2024

## Teaching Assistantship

Fall 2022	■ <b>16-831 Statistical Techniques in Robotics</b> , @ Carnegie Mellon University
Fall 2020	■ <b>10-725 Convex Optimization</b> , @ Carnegie Mellon University
Fall 2017	■ <b>17-214 Principles of Software Construction</b> , @ Carnegie Mellon University

## Technical Skills

Programming	■ Python, Java, Matlab (Basic), C (Basic)
Tools	■ Python: {Tensorflow, PyTorch, Pandas}, LaTeX

## Awards

2023	■ NeurIPS 2023 Scholar Award
2022	■ IEEE ICDM 2022 Student Travel Award (\$ 700) ■ Graduate Student Assembly/Provost Conference Travel Grant (\$ 750)
2019	■ Carnegie Mellon University Undergraduate University Honor
2015 – 2019	■ Carnegie Mellon University Undergraduate Dean's List
2018	■ HackAuton Best Show Prize
2017 – 2019	■ Carnegie Mellon University Innovation Scholar
2017	■ Buncher Entrepreneurship Award (\$ 10,000)