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 Electroglottographic 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 Bernouilli data

Computational & Methodological Statistics Meeting in Pisa, Italy — **December 2018**

Differentially private UMP hypothesis tests for Bernouilli 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**

Analysis of the Exponential Mechanism with Applications to Hilbert Spaces and Functional PCA

Thirty-second Conference on Neural Information Processing Systems — **December 2018**

Differentially Private Uniformly Most Powerful Tests for Binomial Data

Theory and Practice of Differential Privacy in 25th ACM Conference on Computer and Communications Security — **October 2018**

Differentially Private Uniformly Most Powerful Tests for Binomial Data

50^{th} Anniversary Conference, Penn State University, Department of Statistics — **May 2018**

Optimizing finite sample performance under differential privacy

Rao Prize Conference at Penn State University, PA — **May 2017**

Maximum Likelihood Estimation with Differential Privacy

Joint Math Meetings in Baltimore Maryland — **Winter 2014**

REU results on maximal caps and substructures in $AG(4, 3)$

OTHER PRESENTATIONS

Penn State Statistics Graduate Student Association Workshop — **Fall 2018**

Introduction to Differential Privacy

Center for Research on Computation and Society, Harvard University — **Summer 2018**

Introduction to Differential Privacy

Penn State Statistics Graduate Student Association Workshop — **Fall 2017**

Introduction to Differential Privacy

Penn State DS 300: Privacy and Security for Data Sciences — **Fall 2017**

Introduction to Differential Privacy

Brandeis Mathematics Graduate Student Seminar — **Fall 2015**

A proof of the 5 color theorem

Brandeis Combinatorics Seminar — **Spring 2015**

Topics in matroid representability

Brandeis Mathematics Graduate Student Seminar — **Spring 2015**

Topics regarding the Tutte polynomial

Pi Mu Epsilon Conference at Youngstown State University — **Spring 2013**

A solution for the 2013 COMAP MCM problem A

Clarion University High School Mathematics Competition — **Fall 2012**

Mental math algorithms with proofs and examples

Cumberland Valley Math Modeling Challenge at Shippensburg University — **Fall 2011**

A model to predict the economic impacts of different voting systems

TEACHING EXPERIENCE

Pennsylvania State University Department of Statistics, Instructor **Spring 2019**
Introduction to Probability and Statistics with R

Brandeis University Department of Mathematics, Instructor **Fall 2015, Spring 2016**
Calculus II

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