Abigail Gentle

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Professional Summary

My work aims to understand the limits of statistical inference under Differential Privacy, the gold-standard for mathematically provable privacy. I work primarily in the local model, where data is made private before it is collected and stored. To this end, I have had the pleasure of working on fundamental problems such as quantiles (ICML 2025), hypothesis testing (ITCS 2026), and histograms, where I got to work on both novel error bounds (ITCS 2025), and later, was able to prove a novel connections between optimal algorithms and a special class of combinatorial objects (ITW 2025). I am broadly interested in collaborating on problems in learning theory and property testing, as well as applied problems of statistics and the application of privacy enhancing technologies to the social sciences.

Education

2023 - Present | **Doctor of Philosophy, Computer Science**
The University of Sydney, *Supervisors:* Clément Canonne *and* Sasha Rubin

2022 - 2023 | **Bachelor of Science (Computer Science Honours) Honours Class I**
The University of Sydney, *Supervisor:* Clément Canonne
Thesis: "Differential Privacy in the Group Shuffle Model."

2018 - 2022 | **Bachelor of Science (Computer Science) (Philosophy)**
The University of Sydney

Publications

Authors are listed in alphabetical order, with equal contribution from each.

1. C. L. Canonne, **A. Gentle** and V. Singhal, "Uniformity Testing under User-Level Local Privacy." **17th Innovations in Theoretical Computer Science Conference** (ITCS 2026).
2. **A. Gentle**, "Necessity of Block Designs for Optimal Locally Private Distribution Estimation." **IEEE Information Theory Workshop** (ITW 2025).
3. A. Aamand, F. Boninsegna, **A. Gentle**, J. Imola, and R. Pagh, "Lightweight Protocols for Distributed Private Quantile Estimation." **Forty-second International Conference on Machine Learning** (ICML 2025).
4. C. L. Canonne and **A. Gentle**, "Locally Private Histograms in All Privacy Regimes." **16th Innovations in Theoretical Computer Science Conference** (ITCS 2025).

Invited & Conference Talks

2025 | **IEEE Information Theory Workshop**, Sydney, Australia
Necessity of Block Designs for Optimal Locally Private Distribution Estimation

2024 | **Simons Institute for the Theory of Computing**, University of California, Berkeley
Hidden Gems: Kearns Saul's Inequality
For the Sublinear Algorithms Summer Research Program

Institutional Talks and Reading Groups

2024 | **Simons Institute for the Theory of Computing**, University of California, Berkeley
Differential Privacy Reading Group (Organiser)
A weekly differential privacy reading group for the Sublinear Algorithms Summer Research Program. Gave the introductory talk on differential privacy, a focused talk on shuffle differential privacy, and arranged speakers.

2024 - 2025 | **Sydney Algorithms and Computational Theory Group**, University of Sydney
SACT Seminar
Seminars on "Locally Private Histograms in All Privacy Regimes" and "Lightweight Protocols for Distributed Private Quantile Estimation."