



THE UNIVERSITY OF
CHICAGO

DEPARTMENT OF STATISTICS

Statistics Colloquium

VITALY FELDMAN

Apple AI Research

Low-communication Algorithms for Private Federated Data Analysis with Optimal Accuracy Guarantees

MONDAY, April 25, 2022, at 4:30 PM, **via Zoom**

Zoom session information will be sent via our weekly email distribution.

ABSTRACT

Locally Differentially Private (LDP) Reports are commonly used for collection of statistics and machine learning in the federated setting.

Yet for both frequency estimation over a large domain and learning a high-dimensional model the best known LDP algorithms require sending prohibitively large messages from each client device to the server.

In this talk I'll describe several recent results on low-communication LDP protocols with optimal accuracy. In particular,

1. A general approach that, under standard cryptographic assumptions, gives a low communication version of any efficient LDP randomizer with negligible loss in privacy and utility guarantees.
2. New algorithms for frequency estimation and high-dimensional mean estimation that achieve the optimal privacy/utility trade-off and have low communication cost.

Based on joint works with Hilal Asi, Jelani Nelson, Huy Nguyen and Kunal Talwar

Bio: Vitaly Feldman is a research scientist at Apple AI Research working on foundations of machine learning and privacy-preserving data analysis. His recent research interests include tools for analysis of generalization, distributed privacy-preserving learning, privacy-preserving optimization, and adaptive data analysis.

Vitaly holds a Ph.D. from Harvard (2006, advised by Leslie Valiant) and was previously a research scientist at Google Research (Brain team) and IBM Research - Almaden. His work on understanding of memorization in learning was recognized by the 2021 Caspar Bowden Award for Outstanding Research in Privacy Enhancing Technologies and his research on foundations of adaptive data analysis was featured in CACM Research Highlights and Science. His works were also recognized by COLT Best Student Paper Award in 2005 and 2013 (student co-authored) and by the IBM Research Best Paper Award in 2014, 2015 and 2016. He served as a program co-chair for COLT 2016 and ALT 2021 conferences and as a co-organizer of the Simons Institute Program on Data Privacy in 2019.

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