

# Erin Wolf Chambers

## Curriculum Vitæ

Department of Computer Science  
Saint Louis University  
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## Research Interests

Computational topology and geometry, graph theory, combinatorics and combinatorial algorithms, recruitment and retention in computer science.

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## Education

Ph.D. in Computer Science (August 2008)  
University of Illinois at Urbana-Champaign  
Advisor: Jeff Erickson

M.S. in Mathematics (May 2006)  
University of Illinois at Urbana-Champaign

B.S. in Computer Science (May 2002)  
Minor in Mathematics  
University of Illinois at Urbana-Champaign

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## Professional Experience

**Professor (with tenure)** **July 2024–present**  
*Department of Computer Science and Engineering, University of Notre Dame*  
*Concurrent Appointment in Department of Applied and Computational Mathematics and Statistics*  
*South Bend, IN*

**Chair** **July 2022–June 2024**  
**Associate chair** **August 2019–June 2022**  
**Professor (with tenure)** **August 2018–present**  
**Associate Professor (with tenure)** **Fall 2013–July 2018**  
*Department of Computer Science, Saint Louis University*  
*Secondary Appointment in Department of Mathematics and Statistics* *St. Louis, MO*

**Assistant Professor** **Fall 2008–Spring 2013**  
*Department of Mathematics and Computer Science, Saint Louis University* *St. Louis, MO*

**Visiting Research Professor** **Summer 2011**  
*Informatics Department, Saarland University* *Saarbrücken, Germany*

**Research Assistant** **Summer 2006, August 2007–August 2008**  
**Teaching Assistant** **Fall 2005, Spring 2006**  
**CS273 Visiting Lecturer** **Summer 2003 and 2004**  
*Department of Computer Science, University of Illinois* *Urbana, IL*

**Research Experience for Undergraduates (REU) Participant** **Summer 2002**  
*Math Department, University of Illinois* *Urbana, IL*  
Supervisor: Dr. A. J. Hildebrand

**Co-op** **January 2001 - August 2001**  
*CIRAS Program Office, Central Intelligence Agency* *Washington D.C.*

**Intern** **Summer 2000**  
*Network Public Access Group, John Deere* *Moline, IL*

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## Awards and Honoraries

### Research and Academic Honors

- Simons Visiting Professorship (at Oberwolfach), 2015
  - National Science Foundation CAREER Award, 2011-2016
  - NSF Graduate Research Fellowship 2002-2007
  - SURGE (Support for Under-Represented Groups in Engineering) Fellowship, 2002-2007
  - Chancellor's Scholar and James Scholar at UIUC, 1998-2002
  - Lockheed Martin Scholarship, 2001
  - Spyglass Scholarship, 1999
  - National Merit Scholar and Illinois State Scholar, 1998
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# Publications

