

Ryan McKenna

PERSONAL INFORMATION

WEBSITE: <https://cs.umass.edu/~rmckenna>

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RESEARCH INTERESTS

Differential privacy, machine learning, numerical linear algebra, optimization, statistics

EDUCATION

MAY 2022 PhD in COMPUTER SCIENCE, **The University of Massachusetts, Amherst**

DEC 2018 MS in COMPUTER SCIENCE, **The University of Massachusetts, Amherst**

MAY 2016 BS in COMPUTER SCIENCE+MATHEMATICS, **The University of Delaware**

Summa Cum Laude, Degree With Distinction

CONFERENCE AND JOURNAL PAPERS

R. McKenna, S. Pradhan, D. Sheldon, G. Miklau. Relaxed Marginal Consistency for Differentially Private Query Answering. In proceedings of the 35th Conference on Neural Information Processing Systems (NeurIPS), 2021.

R. McKenna, G. Miklau, D. Sheldon. Winning the NIST Contest: A scalable and general approach to differentially private synthetic data. In Proceedings of the Journal of Privacy and Confidentiality (JPC) special issue on data challenges, 2021.

R. McKenna, D. Sheldon. Permute-and-Flip: A new mechanism for differentially private selection. In proceedings of the 34th Conference on Neural Information Processing Systems (NeurIPS), 2020.

R. McKenna, R. Maity, A. Mazumdar, G. Miklau. A workload-adaptive mechanism for linear queries under local differential privacy. In Proceedings of 46th International Conference on Very Large Data Bases (VLDB), 2020.

S. Kuppam, **R. McKenna**, D. Pujol, M. Hay, A. Machanavajjhala, G. Miklau. Fair decision making using privacy-protected data. In proceedings of the 3rd International conference on fairness, accountability, and transparency (FAT), 2020.

R. McKenna, D. Sheldon, G. Miklau. Graphical-model based estimation and inference for differential privacy. In proceedings of 36th International Conference on Machine Learning (ICML), 2019.

R. McKenna, G. Miklau, M. Hay, and A. Machanavajjhala. Optimizing error of high-dimensional statistical queries under differential privacy. In Proceedings of 44th International Conference on Very Large Data Bases (VLDB), 2018.

D. Zhang, **R. McKenna**, I. Kotsogiannis, G. Miklau, M. Hay, and A. Machanavajjhala. Ektelo: A Framework for Defining Differentially Private Computations. In Proceedings of Special Interest Group on Management of Data (SIGMOD), 2018.

G. Bernstein, **R. McKenna**, T. Sun, D. Sheldon, M. Hay, and G. Miklau. Differentially Private Learning of Undirected Graphical Models using Collective Graphical Models. In Proceedings of 34th International Conference on Machine Learning (ICML), 2017.

R. McKenna, S. Herbein, A. Moody, T. Gamblin, and M. Taufer. Machine Learning Predictions of Runtime and IO Traffic on High-end Clusters. In Proceedings of 2016 IEEE International Conference on Cluster Computing (CLUSTER), 2016.

R. McKenna, V. Pallipuram, R. Vargas, and M. Taufer. From HPC Performance to Weather Modeling: Transforming Methods for HPC Predictions Into Models of Extreme Climate Conditions. In the Proceedings of the Tenth IEEE International Conference on e-Science and Grid Technologies (eScience), August 31 – September 4, 2015. Munich, Germany.

C. Sahin, P. Tornquist, **R. McKenna**, Z. Pearson, and J. Clause. How Do Code Obfuscations Impact Energy Usage? In the Proceedings of the 30th International Conference on Software Maintenance and Evolution (ICSME). 2014, pp. 131–140.

