

Jordan A. Awan

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RESEARCH INTERESTS

Formal Privacy

Theoretical and applied problems in differential privacy; Statistical Inference under formal privacy

Statistics

Functional Data Analysis; Nonparametric Statistics;

Analysis of Physiological Signals

Acoustic Analyses; Pitch Estimation

EDUCATION

Penn State University, University Park PA

Fall 2016-present

Doctor of Philosophy, Statistics

Advisors: Aleksandra Slavković and Matthew Reimherr

Brandeis University, Waltham MA

Fall 2014-Spring 2016

Master of Arts, Mathematics

Advisor: Olivier Bernardi

Clarion University of Pennsylvania, Clarion PA

Fall 2011-Spring 2014

Bachelor of Science, Mathematics

Minors: Computer Science, Honors

PROFESSIONAL CAREER

Harvard University, Center for Research on Computation and Society (CRCS), Cambridge MA

Summer 2018

Visiting Graduate Student

Advisor: Salil Vadhan

Penn State University, Department of Statistics, University Park PA

Summer 2017-present

Research Assistant

Advisor: Aleksandra Slavković

Lafayette College, Department of Mathematics, Easton PA

Summer 2013

REU participant

Advisor: Elizabeth McMahon

HONORS & AWARDS

PSU Statistics 50th Anniversary Best Poster Award

Spring 2018

August and Ruth Homeyer Graduate Fellowship

Fall 2017-Spring 2018

Best Performance on Applied Qualifying Exam, PSU Statistics

Summer 2017

Stephen B. Brumbach Distinguished Graduate Fellowship

Fall 2016-Spring 2017

GAANN Fellowship

Fall 2014-Summer 2016

MAA Outstanding Student Poster Award

Winter 2014

France-Allison Presentation Award

Fall 2013

MAA Outstanding Student Presentation Award

Summer 2013

Board of Governors Academic Tuition Scholarship

Fall 2011-Spring 2014

REFEREED PUBLICATIONS

Awan, J., Slavković, A. “Differentially Private Inference for Binomial Data.” arXiv:1904.00459. Under Revision.

Awan, J., Slavković, A. “Structure and Sensitivity in Differential Privacy: Comparing K -Norm Mechanisms.” arXiv:1801.09236. Under Revision.

Reimherr, M., **Awan, J.** (2019) “KNG: The K -Norm Gradient Mechanism.” *Advances in Neural Information Processing Systems 32*. Accepted.

Reimherr, M., **Awan, J.** (2019) “Elliptical Perturbations for Differential Privacy.” *Advances in Neural Information Processing Systems 32*. Accepted.

Awan, J., Bernardi, O. (2019) “Tutte Polynomials for Directed Graphs.” *Journal of Combinatorial Theory, Series B*. In press.

Awan, J., Kenney, A., Reimherr, M., Slavković A. (2019) “Benefits and Pitfalls of the Exponential Mechanism with Applications to Hilbert Spaces and Functional PCA.” *Proceedings of the 36th International Conference on International Conference on Machine Learning*, 97:374-384.

Awan, J., Slavković, A. (2018) “Differentially Private Uniformly Most Powerful Tests for Binomial Data.” *Advances in Neural Information Processing Systems 31*, 4208–4218.

Awan, S., **Awan, J.** (2018) “A Two-Stage Cepstral Analysis Procedure for the Classification of Rough Voices.” *Journal of Voice*. In press.

Gaskill, C., **Awan, J.**, Watts, C., Awan, S. (2016) “Acoustic and Perceptual Classification of Within-sample Normal, Intermittently Dysphonic, and Consistently Dysphonic Voice Types.” *Journal of Voice*, Volume 31, Issue 2, 218-228.

Awan, S., **Awan, J.** (2013) “The Effect of Gender on Measures of Electrolottographic Contact Quotient.” *Journal of Voice*, Volume 27, Issue 4, 433-440.

NON-REFEREED PUBLICATIONS

Awan, S., **Awan, J.**, Watts, C., S. Gaskill, C. (2017). “Response to Aichinger and Kubin Re: Letter to the Editor Acoustic and Perceptual Classification of Within-Sample Normal, Intermittently Dysphonic, and Consistently Dysphonic Voice Types.” *Journal of Voice* . 10.1016/j.jvoice.2017.06.001.

GRANT EXPERIENCE

NSF Grant Proposal: Formal Privacy for Complex Data Objects

Fall 2018

Helped to prepare the grant proposal (SES-1853209) with PIs Dr. Matthew Reimherr, Dr. Mark Shriver, and Dr. Aleksandra Slavković. Provided background on differential privacy and communicated preliminary work on private FPCA and elliptical distributions.

NIH R21 Grant Proposal: The Therapeutic Effects of a Variably Occluded Facemask in Patients with Voice Disorders

Fall 2019

Statistical consultant on the grant with PIs Dr. Amanda Gillespie and Dr. Shaheen Awan. Helped to design the experiment along with sample size estimates based on a preliminary study.

