

Tomer Shoham

The Hebrew University of Jerusalem (HUJI)

✉ Tomer.shohamm@gmail.com

🌐 TomerShoham.com

RESEARCH INTEREST

My research lies at the intersection of *differential privacy* and *statistics*. I develop practical methods for privacy-preserving data analysis, focusing on adapting classical statistical procedures-such as ratio odds ratios and relative risk estimation and confidence interval construction, CDF estimation, and non-parametric resampling methods to the constraints of differential privacy.

A current focus of my work is understanding the statistical and privacy properties of sampling-based procedures such as subsampling and bootstrapping. I am particularly interested in quantifying privacy amplification induced by sampling and identifying regimes where sampling provides substantially more privacy than commonly assumed.

EDUCATION

2022–	PhD • Computer Science, HUJI, advised by Prof. Katrina Ligett and Prof. Yosef Rinott
2018–2021	MSc (magna cum laude) • Statistics, with specialization in the study of rationality, HUJI, advised by Prof. Yosef Rinott
2015–2018	BSc (magna cum laude) • Economics & Statistics, HUJI

EMPLOYMENT

2019–	Research Assistant to Prof. Gil Kalai • HUJI Studying the statistical aspects of quantum supremacy experiments
2019–2023	Research Assistant, Statistical Consulting Lab • HUJI Interdisciplinary applied research with Maccabi Healthcare Services and Hadassah Medical Center, examining environmental exposures and fetal growth.
2017–2020	Data Analyst and Project Lead • Israeli Ministry of Finance Statistical analysis of HR and wage data; led data analysis projects.

TEACHING

2023–	Applied Data Privacy (HUJI) • Co-developer and Instructor Designed and taught an interactive, hands-on course; developing an online version.
2021–	Foundations of Data Privacy (HUJI) • Co-developer and Teaching Assistant Developed course materials, wrote exercises, taught tutorials, and graded coursework.
2022–2023	Statistics for Data Science (HUJI) • Teaching Assistant (recitation instructor)
2023–2024	Networks, Crowds, and Markets (HUJI) • Teaching Assistant (recitation instructor)

AWARDS

- CIDR Scholarship (2020–2022)
- Outstanding Student Award, Department of Statistics (2018–2020)
- Outstanding Student Award, Faculty of Social Sciences (2018–2019)

PROFESSIONAL MEMBERSHIP

- Member in the Federmann Center for the Study of Rationality
- Former member in the Center for Interdisciplinary Data Science Research (CIDR)

MILITARY SERVICE

2012–2015	SIGINT Systems Technician • Unit 8200, Israeli Intelligence Corps Worked on LAN protocols, satellite communications, IT, and RF systems.
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PAPERS

Journal papers

- [1] Ronit Nirel, Tomer Shoham, Ran Rotem, Wiessam Abu Ahmad, Gideon Koren, Itai Kloog, Rachel Golan, and Hagai Levine. *Maternal exposure to particulate matter early in pregnancy and congenital anomalies in offspring: Analysis of concentration-response relationships in a population-based cohort with follow-up throughout childhood*. In: *Science of The Total Environment* 880 (2023), p. 163082.
- [2] Yosef Rinott, Tomer Shoham, and Gil Kalai. *Statistical aspects of the quantum supremacy demonstration*. In: *Statistical Science* 37.3 (2022), pp. 322–347.

Conference papers

- [3] Tomer Shoham and Yosef Rinott. *Asking the proper question: Adjusting queries to statistical procedures under differential privacy*. In: *International Conference on Privacy in Statistical Databases*. Springer. 2022, pp. 46–61.

Preprints

- [4] Tomer Shoham and Katrina Ligett. *Differentially private ratio statistics*. In: *arXiv preprint arXiv:2505.20351* (2025).
- [5] Tomer Shoham, Moshe Shenfeld, Noa Velner-Harris, and Katrina Ligett. *Black-Box Differentially Private Nonparametric Confidence Intervals Under Minimal Assumptions*. In: *arXiv preprint arXiv:2511.01303* (2025).
- [6] Gil Kalai, Yosef Rinott, and Tomer Shoham. *Random Circuit Sampling: Fourier Expansion and Statistics*. In: *arXiv preprint arXiv:2404.00935* (2024).
- [7] Gil Kalai, Yosef Rinott, and Tomer Shoham. *Questions and Concerns About Google’s Quantum Supremacy Claim*. In: *arXiv preprint arXiv:2305.01064* (2023).
- [8] Gil Kalai, Yosef Rinott, and Tomer Shoham. *Google’s Quantum Supremacy Claim: Data, Documentation, and Discussion*. In: *arXiv preprint arXiv:2210.12753* (2022).