## Journal Articles

1. Frederik Brüning, Hugo Akitaya, Erin Chambers, and Anne Driemel. Subtrajectory clustering: Finding set covers for set systems of subcurves. *Computing in Geometry and Topology*, page Vol. 2 No. 1 (2023), 2023
2. Erin W. Chambers, Jeff Erickson, Kyle Fox, and Amir Nayyeri. Minimum cuts in surface graphs. *SIAM Journal on Computing*, 52(1):156–195, 2023
3. Maike Buchin, Erin Chambers, Pan Fang, Brittany Terese Fasy, Ellen Gasparovic, Elizabeth Munch, and Carola Wenk. Distances between immersed graphs: Metric properties. *La Matematica*, 2(1):197–222, January 2023
4. Levent Batakci, Abigail Branson, Bryan Castillo, Candace Todd, Erin Chambers, and Elizabeth Munch. Comparing embedded graphs using average branching distance. Accepted to INVOLVE, a Journal of Mathematics, 2022
5. Erin Wolf Chambers, Francis Lazarus, Arnaud de Mesmay, and Salman Parsa. Algorithms for contractibility of compressed curves on 3-manifold boundaries. *Discrete & Computational Geometry, Special issue from SoCG 2021*, July 2022
6. Kristine Bauer, Erin Wolf Chambers, Brenda Johnson, Kristin E. Lauter, and Kathryn Leonard. Research networks for women. *European Mathematical Society Magazine*, (126):41–50, October 2022
7. Dena Bazazian, Bonnie Magland, Cindy Grimm, Erin Chambers, and Kathryn Leonard. Perceptually grounded quantification of 2d shape complexity. *The Visual Computer*, August 2022
8. Dan Zeng, Erin Chambers, David Letscher, and Tao Ju. Topological simplification of nested shapes. *Computer Graphics Forum (Proceedings of SGP 2022)*, 41, 2022
9. Dan Zeng, Mao Li, Ni Jiang, Yiwen Ju, Hannah Schreiber, Erin Chambers, David Letscher, Tao Ju, and Christopher N. Topp. TopoRoot: a method for computing hierarchy and fine-grained traits of maize roots from 3d imaging. *Plant Methods*, 17(1), December 2021
10. Erin Wolf Chambers, Gregory R. Chambers, Arnaud de Mesmay, Tim Ophelders, and Regina Rotman. Constructing monotone homotopies and sweepouts. *Journal of Differential Geometry*, 119(3):383 – 401, 2021
11. Dan Zeng, Erin Chambers, David Letscher, and Tao Ju. To cut or to fill: a global optimization approach to topological simplification. *ACM Transactions on Graphics (Proc. ACM Siggraph Asia 2020)*, 39(6):1–18, 2020
12. Erin Chambers, Brittany Terese Fasy, Yusu Wang, and Carola Wenk. Map-matching using shortest paths. *ACM Transactions on Spatial Algorithms and Systems (TSAS)*, 6(1):1–17, 2020. Extended abstract appeared in the Workshop on Interactive and Spatial Computing, 2018

13. Erin Wolf Chambers and Yusu Wang. Measuring similarity between curves on 2-manifolds via homotopy area. *Journal of Computational Geometry*, Vol 10:No 1 (2019), 2019. Extended abstract appeared in the Symposium on Computational Geometry, 2013
14. Erin W Chambers, Sándor P Fekete, Hella-Franziska Hoffmann, Dimitri Marinakis, Joseph SB Mitchell, Venkatesh Srinivasan, Ulrike Stege, and Sue Whitesides. Connecting a set of circles with minimum sum of radii. *Computational Geometry: Theory and Applications*, 68:62–76, 2018. Extended abstract appeared in the Workshop on Algorithms and Data Structures, 2011
15. Glencora Borradaile, Erin Wolf Chambers, Kyle Fox, and Amir Nayyeri. Minimum cycle and homology bases of surface-embedded graphs. *Journal of Computational Geometry*, 8(2):58–79, 2017. Extended abstract appeared in the Symposium on Computational Geometry, 2016
16. Tanya L Crenshaw, Erin W Chambers, Cinda Heeren, and Heather E Metcalf. Ten years toward equity: Preliminary results from a follow-up case study of academic computing culture. *Frontiers in psychology*, 8:816, 2017
17. Yajie Yan, Kyle Sykes, Erin Chambers, David Letscher, and Tao Ju. Erosion thickness on medial axes of 3d shapes. *ACM Transactions on Graphics (Proceedings of ACM Siggraph 2016)*, 35(4):1–12, 2016
18. Erin Wolf Chambers and Mikael Vejdemo-Johansson. Computing minimum area homologies. *Computer Graphics Forum*, 34(6):13–21, 2015
19. Erin W Chambers, Di Fang, Kyle A Sykes, Cynthia M Traub, and Philip Trettenero. The zipper foldings of the diamond. *Involve, a Journal of Mathematics*, 8(3):521–534, 2015
20. Erin W Chambers, Kyle Fox, and Amir Nayyeri. Counting and sampling minimum cuts in genus  $g$  graphs. *Discrete & Computational Geometry*, 52(3):450–475, 2014. Extended abstract appeared in the Symposium on Computational Geometry, 2013
21. Glencora Borradaile and Erin Wolf Chambers. Covering nearly surface-embedded graphs with a fixed number of balls. *Discrete & Computational Geometry*, 51(4):979–996, 2014
22. Sergio Cabello, Erin W Chambers, and Jeff Erickson. Multiple-source shortest paths in embedded graphs. *SIAM Journal on Computing*, 42(4):1542–1571, 2013
23. Erin Wolf Chambers and David Eppstein. Flows in one-crossing-minor-free graphs. *Journal of Graph Algorithms and Applications*, 17(3):201–220, 2013. Extended abstract appeared in International Symposium on Algorithms and Computation, 2010
24. Erin W. Chambers, David Eppstein, Michael T. Goodrich, and Maarten Löffler. Drawing graphs in the plane with a prescribed outer face and polynomial area. *Journal of Graph Algorithms and Applications*, 16(2):243–259, 2012. Extended abstract appeared in the Symposium on Graph Drawing, 2010
25. Erin W Chambers, Jeff Erickson, and Amir Nayyeri. Homology flows, cohomology cuts. *SIAM Journal on Computing*, 41(6):1605–1634, 2012. Extended abstract appeared in the ACM Symposium on Theory of Computing, 2009

