

JOHN URSCHHEL

CONTACT INFORMATION

Department of Mathematics,
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CURRENT APPOINTMENTS

Doctoral Candidate *2016 - Present*
Department of Mathematics,
Massachusetts Institute of Technology

EDUCATION

Ph.D. in Mathematics *expected 2020*
Massachusetts Institute of Technology

M.A. in Mathematics *2013*
Penn State University

B.S. in Mathematics *2012*
Penn State University

PRIOR WORK EXPERIENCE

NFL Football Player *2014 - 2017*
Baltimore Ravens,
National Football League

Instructor *2013*
Department of Mathematics,
Penn State University

AWARDS AND HONORS

Academic
MIT Dean of Science Fellow, 2016-2018
Forbes 30 Under 30, Science, 2017
Student Marshall for Mathematics Graduation Ceremony, 2012
Kermit Anderson Award in Mathematics, 2012

Evan Johnson Memorial Scholarship in Mathematics, 2011

Athletic

Sullivan Award, 2014

Campbell Trophy, 2013

Associated Press All-American, 2013

ACTIVE RESEARCH AREAS

Convex Geometry, Graph Theory, Machine Learning, Numerical Analysis.

PUBLICATIONS

1. John C. Urschel, Jake Wellens. Testing k -Planarity is NP-Complete, Preprint, arXiv:1907.02104.
2. Victor-Emmanuel Brunel, Ankur Moitra, Philippe Rigollet, John C. Urschel. Maximum Likelihood Estimation of Determinantal Point Processes, Preprint, arXiv:1701.06501.
3. John C. Urschel. Nodal Decompositions of Graphs, *Linear Algebra and its Applications*, Volume 539, 15 February 2018, Pages 60-71.
4. John C. Urschel. On the Characterization and Uniqueness of Centroidal Voronoi Tessellations, *SIAM Journal on Numerical Analysis*, 55(3), 1525-1547, 2017.
5. John C. Urschel, Victor-Emmanuel Brunel, Ankur Moitra, Phillippe Rigollet. Learning Determinantal Point Processes with Moments and Cycles, *International Conference on Machine Learning (ICML)*, 2017.
6. Victor-Emmanuel Brunel, Ankur Moitra, Philippe Rigollet, John Urschel. Rates of Estimation for Determinantal Point Processes, *Conference on Learning Theory (COLT)*, 2017.
7. Xiaozhe Hu, John C. Urschel, Ludmil T. Zikatanov. On the Approximation of Laplacian Eigenvalues in Graph Disaggregation, *Linear and Multilinear Algebra*, 65(9): 1805-1822, 2017.
8. John C. Urschel, Ludmil T. Zikatanov. On the Maximal Error of Spectral Approximation of Graph Bisection, *Linear and Multilinear Algebra*, 64(10): 1972-1979, 2016.
9. John C. Urschel, Xiaozhe Hu, Jinchao Xu, Ludmil Zikatanov. A Cascadic Multigrid Algorithm for Computing the Fiedler Vector of Graph Laplacians, *Journal of Computational Mathematics*, Vol. 33 No. 2, 2015, 209-226.
10. John C. Urschel, Ludmil T. Zikatanov. Spectral Bisection of Graphs and Connectedness, *Linear Algebra and its Applications*, Volume 449, 15 May 2014, Pages 1-16.
11. John C. Urschel. A Space-Time Multigrid Method for the Numerical Valuation of Barrier Options, *Communications in Mathematical Finance*, vol. 2, no. 3, 2013, 1-20.
12. John C. Urschel, Joseph R. Galante. Instabilities in the Sun-Jupiter-Asteroid Three Body Problem, *Celestial Mechanics and Dynamical Astronomy*, March 2013, Volume 115, Issue 3, pp 233-259.

INVITED TALKS

1. Nodal Decompositions of Graphs, Special Session on Recent Trends in Algebraic Graph Theory, AMS Spring Central and Western Joint Sectional Meeting, March 2019.

2. Randomized Solvers, Recent Advances in Multilevel Solvers Mini-Symposium, SIAM Conference on Computational Science and Engineering, February 2019.
3. On the Approximation of Laplacian Eigenvalues in Graph Disaggregation, Mathematics Colloquium, University of Washington, March 2017.
4. Trace Theorems and Drawings of Planar Graphs, Discrete Mathematics Seminar, University of Delaware, March 2017.
5. Learning Determinantal Point Processes with Moments and Cycles, Computational and Applied Mathematics Colloquium, Penn State University, February 2017.
6. Existence and Uniqueness of Centroidal Voronoi Tessellations, Scientific Computing Colloquium, Florida State University, July 2016.
7. Voronoi Tessellations in Today's World, Guterman Lecture, Tufts University, April 2016.
8. A Cascadic Multigrid Algorithm for Computing the Fiedler Vector of Graph Laplacians, CryptoMathematics Institute Mathfest, National Security Agency, June 2015.
9. Spectral Bisection of Graphs and Connectedness, Mathematics Colloquium, University of Maryland, April 2015.

TEACHING

Math 18.03: Differential Equations, Massachusetts Institute of Technology *Spring 2018*

Role: Recitation Instructor

Subject Evaluation Report: Recitation Instructor 6.9/7

Math 232: Integral Vector Calculus, Penn State University *Fall 2013*

Role: Lecturer

Student Rating of Teaching Effectiveness: Course 6.14/7; Instructor 6.71/7

Math 041: Trigonometry and Analytic Geometry, Penn State University *Spring 2013*

Role: Lecturer

Student Rating of Teaching Effectiveness: Course 6.06/7; Instructor 6.59/7

Econ 490: Introduction to Econometrics, Penn State University *Spring 2012*

Role: Teacher's Assistant