

# Jacob Imola

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## Education

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### 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

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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 becoming more interested in theoretical aspects of transparent machine learning/statistics, such as how to take a well-known problem like clustering and design algorithms which are private, robust, resistant to data poisoning, etc.

## Conference Publications

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- 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

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- Jacob Imola, Amrita Roy Chowdhury, and Kamalika Chaudhuri. *Robustness of Locally Differentially Private Graph Analysis Against Poisoning*. 2022
- Robi Bhattacharjee, Jacob Imola, Michal Moshkovitz, and Sanjoy Dasgupta. *Online  $k$ -means Clustering on Arbitrary Data Streams*. 2022

## Other Publications

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

## Work Experience

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**Research Intern**, Google  
Host: Alessandro Epasto

June - September  
2022

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

**Research Intern**, Amazon  
Host: Abhinav Aggarwal

June - September  
2021

- 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

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**High School Research Mentor**  
Summer STEM Institute

June 2021-July  
2021

**Teaching Assistant**  
CSE 151A: Introduction to AI: A Statistical Approach

January  
2021-March 2021

**Teaching Assistant**  
CSE 151A: Introduction to AI: A Statistical Approach

January  
2020-March 2020

## Service

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- 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

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

## Other Experience

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**Summer Intern**

Quantitative Market Researcher at Jump Trading

June 2017-August  
2017

**Summer Intern**

Software Engineer at Salesforce

June 2016-August  
2016

## Academic Honors

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2018 Senior Thesis Honors Program at CMU

2016 William Lowell Putnam Math Competition Honorable Mention

2015 ACM-ICPC Regional Programming Competition Team Member