26. Lu Liu, Erin W Chambers, David Letscher, and Tao Ju. Extended grassfire transform on medial axes of 2d shapes. *Computer-Aided Design (Proceedings of SPM 2011)*, 43(11):1496–1505, 2011
27. Erin W Chambers, Vin De Silva, Jeff Erickson, and Robert Ghrist. Vietoris–rips complexes of planar point sets. *Discrete & Computational Geometry*, 44(1):75–90, 2010
28. L. Liu, E. W. Chambers, D. Letscher, and T. Ju. A simple and robust thinning algorithm on cell complexes. *Computer Graphics Forum*, 29(7):2253–2260, 2010
29. Erin Wolf Chambers, Eric Colin De Verdiere, Jeff Erickson, Sylvain Lazard, Francis Lazarus, and Shripad Thite. Homotopic fréchet distance between curves or, walking your dog in the woods in polynomial time. *Computational Geometry: Theory and Applications*, 43(3):295–311, 2010. Extended abstract appeared in Symposium on Computational Geometry, 2008
30. Erin W Chambers, Bill Kinnersley, Noah Prince, and Douglas B West. Extremal problems for roman domination. *SIAM Journal on Discrete Mathematics*, 23(3):1575–1586, 2009
31. Erin W Chambers, Éric Colin De Verdière, Jeff Erickson, Francis Lazarus, and Kim Whittlesey. Splitting (complicated) surfaces is hard. *Computational Geometry: Theory and Applications*, 41(1-2):94–110, 2008. Extended abstract appeared in Symposium on Computational Geometry, 2006
32. David P Bunde, Erin W Chambers, Daniel Cranston, Kevin Milans, and Douglas B West. Pebbling and optimal pebbling in graphs. *Journal of Graph Theory*, 57(3):215–238, 2008

