Joshua Agterberg

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EDUCATION

2017-Present **Johns Hopkins University**
2019-Present PhD in Applied Mathematics and Statistics
2017-2019 Master of Science in Engineering in Applied Mathematics and Statistics
Advised by Professor Carey Priebe

2013-2017 **University of Wisconsin-Madison**
Bachelor of Business Administration, Majors in Actuarial Science and Mathematics
Advised by Professor Marjorie Rosenberg
GPA: 3.73/4.0, Actuarial Science Major GPA: 4.0/4.0
Graduated with Distinction

RESEARCH INTERESTS

- Statistical Network Analysis
- High-dimensional Statistics
- Spectral Methods
- Mathematical Data Science
- Nonparametric Statistics

PREPRINTS AND PUBLICATIONS

1. *Entrywise Estimation of Singular Vectors of Low-Rank Matrices with Heteroskedasticity and Dependence*
Joshua Agterberg, Zachary Lubberts, and Carey Priebe, Submitted, 2021.

2. *Valid Two-Sample Graph Testing via Optimal Transport Procrustes and Multiscale Graph Correlation: Applications in Connectomics*
Jaewon Chung, Bijan Varjavand, Jesús Arroyo, Anton Alyakin, **Joshua Agterberg**, Minh Tang, Joshua Vogelstein, and Carey Priebe, Submitted, 2021.

3. *Nonparametric Two-Sample Hypothesis Testing for Random Graphs with Negative and Repeated Eigenvalues*
Joshua Agterberg, Minh Tang, and Carey Priebe, Submitted, 2020.
(Won best presentation award in Nonparametric Statistics Student Competition, JSM 2021)
(Selected as a finalist for the Nonparametric Statistics Student Competition, JSM 2021.)

4. *Correcting a Nonparametric Two-sample Graph Hypothesis Test for Graphs with Different Numbers of Vertices*
Anton Alyakin, **Joshua Agterberg**, Hayden Helm, and Carey Priebe, Submitted, 2020.

5. *On Two Distinct Sources of Nonidentifiability in Latent Position Random Graph Models*
Joshua Agterberg, Minh Tang, and Carey Priebe, Submitted, 2020.

6. *Spectral Graph Clustering via the Expectation-Solution Algorithm*
Zachary Pisano, **Joshua Agterberg**, Carey Priebe, and Daniel Naiman, Submitted, 2020.

7. *Vertex Nomination, Consistent Estimation, and Adversarial Modification*
Joshua Agterberg, Youngser Park, Jonathan Larson, Chris White, Carey Priebe, and Vince Lyzinski, Published in the *Electronic Journal of Statistics*, 2020.

8. *Social Determinant-Based Profiles of US Adults with the Highest and Lowest Health Expenditures Using Clusters*
Fanghao Zhong, Margie Rosenberg, **Joshua Agterberg**, and Richard Crabb, Published in *North American Actuarial Journal*, 2020.

9. *Cluster Analysis Application to Identify Groups of Individuals with High Health Expenditures*
Joshua Agterberg, Fanghao Zhong, Richard Crabb, and Margie Rosenberg, Published in *Health Services and Outcomes Research Methodology*, 2020.

TALKS

9/21/2021 "Entrywise Estimation of Singular Vectors of Low-Rank Matrices with Heteroskedasticity and Dependence," *Applied Mathematics and Statistics Student Seminar*, JHU

8/10/2021 "Nonparametric Two-Sample Hypothesis Testing for Random Graphs with Negative and Repeated Eigenvalues," *Joint Statistical Meetings*, ~~Seattle, WA~~Virtual
(**Received Best Presentation Award in the Nonparametric Statistics Student Competition**)

2/2/2021 "Nonparametric Two-Sample Hypothesis Testing for Random Graphs with Negative and Repeated Eigenvalues," *Applied Mathematics and Statistics Student Seminar*, JHU

8/6/2020 "Consistent Nonparametric Hypothesis Testing for Low Rank Random Graphs with Negative and Repeated Eigenvalues," *Joint Statistical Meetings*, ~~Philadelphia, PA~~Virtual

4/7/2020 "Nonidentifiability and nonparametric random graph hypothesis testing," *MINDS Seminar*, JHU

1/28/2020 "On Two Distinct Sources of Nonidentifiability in Latent Position Random Graph Models," *Applied Mathematics and Statistics Student Seminar*, JHU

4/23/2019 "Vertex Nomination, Consistent Estimation, Adversarial Modification," *Applied Mathematics and Statistics Student Seminar*, JHU