ACHIEVEMENTS AND AWARDS

IN PROGRESS	405+ Project Euler problems solved (top 0.03%)
SEP 2021	CICS Dissertation writing fellowship
MAY 2021	2nd place in NIST differential privacy temporal map challenge
FEB 2020	1st place in NIST differential privacy synthetic data challenge
DEC 2019	Passed portfolio with distinction
JULY 2018	PiMLAI travel grant recipient
APRIL 2018	RSA Conference security scholar
MAY 2016	Outstanding senior award William D. Clark prize
NOV 2015	Experiencing HPC for Undergraduates travel grant (SC15)
MAY 2015	Outstanding junior award Carl Rees academic achievement scholarship
DEC 2014	32 points on Putnam exam (top 6% nationally)
MAY 2014	Outstanding sophomore award
SEP 2013	Rebecca W. McTerna presidential achievement scholarship
APR 2013	1st place in University of Delaware programming competition

INVITED AND CONTRIBUTED TALKS

(CONTRIBUTED, WORKSHOP), TPD, JULY 2021.

A practitioners guide to differentially private convex optimization. (6 of 88 accepted submissions selected for talk).

(INVITED). CICS THEORY SEMINARY, FEB 2021.

Permute-and-flip: a new mechanism for differentially private selection.

(CONTRIBUTED, SPOTLIGHT) NEURIPS, NOV 2020.

Permute-and-flip: a new mechanism for differentially private selection. (280 of 9454 submission selected for spotlight)

(INVITED) JSM, AUG 2020.

Generating Differentially-Private Synthetic Data with High Utility.

(CONTRIBUTED, WORKSHOP), TPD, NOV 2019.

Lessons learned from the NIST DP Synthetic Data Competition. (8 of 39 accepted submissions selected for talk).

(INVITED) DATA PRIVACY: FOUNDATIONS AND APPLICATIONS BOOT CAMP, FEB 2019.

Algorithms for Answering Linear Queries. (presented with Gerome Miklau and Sasho Nikolov)

(CONTRIBUTED, WORKSHOP) TPD, NOV 2018.

Optimizing Error of High-Dimensional Statistical Queries Under Differential Privacy. (5 of 26 accepted submissions selected for talk).

(CONTRIBUTED, WORKSHOP) PIMLAI, JULY 2018.

Graphical-model based estimation and inference for differential privacy. (6 of 33 accepted submissions selected for talk).

(INVITED) U.S. CENSUS BUREAU, MAY 2018.

Optimizing Error of High-Dimensional Statistical Queries Under Differential Privacy.

WORK EXPERIENCE

SEP 2016 - CURRENT	Research Assistant at UMass Amherst I am currently working in the Database Lab advised by Gerome Miklau and Dan Sheldon. I do both theoretical and empirical research on problems in differential privacy and machine learning.
MAY - AUG 2021	Science Intern at Tumult Labs, Remote Benchmarked and developed differentially private synthetic data algorithms.
JUNE - SEP 2020	Research Intern at Apple, Remote Worked with Kunal Talwar on practical approaches to differentially private convex optimization.
MAY - AUG 2019	Data Science Intern at Microsoft, Redmond WA Worked on the windows shell data science team and investigated techniques for generating synthetic data and learning under covariate shift.
JUN - SEP 2016	Software Engineering Intern at Google, Mountain View CA Worked on the Google Payments Team and contributed to their codebase to streamline common analysis tasks for fraud detection.
JUN - SEP 2015	Research Intern at Lawrence Livermore National Lab, Livermore CA Worked with Todd Gamblin to research the performance variability of the parallel file systems at LLNL.
SEP 2014 - MAY 2016	Undergraduate Researcher in the GCLab at The University of Delaware Worked with Michela Taufer in the global computing lab doing high-performance computing research
JUN - SEP 2014	Summer Intern at JP MORGAN CHASE & Co., Newark DE Created a web application to automate the process of database space allocation.
JAN - MAY 2014	Undergraduate Researcher in GreenSE Lab at the University of Delaware Worked with James Clause to explore the effects of code obfuscation tools on the energy consumption of mobile applications.
JAN 2013 - DEC 2015	Group Tutor at the University of Delaware Facilitated weekly group meetings and answer questions relating to labs, projects, or general concepts in math and computer science.

SERVICE

- Reviewer for PoPETS, TPDP, VLDB, SIGMOD, NeurIPS, AAAI, ICML, ICLR, TSC, JPC.
- Contributed blog post to the NIST Differential Privacy Blog Series: “Workloads of Counting Queries: Enabling Rich Statistical Analyses with Differential Privacy”.