#### **Refereed Conference Papers (without a corresponding journal publication)**

24. Erin Chambers, Brittany Fast, Benjamin Holmgren, Sushovan Majhi, and Carola Wenk. Metric and path-connectedness properties of the fréchet distance for paths and graphs. In *Canadian Conference on Computational Geometry*, 2023
25. Erin Chambers, Moon Duchin, Ranthony A. C. Edmonds, Parker Edwards, J N Matthews, Anthony E. Pizzimenti, Chanel Richardson, Parker Rule, and Ari Stern. Aggregating community maps. In *Proceedings of the 30th International Conference on Advances in Geographic Information Systems*. ACM, November 2022
26. Erin Wolf Chambers, Salman Parsa, and Hannah Schreiber. On Complexity of Computing Bottleneck and Lexicographic Optimal Cycles in a Homology Class. In Xavier Goaoc and Michael Kerber, editors, *38th International Symposium on Computational Geometry (SoCG 2022)*, volume 224 of *Leibniz International Proceedings in Informatics (LIPIcs)*, pages 25:1–25:15, Dagstuhl, Germany, 2022. Schloss Dagstuhl – Leibniz-Zentrum für Informatik
27. Erin W. Chambers, Christopher Fillmore, Elizabeth Stephenson, and Mathijs Wintraecken. A cautionary tale: Burning the medial axis is unstable (media exposition). In Xavier Goaoc and Michael Kerber, editors, *38th International Symposium on Computational Geometry, SoCG 2022, June 7-10, 2022, Berlin, Germany*, volume 224 of *LIPIcs*, pages 66:1–66:9. Schloss Dagstuhl - Leibniz-Zentrum für Informatik, 2022

28. Erin Wolf Chambers, Elizabeth Munch, and Tim Ophelders. A Family of Metrics from the Truncated Smoothing of Reeb Graphs. In Kevin Buchin and Éric Colin de Verdière, editors, *37th International Symposium on Computational Geometry (SoCG 2021)*, volume 189 of *Leibniz International Proceedings in Informatics (LIPIcs)*, pages 22:1–22:17, Dagstuhl, Germany, 2021. Schloss Dagstuhl – Leibniz-Zentrum für Informatik
29. Erin Wolf Chambers, Jeff Erickson, Patrick Lin, and Salman Parsa. How to morph graphs on the torus. In *Proceedings of the Thirty-Second Annual ACM-SIAM Symposium on Discrete Algorithms, SODA '21*, page 2759–2778, USA, 2021. Society for Industrial and Applied Mathematics
30. Glencora Borradaile, Erin Wolf Chambers, David Eppstein, William Maxwell, and Amir Nayyeri. Low-Stretch Spanning Trees of Graphs with Bounded Width. In Susanne Albers, editor, *17th Scandinavian Symposium and Workshops on Algorithm Theory (SWAT 2020)*, volume 162 of *Leibniz International Proceedings in Informatics (LIPIcs)*, pages 15:1–15:19, Dagstuhl, Germany, 2020. Schloss Dagstuhl–Leibniz-Zentrum für Informatik
31. Therese Biedl, Erin Wolf Chambers, David Eppstein, Arnaud De Mesmay, and Tim Ophelders. Homotopy height, grid-major height and graph-drawing height. In *International Symposium on Graph Drawing and Network Visualization*, pages 468–481. Springer, Cham, 2019
32. Erin Wolf Chambers, Arnaud de Mesmay, and Tim Ophelders. On the complexity of optimal homotopies. In *Proceedings of the 29th Annual ACM-SIAM Symposium on Discrete Algorithms*, pages 1121–1134. Society for Industrial and Applied Mathematics, 2018
33. Heather E Metcalf, Tanya L Crenshaw, Erin Wolf Chambers, and Cinda Heeren. Diversity across a decade: A case study on undergraduate computing culture at the university of illinois. In *Proceedings of the 49th ACM Technical Symposium on Computer Science Education*, pages 610–615, 2018
34. Erin W Chambers, Tao Ju, David Letscher, Mao Li, and Christopher Topp. Some heuristics for the homological simplification problem. In *Canadian Conference on Computational Geometry*, number August, 2018
35. Erin Wolf Chambers. Burning the medial axis. In *Canadian Conference on Computational Geometry*, page 77, 2017
36. Benjamin Burton, Erin Chambers, Marc Van Kreveld, Wouter Meulemans, Tim Ophelders, and Bettina Speckmann. Computing optimal homotopies over a spiked plane with polygonal boundary. In *25th Annual European Symposium on Algorithms (ESA 2017)*. Schloss Dagstuhl-Leibniz-Zentrum fuer Informatik, 2017
37. Erin Chambers, Irina Kostitsyna, Maarten Löffler, and Frank Staals. Homotopy measures for representative trajectories. In *24th Annual European Symposium on Algorithms (ESA 2016)*. Schloss Dagstuhl-Leibniz-Zentrum fuer Informatik, 2016
38. Victor Alvarez, Erin W Chambers, and László Kozma. Privacy by fake data: A geometric approach. In *Canadian Conference on Computational Geometry*, 2013