HONORS AND AWARDS

Johns Hopkins University

Summer 2021	Best Presentation Award, JSM Student Competition in Nonparametric Statistics
Spring 2021	IMS (Institute of Mathematical Statistics) Hannan Graduate Student Travel Award
Spring 2021	MINDS (Mathematical Institute of Data Science) Fellowship
Spring 2021	Finalist for JSM Student Competition in Nonparametric Statistics
2021-Present	Applied Mathematics and Statistics Teaching Fellow
2020-2021	Applied Mathematics and Statistics Apprentice Teaching Fellow
2019-Present	Charles and Catherine Counselman Fellowship
Spring 2020	MINDS (Mathematical Institute of Data Science) Fellowship

University of Wisconsin-Madison

Spring 2017	Graduated with distinction
Spring 2017	DW Simpson Scholarship
Fall 2016	Bicknell Scholarship
2013-2014	Arthur C. Nielsen Scholarship
2013	Directly Admitted to Wisconsin School of Business
2014-2017	Deans list (>3.8 Semester GPA achieved five separate times)

TEACHING

Johns Hopkins University

Fall 2021	Instructor for HEART Course: Statistics and Data Science with Networks
Summer 2021	Instructor for Masters Program Statistics Review
Winter 2021	Instructor for 553.283 Introduction to R
Summer 2020	Instructor for Masters Program Statistics Review
Summer 2020	Teaching Assistant for 553.310 Probability and Statistics for Vittorio Loprinzo
Fall 2019	Co-created a topics course in probability with another graduate student
Summer 2019	Instructor for Masters Program Statistics Review
Summer 2019	Teaching Assistant for 553.310 Probability and Statistics for Vittorio Loprinzo
Spring 2019	Teaching Assistant for 553.762 Nonlinear Optimization II for Professor Daniel Robinson
Fall 2018	Teaching Assistant for 553.730 Statistical Theory for Professor Carey Priebe
Summer 2018	Instructor for Financial Mathematics Masters Program Statistics Review

University of Wisconsin-Madison (Wisconsin School of Business, Risk and Insurance)

Spring 2017	Grader for ActSci 655 Health Analytics for Professor Margie Rosenberg
Fall 2016	Grader for ActSci 651 Life Contingencies II for Professor Paul Johnson
Spring 2016	Grader for ActSci 650 Life Contingencies I for Professor Margie Rosenberg

University of Wisconsin-Madison (School of Music)

Spring 2015-Spring 2017	Private Piano Instructor

PROFESSIONAL SERVICE

Member	ASA, IMS
Reviewer	IEEE Transactions on Pattern Analysis and Machine Intelligence
Co-Organizer	Fall 2021 reading group on deep and graph learning
Organizer	Summer 2021 reading group on eigenvectors and random graph inference
Organizer	2020-2021 Johns Hopkins Applied Mathematics and Statistics student seminar
Member	Fall 2020 Graduate student committee to meet with potential JHU AMS tenure-track faculty
Speaker	Fall 2020 reading group on theoretical foundations of data science
Organizer	Summer 2020 reading group on eigenvectors and random graph inference
Member	Fall 2019 Graduate student committee to meet with potential JHU AMS faculty head

EXPERIENCE

2018 - Present **Research Assistant**, Johns Hopkins University, Baltimore, MD

Research assistant to Professor Carey Priebe in the Applied Mathematics and Statistics Department.

Summer 2017 **Analytics Intern**, CNA Financial, Chicago, IL

Analyzed loss data for products and professional liability for medical devices using new FDA data and GLMs.

Summer 2016 **Actuarial Intern**, CNA Financial, Chicago, IL

Developed a model for predicting the probability of payment for insurance.

Summer 2015 **Actuarial Intern**, CUNA Mutual Group, Madison, WI

Created spreadsheets to replicate GAAP and Statutory reserves results from PolySystems for equity-indexed annuity policies and analyzed mortality experience data for the purposes of creating a new mortality table.

TECHNICAL QUALIFICATIONS

Skills

Proficient in R, Java, Python, Linux, Git, C++ (Rcpp), Matlab, LaTeX, Microsoft Excel, and VBA
Passed three actuarial exams (P, FM, and MFE)

Quantitative Coursework

Johns Hopkins University

Probability Theory I and II, Statistical Theory I and II, Nonlinear Optimization I and II, Combinatorial Optimization, Matrix Analysis, Topics in Statistical Pattern Recognition, Statistical Inference on Random Graphs, Riemannian Geometry I and II, Complex Variables, Functional Analysis, Topics

in Probability (co-organized), Sparse Representations in Computer Vision and Machine Learning, Harmonic Analysis, Partial Differential Equations

University of Wisconsin-Madison

Real Analysis I and II, Measure Theory, Actuarial Mathematics, Loss Models I and II, Linear Programming, Numerical Analysis, Stochastic Processes, Stochastic Calculus, Linear Regression, Theory of Probability

HOBBIES

Playing jazz piano, playing with synthesizers, reading fantasy, hiking, and biking