

Om Dipakbhai Thakkar

omthkkr@google.com

www.omthakkar.com

WORK EXPERIENCE

Research Software Engineer, Google, Mountain View, CA 09/19 - Present
Working in the team of Françoise Beaufays on privacy-preserving data analysis.

Visiting Graduate Student, University of California, Berkeley, CA 01/19 - 05/19
Participated in the program Data Privacy: Foundations and Applications.

Software Engineering Intern, Google, Mountain View, CA 05/18 - 08/18
Worked with Úlfar Erlingsson on using adaptivity to improve DP Stochastic Gradient Descent. Empirically showed that the novel technique achieves the utility of the state-of-the-art with up to 30x speed-up in time.

Visiting Student Researcher, University of California, Berkeley, CA 08/17 - 12/17
Worked with Dr. Dawn Song on designing a practical DP optimization algorithm that works for all standard convex losses, can leverage any off-the-shelf optimizer, and has a competitive hyperparameter-free variant.

Software Engineering Intern, Google, Seattle, WA 05/17 - 08/17
Worked with Brendan McMahan on devising adaptive strategies for eliminating hyperparameter tuning for DP federated learning, achieving utility similar to systems with tuned hyperparameters.

Machine Learning Engineer (Intern), CoreOS Team, Apple, Cupertino, CA 05/16 - 08/16
Designed a scalable general-purpose DP recommendation system based on collaborative filtering. Developed a model from scratch showing positive results.

EDUCATION

Ph.D., Computer Science 08/14 - 09/19
Boston University(BU), Boston, MA GPA 4.00/4.00
The Pennsylvania State University (Penn State), University Park, PA¹ GPA 3.97/4.00
Advisor: Dr. Adam Smith

B.Tech., Information and Communication Technology 07/10 - 05/14
Dhirubhai Ambani Institute (DA-IICT), Gujarat, India GPA 8.57/10.00

RESEARCH INTERESTS

Differential Privacy (DP), Private Machine Learning, and Adaptive Data Analysis.

PATENTS

Server Efficient Enhancement of Privacy in Federated Learning. *Filed US Patent 63/035,559.*
Om Thakkar, Peter Kairouz, Brendan McMahan, Borja Balle, and Abhradeep Thakurta.

PUBLICATIONS

Unless specifically indicated, all publications have authors listed in the alphabetical order of last names.

¹Transferred to BU in 01/18.

Privacy Amplification via Random Check-Ins. *To appear in NeurIPS, 2020.*
Borja Balle, Peter Kairouz, Brendan McMahan, Om Thakkar, and Abhradeep Thakurta.

Guaranteed Validity for Empirical Approaches to Adaptive Data Analysis. *In AISTATS, 2020.*
Ryan Rogers, Aaron Roth, Adam Smith, Nathan Srebro, Om Thakkar, and Blake Woodworth.

Towards Practical Differentially Private Convex Optimization. *In S&P, 2019.*
Roger Iyengar, Joseph P. Near, Dawn Song, Om Thakkar, Abhradeep Thakurta and Lun Wang.

Model-Agnostic Private Learning. *In NeurIPS, 2018. (Accepted for an oral presentation)*
Raef Bassily, Om Thakkar, and Abhradeep Thakurta.

Differentially Private Matrix Completion Revisited. *In ICML, 2018. (Accepted for a long talk)*
Prateek Jain, Om Thakkar, and Abhradeep Thakurta.

Max-Information, Differential Privacy, and Post-Selection Hypothesis Testing. *In FOCS, 2016.*
Ryan Rogers, Aaron Roth, Adam Smith, and Om Thakkar.

WORKSHOP PAPERS

Training Production Language Models without Memorizing User Data. *To appear in PPML, 2020. (Accepted for an oral presentation)*

Swaroop Ramaswamy*, Om Thakkar*, Rajiv Mathews, Galen Andrew, Brendan McMahan, and Françoise Beaufays. *(In order of contribution)*

*Equal contribution.

Privacy Amplification via Random Check-Ins. *To appear in TPDP, 2020.*
Borja Balle, Peter Kairouz, Brendan McMahan, Om Thakkar, and Abhradeep Thakurta.

Understanding Unintended Memorization in Federated Learning. *To appear in TPDP, 2020, and PPML, 2020.*

Om Thakkar, Swaroop Ramaswamy, Rajiv Mathews, and Françoise Beaufays. *(In order of contribution)*

Characterizing Private Clipped Gradient Descent on Convex Generalized Linear Problems. *To appear in TPDP, 2020 (accepted for an oral presentation) and PPML, 2020.*

Shuang Song, Om Thakkar, and Abhradeep Thakurta.

PROFESSIONAL SERVICES

Program committee member for TPDP 2020.

Reviewer for JPC 2019, T-IFS 2019, JMLR 2018.

Reviewer for NIST's The Unlinkable Data Challenge: Advancing Methods in Differential Privacy.

Reviewer for NeurIPS (2019-2020), PETS (2017-2020), IJCAI 2019, CCS (2018-2019), S&P (2017, 2019), ICML 2018, STOC (2016, 2018), ACSAC 2017, FOCS 2017, WABI 2015.

TEACHING EXPERIENCE

Teaching Assistant, CMPSC 465 Data Structures and Algorithms, Penn State	01/17 - 05/17
Teaching Assistant, CMPSC 360 Discrete Mathematics for Computer Science, Penn State	01/15 - 05/15
Teaching Assistant, IT 114 Object Oriented Programming, DA-IICT	01/14 - 05/14

Teaching Assistant, IT 105 Introduction to Programming, DA-IICT

08/13 - 12/13

AWARDS AND ACHIEVEMENTS

Received travel awards for S&P 2019, NeurIPS 2018, ICML 2018, a registration award for FOCS 2014, and a GSO Conference Travel Grant for Summer 2018.

Ranked 127th in the ACM - Inter Collegiate Programming Contest, Asia Amritapuri Region, 2012.

Ranked in top 500 in the IEEEExtreme Programming Competition (editions 4.0, and 5.0).

Won state- and district-level yoga competitions, and participated at national and international levels.

POSITIONS OF RESPONSIBILITY

Webmaster of the Theory group webpage, Penn State

08/14 - 05/17

Captain of the Cricket team, DA-IICT

04/13 - 04/14

Vice-Chairperson, IEEE Student Branch, DA-IICT

01/13 - 11/13

Treasurer, IEEE Student Branch, DA-IICT

07/12 - 12/12

NOTABLE PROJECTS

Efficient Pattern Matching incorporating Modifications in a Genome

01/15 - 05/15

Guide: Dr. Paul Medvedev (Penn State)

Team Size - 2

Constructed an algorithm for efficiently re-computing pattern matches in case of any modification in a genome, as well as constructed an appropriate data structure for storing occurrences of each pattern match.

Distributed Data Lookup in a Peer-to-Peer (P2P) File System

08/14 - 12/14

Guide: Dr. Guohong Cao (Penn State)

Team Size - 2

Implemented a P2P file sharing system, and a distributed data lookup for it using TCP/IP.

GRADUATE COURSEWORK

Approximation Algorithms, Graphs of Bounded Widths, Probabilistic Algorithms, Computational Complexity, Cryptography, Error Correcting Codes, Mathematical Logic, Mathematical Neuroscience, Sublinear Algorithms, Algorithms in Bioinformatics, Foundations of Data Privacy, Algorithm Design and Analysis, Distributed Systems.