39. Erin W Chambers, Tao Ju, and David Letscher. Medial residues of piecewise linear manifolds. In *Canadian Conference on Computational Geometry*, 2013
40. Erin W Chambers, Kyle Sykes, and Cynthia Traub. Unfolding rectangle-faced orthostacks. In *Canadian Conference on Computational Geometry*, pages 23–28, 2012
41. Erin W Chambers, David Letscher, Tao Ju, and Lu Liu. Isotopic fréchet distance. In *Canadian Conference on Computational Geometry*, 2011
42. Erin W Chambers, Jeff Erickson, and Amir Nayyeri. Minimum cuts and shortest homologous cycles. In *Proceedings of the 25th Annual Symposium on Computational Geometry*, pages 377–385, 2009
43. Erin W Chambers and David Letscher. On the height of a homotopy. In *Canadian Conference on Computational Geometry*, volume 9, pages 103–106, 2009
44. Tanya L Crenshaw, Erin Wolf Chambers, and Heather Metcalf. A case study of retention practices at the university of illinois at urbana-champaign. In *Proceedings of the 39th SIGCSE Technical Symposium on Computer Science Education*, pages 412–416, 2008
45. Erin W Chambers, Jeff Erickson, and Pratik Worah. Testing contractibility in planar rips complexes. In *Proceedings of the 24th Annual Symposium on Computational Geometry*, pages 251–259, 2008
46. Sergio Cabello and Erin W Chambers. Multiple source shortest paths in a genus  $g$  graph. In *Proceedings of the 18th Annual ACM-SIAM Symposium on Discrete Algorithms*, pages 89–97. Society for Industrial and Applied Mathematics, 2007

## Book Chapters

41. Erin Chambers, Ellen Gasparovic, and Kathryn Leonard. Medial fragments for segmentation of articulating objects in images. In *Research in Shape Analysis*, pages 1–15. Springer, 2018
42. Erin Chambers, Tegan Emerson, Cindy Grimm, and Kathryn Leonard. Exploring 2d shape complexity. In *Research in Shape Analysis*, pages 61–83. Springer, 2018
43. Nina Amenta, Erin Wolf Chambers, Tegan Emerson, Rebecca Glover, Katharine Turner, and Shirley Yap. Density of local maxima of the distance function to a set of points in the plane. In *Research in Computational Topology*, pages 115–123. Springer, Cham, 2018
44. Erin Wolf Chambers and David Letscher. Persistent homology over directed acyclic graphs. In *Research in Computational Topology*, pages 11–32. Springer, Cham, 2018
45. Ivona Bezáková, Erin W Chambers, and Kyle Fox. Integrating and sampling cuts in bounded treewidth graphs. In *Advances in the Mathematical Sciences*, pages 401–415. Springer, Cham, 2016
46. Erin W. Chambers, Jeff Erickson, Kyle Fox, and Amir Nayyeri. Global minimum cuts in surface-embedded graphs. In Ming-Yang Kao, editor, *Encyclopedia of Algorithms*, pages 852–856. Springer New York, New York, NY, 2016

47. Gulce Bal, Julia Diebold, Erin Wolf Chambers, Ellen Gasparovic, Ruizhen Hu, Kathryn Leonard, Matineh Shaker, and Carola Wenk. Skeleton-based recognition of shapes in images via longest path matching. In *Research in Shape Modeling*, pages 81–99. Springer, Cham, 2015

