# Jacob Imola

Website: https://jimola.github.io/ Email: jimola@eng.ucsd.edu

## Education

**University of California, San Diego** 2018-Now
PhD Candidate in Computer Science, Expected Graduation 2023
Advisor: Prof. Kamalika Chaudhuri

**Carnegie Mellon University** 2014-2018
B.S. in Computer Science, Minor in Mathematics
Advisor: Prof. Jean Yang
GPA: 3.85/4.00

## Research Vision

My primary focus is differential privacy, where I am intrigued by questions like how to define privacy for graphs and how to improve the performance of private graph algorithms. I am also interested in the connections between information theory and privacy, such as strong composition and privacy-utility bounds.
I am generally interested in theoretical aspests of transparent machine learning, in which we consider how to take a well-known algorithm like clustering and make it private, robust, resistant to data poisoning, etc.

## Conference Publications

- Jacob Imola, Takao Murakami, and Kamalika Chaudhuri. *Differentially Private Triangle and 4-Cycle Counting in the Shuffle Model*. In **CCS 2022**.
- Jacob Imola, Shiva Kasiviswanathan, Stephen White, Abhinav Aggarwal, Nathanael Teissier. *Balancing Utility and Scalability in Metric Differential Privacy*. In **UAI 2022**.
- Jacob Imola, Takao Murakami, and Kamalika Chaudhuri. *Communication-Efficient Triangle Counting under Local Differential Privacy*. In **USENIX Security 2022**.
- Jacob Imola, Takao Murakami, and Kamalika Chaudhuri. *Locally Differentially Private Analysis of Graph Statistics*. In **USENIX Security 2021**.
- Kamalika Chaudhuri, Jacob Imola, and Ashwin Machanavajjhala. *Capacity Bounded Differential Privacy*. In **NeurIPS 2019**.

## Preprints

- Jacob Imola, Amrita Roy Chowdhury, and Kamalika Chaudhuri. *Robustness of Locally Differentially Private Graph Analysis Against Poisoning*. In submission to USENIX 2023.
- Robi Bhattacharjee and Jacob Imola. *No-Substitution $k$-means Clustering with Low Center Complexity and Memory*. In submission to ALT 2023.

## Other Publications

- Jacob Imola and Kamalika Chaudhuri. *Privacy Amplification Via Bernoulli Sampling*. In **TPDP Workshop at ICML 2021**.

## Work Experience

**Research Intern**, Google — June - September 2022
Host: Alessandro Epasto

- Developed hierarchical clustering algorithms under differential privacy; paper in preparation.
- Implemented private graph building pipeline in C++.

**Research Intern**, Amazon — June - September 2021
Host: Abhinav Aggarwal

- Optimized utility for private text-release mechanism.
- First author of paper *Balancing Utility and Scalability in Metric Differential Privacy*.
- Source at https://bitbucket.org/jjimola/dptextgeometry/

## Teaching Experience

**High School Research Mentor** — June 2021-July 2021
Summer STEM Institute

**Teaching Assistant** — January 2021-March 2021
CSE 151A: Introduction to AI: A Statistical Approach

**Teaching Assistant** — January 2020-March 2020
CSE 151A: Introduction to AI: A Statistical Approach

## Service

- Mentor for UCSD Graduate Women in Computer Science, 2021 & 2022.
- Reviewer for NeurIPS 2022, ICML 2022, NeurIPS 2021, PRIML Workshop at NeurIPS 2021.

## Computer Skills

Programming Languages: C++, Python, OCaml, Java, R, Javascript, SQL, LaTeX
Industrial Tools: Numpy/Scipy, Scikit-learn, Sage.

## Other Experience

**Summer Intern** — June 2017-August 2017
Quantitative Market Researcher at Jump Trading

**Summer Intern** — June 2016-August 2016
Software Engineer at Salesforce

## Academic Honors

2018 Senior Thesis Honors Program at CMU
2016 William Lowell Putnam Math Competition Honorable Mention
2015 ACM-ICPC Regional Programming Competition Team Member