

Ryan Slechta

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Research Interests

Computational Topology; Combinatorial Dynamical Systems

Education

- 2020 Master of Science, Computer Science and Engineering
The Ohio State University, Columbus, Ohio
- 2016 Bachelor of Arts, *summa cum laude*, Mathematics, Computer Science
University of St. Thomas, St. Paul, Minnesota

Appointments

- 2020-Present Graduate Research Assistant, Purdue University
- 2017-2020 Graduate Research Associate, The Ohio State University
- 2016-2017 University Fellow, The Ohio State University
- 2015-2016 Research Assistant, Los Alamos National Laboratory
- 2014-2015 Research Assistant, University of Minnesota
- 2013-2014 Research Assistant, University of St. Thomas

Grants, Honors, & Awards

- 2016-2017 University Fellowship, The Ohio State University
- 2012-2016 Deans List (each semester), University of St. Thomas
- 2012-2016 Aquinas Scholars Honors Program, University of St. Thomas
- 2015 Barry M. Goldwater Scholarship, Honorable Mention, Goldwater Foundation
- 2014 Collaborative Inquiry Grant, University of St. Thomas
- 2014 MAA Outstanding Presentation Award, MAA at MathFest
- 2012 Collaborative Inquiry Grant, University of St. Thomas

Publications

CONFERENCE PROCEEDINGS

- 2020 T. K. Dey, M. Mrozek, and R. Slechta. “Persistence of the Conley Index in Combinatorial Dynamical Systems.” Presented at the 36th International Symposium on Computational Geometry (SoCG).
- 2019 T. K. Dey and R. Slechta. “Filtration Simplification for Persistent Homology via Edge Contraction.” Presented at the 21st International Conference on Discrete Geometry for Computer Imagery (DGCI).
- 2018 T. K. Dey and R. Slechta. “Edge Contraction in Persistence-Generated Discrete Morse Vector Fields.” Presented at Shape Modeling International 2018 (SMI).
- 2017 R. Slechta, L. Monroe, N. DeBardeleben, Q. Guan, J. Wendelberger, and S. Michalak. “Resilience Analysis of Top K Selection Algorithms.” Presented at the 13th European Dependable Computing Conference (EDCC).
- 2014 R. Slechta, J. Sawin, B. McCamish, D. Chiu, and G. Canahuat. “Optimizing Query Execution for Variable-Aligned Length Compression of Bitmap Indices.” Presented at the 18th International Database Engineering and Applications Symposium (IDEAS).

JOURNAL ARTICLES

NB: Papers in conference proceedings that are published in journals are excluded from this section. Extended versions of conference papers are included.

- 2020 T. K. Dey and R. Slechta. “Filtration Simplification for Persistent Homology via Edge Contraction.” In Journal of Mathematical Imaging and Vision, Volume 62, Issue 5.
- 2020 G. Damiand, E. Paluzo-Hidalgo, R. Slechta, and R. Gonzalez-Diaz. “Approximating Lower-Star Persistence via 2D Combinatorial Map Simplification.” In Pattern Recognition Letters, Volume 131.
- 2016 A. Grim, T. O’Connor, P. J. Olver, C. Shakiban, R. Slechta, and R. Thompson. “Automatic Re-assembly of Three-Dimensional Jigsaw Puzzles.” In International Journal of Image and Graphics, Volume 16, Issue 2.

Selected Talks

- 2020 “Persistence of the Conley Index in Combinatorial Dynamical Systems.” Computational Mathematics Seminar, Jagiellonian University. October 15.
- 2020 “Persistence of the Conley Index in Combinatorial Dynamical Systems.” Second Symposium on Machine Learning and Dynamical Systems, Fields Institute, September 29.
- 2019 “Filtration Simplification for Persistent Homology via Edge Contraction.” Ohio TDA Day, Dayton, Ohio. July 29.
- 2018 “Filtration Simplification for Persistent Homology via Edge Contraction.” Topology, Geometry, and Data Analysis Seminar, The Ohio State University. October 30.
- 2016 “Resilience of a Top K Selection Algorithm.” USRC Research Symposium, Los Alamos National Laboratory. August 4.
- 2015 “Reassembling Humpty Dumpty: 3D Puzzles and Invariant Signature Curves.” Joint Mathematics Meeting, San Antonio, Texas. January 10.

- 2014 “Reassembling Humpty Dumpty: 3D Puzzles and Invariant Signature Curves.” Math Physics Seminar, University of Minnesota. November 19.
- 2014 “Reassembling Humpty Dumpty: 3D Puzzles and Invariant Signature Curves.” MathFest, Portland, Oregon. August 7.

Service

- 2019-2020 Senator, University Senate, The Ohio State University
- 2019-2020 Member, Council on Academic Affairs, The Ohio State University
- 2019-2020 Member, CAA — Graduate Council Joint Subcommittee, The Ohio State University
- 2018-2019 Chair, Bylaws Committee, Council of Graduate Students, The Ohio State University
- 2016-2020 Delegate, Council of Graduate Students, The Ohio State University
- 2017-2018 Member, Core Curriculum Committee, College of Engineering, The Ohio State University