### **Edited volumes**

48. Erin W. Chambers and Joachim Gudmundsson, editors. *39th International Symposium on Computational Geometry, SoCG 2023, June 12-15, 2023, Dallas, Texas, USA*, volume 258 of *LIPICs*. Schloss Dagstuhl - Leibniz-Zentrum für Informatik, 2023
49. Erin Chambers, Brittany Fasy, and Clément Maria, editors. *Algorithmic Aspects of Computational and Applied Topology*. Computational Geometry: Theory and Applications. Elsevier, 2022
50. Asli Genctav, Kathryn Leonard, Sibel Tari, Evelyne Hubert, Geraldine Morin, Noha El-Zehiry, and Erin Chambers, editors. *Research in Shape Analysis*. Association for Women in Mathematics Series. Springer, 2018
51. Erin Wolf Chambers, Brittany Terese Fasy, and Lori Ziegelmeier, editors. *Research in Computational Topology*. Association for Women in Mathematics Series. Springer, 2018
52. Gail Letzter, Kristin Lauter, Erin Chambers, Nancy Flournoy, Julia Elisenda Grigsby, Carla Martin, Kathleen Ryan, and Konstantina Trivisa, editors. *Advances in the Mathematical Sciences: Research from the 2015 Association for Women in Mathematics Symposium*. Association for Women in Mathematics Series. Springer, 2016

### **Technical Reports, Theses, Abstracts, Posters, Code, etc.**

51. Elena Wang, Elizabeth Munch, Erin Chambers, and Sarah Percival. A distance for geometric graphs via the labeled merge tree interleaving distance. CGWeek: Young Researchers Forum, 2023
52. Erin Chambers, Samira Jabry, and Elizabeth Munch. Un-smoothing of contour trees. CGWeek: Young Researchers Forum, 2023
53. Erin Chambers, Kathleen Kramer, and David Letscher. The edit distance for smoothings of reeb graphs. CGWeek: Young Researchers Forum, 2022
54. Erin Wolf Chambers, Tanya Crenshaw, Cinda Heeren, Heather Metcalf, and Aspen Russell. University of illinois department of computer science culture survey. Technical report, 2019
55. KA Buchin, Erin Wolf Chambers, TAE Ophelders, and B Speckmann. Fréchet isotopies to monotone curves. In *Abstr. 33rd European Workshop on Computational Geometry (EuroCG)*, pages 41–44, 2017
56. Erin W. Chambers and Matthew Meyer. Implementation of the edf with applications to shape recognition, 2015
57. Erin W. Chambers and Dylan Lawrence. Implementation of Fréchet algorithm, 2015



58. Yajie Yan, Tao Ju, David Letscher, and Erin Chambers. Burning the medial axis. In *ACM SIGGRAPH 2015 Posters*, pages 1–1. 2015
59. Erin W. Chambers, Christopher Conlon, Richard Pham, and Kyle Sykes. The polylink package
60. Erin Wolf Chambers. *Computing interesting topological features*. PhD thesis, University of Illinois at Urbana-Champaign, 2008
61. Tanya L Crenshaw, Erin Wolf Chambers, Heather Metcalf, and Umesh Thakkar. Recruitment, preparation, retention: A case study of computing culture at the university of illinois at urbana-champaign. Technical Report UIUCDCS-R-2007-2811, University of Illinois at Urbana-Champaign, 2007

### Submitted or In Preparation

59. Brian Bollen, Erin Chambers, Joshua A. Levine, and Elizabeth Munch. Reeb graph metrics from the ground up, 2021
60. Rehab Alharbi, Erin Wolf Chambers, and Elizabeth Munch. Realizable piecewise linear paths of persistence diagrams with reeb graphs, 2021
61. Erin W. Chambers, Tao Ju, David Letscher, Hannah Schreiber, and Dan Zeng. VHS: a package for homological simplification of voxelized plant root data for skeletonization. Under review, 2021

## Courses Taught

### At Saint Louis University

Numbers in the right margin are student evaluations of the instructor communication (left) and enthusiasm (right), with ratings from 1–4 (where 4 is the best possible score).