RESEARCH PRESENTATIONS

2019 Joint Statistical Meetings, Denver CO	Summer 2019
Analysis of the Exponential Mechanism with Applications to Hilbert Spaces and Functional PCA	
Proceedings of the 36th International Conference on International Conference on Machine Learning, Long Beach CA	Summer 2019
Analysis of the Exponential Mechanism with Applications to Hilbert Spaces and Functional PCA	
Simons Institute for the Theory of Computing, Berkeley, CA	April 2019
Differentially private UMP hypothesis tests for Bernoulli data	
Computational & Methodological Statistics Meeting in Pisa, Italy	December 2018
Differentially private UMP hypothesis tests for Bernoulli data	
2018 Joint Statistical Meetings, Vancouver British Columbia	July 2018
Optimizing finite sample performance under differential privacy	
Statistical Society of Canada Annual Meeting, McGill University, Montreal Quebec	June 2018
Optimizing finite sample performance under differential privacy	
Mathematical Foundations of Data Privacy, Banff International Research Station (BIRS), Banff CA	May 2018
Structure and Sensitivity in DP: Comparing K -Norm Mechanisms	
Stochastic Modeling and Computational Statistics Seminar, Penn State University	February 2018
Structure and Sensitivity in DP: Comparing K -Norm Mechanisms	
MIT Combinatorics Seminar	April 2016
Tutte polynomials for directed graphs and oriented matroids	
Brandeis Graduate Student Seminar	April 2016
Tutte polynomials for directed graphs and oriented matroids	
Brandeis Combinatorics Seminar	January 2016
Tutte polynomials for directed graphs and oriented matroids	
Brandeis Mathematics Graduate Student Seminar	Fall 2014
REU results on maximal caps and substructures in $AG(4, 3)$	
Pi Mu Epsilon Conference at Youngstown State University	Spring 2014
REU results on maximal caps and substructures in $AG(4, 3)$	
Joint Math Meetings in Baltimore Maryland	Winter 2014
REU results on maximal caps and substructures in $AG(4, 3)$	
Clarion University Honors Presentations	Fall 2013
Results on demicaps in $AG(4, 3)$	
Mathfest Conference in Hartford Connecticut	Summer 2013
REU results on maximal caps and substructures in $AG(4, 3)$	

POSTERS

Proceedings of the 36th International Conference on International Conference on Machine Learning, Long Beach CA	Summer 2019
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Analysis of the Exponential Mechanism with Applications to Hilbert Spaces
and Functional PCA

Thirty-second Conference on Neural Information Processing Systems Differentially Private Uniformly Most Powerful Tests for Binomial Data	December 2018
Theory and Practice of Differential Privacy in 25th ACM Conference on Computer and Communications Security Differentially Private Uniformly Most Powerful Tests for Binomial Data	October 2018
50th Anniversary Conference, Penn State University, Department of Statistics Optimizing finite sample performance under differential privacy	May 2018
Rao Prize Conference at Penn State University, PA Maximum Likelihood Estimation with Differential Privacy	May 2017
Joint Math Meetings in Baltimore Maryland REU results on maximal caps and substructures in $AG(4, 3)$	Winter 2014

OTHER PRESENTATIONS

Penn State Statistics Graduate Student Association Workshop Introduction to Differential Privacy	Fall 2018
Center for Research on Computation and Society, Harvard University Introduction to Differential Privacy	Summer 2018
Penn State Statistics Graduate Student Association Workshop Introduction to Differential Privacy	Fall 2017
Penn State DS 300: Privacy and Security for Data Sciences Introduction to Differential Privacy	Fall 2017
Brandeis Mathematics Graduate Student Seminar A proof of the 5 color theorem	Fall 2015
Brandeis Combinatorics Seminar Topics in matroid representability	Spring 2015
Brandeis Mathematics Graduate Student Seminar Topics regarding the Tutte polynomial	Spring 2015
Pi Mu Epsilon Conference at Youngstown State University A solution for the 2013 COMAP MCM problem A	Spring 2013
Clarion University High School Mathematics Competition Mental math algorithms with proofs and examples	Fall 2012
Cumberland Valley Math Modeling Challenge at Shippensburg University A model to predict the economic impacts of different voting systems	Fall 2011

TEACHING EXPERIENCE

Pennsylvania State University Department of Statistics, Instructor Introduction to Probability and Statistics with R	Spring 2019
Brandeis University Department of Mathematics, Instructor Calculus II	Fall 2015, Spring 2016
Brandeis University Department of Mathematics, Grader	Fall 2014, Spring 2015

Multivariate Calculus, Linear Algebra

Brandeis University Department of Mathematics, Tutor

Fall 2014, Spring 2015

Pre-Calculus, Calculus I & II

Clarion University Department of Academic Enrichment, Tutor

Fall 2011-Spring 2014

Finite Mathematics, Pre-Calculus, Calculus I & II, Linear Algebra

TECHNICAL SKILLS

Programming Languages

Proficient in: R; Latex; Java; C#; MATLAB/Scilab/Octave;

Familiar with: C/C++; Javascript; Mathematica