Spring 2022	CSCI 5150: Computational Geometry	2.92, 3.58
Spring 2021	CSCI 3200: Programming Languages	3.84, 4
Fall 2020	CSCI 3100/5100: Algorithms	4, 4
	CSCI 5090: Computer Science Colloquium	not evaluated
Spring 2020	CSCI 3200/5200: Programming Languages	not collected
	CSCI 5930: Advances Data Structures	not collected
Fall 2019	CSC 3100: Algorithms	3.67, 3.96
Spring 2019	CSCI 2100: Data Structures	3.84, 3.95
	CSCI 3200: Programming Languages	3.58, 3.95
Fall 2018	CSCI 2050/Phil 3410: Computer Ethics (co-instructor)	4, 4
	BCB 5300: Algorithms in Computational Biology	3, 3.5
Spring 2018	CSCI 2100: Data Structures	3.82, 3.82
	CSCI 3200: Programming Languages	3.77, 3.95
Fall 2017	CSCI 2050/Phil 3410: Computer Ethics (co-instructor)	3.77, 3.85
	CSCI 3100: Algorithms	3.82, 3.94
	Math Topology Seminar: Mini-Course on Computational Topology	not evaluated
Spring 2017	CSCI 3200: Programming Languages	3.84, 4
	CSCI4961/4962: Capstone	not evaluated
Fall 2016	CSCI 2050/PHIL 3410: Computer Ethics	3.42, 3.64
	CSCI 4650 Computer Security	3.53, 4

Numbers in the right margin are student evaluations of the instructor overall, with ratings from 1–5 (where 1 is the best possible score).

Spring 2016	CSCI 2100: Data Structures	1.21
	CSCI 3200: Programming Languages	1.55
Spring 2015	CSCI 281/Phil 341: Computer Ethics (co-instructor)	1.23
	CSCI 443: Computer Security	1.04
Spring 2014	CSCI 281/Phil 341: Computer Ethics (co-instructor)	1.65
	CSCI 344: Programming Languages	1.10
Fall 2013	CSCI 180: Data Structures	1.45
	CSCI 314: Algorithms	1.11
Spring 2013	CSCI 443: Computer Security	1.1
	CSCI 281/Phil 341: Computer Ethics (co-instructor)	1.5
Fall 2012	Math 135: Discrete Mathematics	1.36
	CSCI 180: Data Structures	1.09
Spring 2012	CSCI 150: Intro to Object Oriented Programming	1.5
	CSCI 344: Programming Languages	1.47
Fall 2011	CSCI 140: Introduction to Computer Science	1.6
	CSCI 180: Data Structures	1.11
Spring 2011	CSCI 180: Data Structures	1.26
	CSCI 493: Computer Security	1.33
Fall 2010	Math 135: Discrete Mathematics	1.36
	CSCI 180: Data Structures	1.7
Spring 2010	Math 135: Discrete Mathematics	1.85
	CSCI 314: Algorithms	1.25
Fall 2009	CSCI 145: Scientific Programming	1.57
	CSCI 180: Data Structures	1.22
Spring 2009	CSCI 150: Intro to Object Oriented Programming	1.28
	CSCI 314: Algorithms	1.18
Fall 2008	CSCI 140: Introduction to Computer Science	(not available)
	CSCI 150: Intro to Object Oriented Programming	(not available)

### At University of Illinois

Numbers in the right margin are student evaluations of the instructor's overall teaching effectiveness, with ratings from 1–5 (where 5 is the best possible score).

Spring 2008	CS 173: Discrete Mathematics	3.7
Summer 2004	CS 273: Introduction to Combinatorial Algorithms	(not available)
Summer 2003	CS 273: Introduction to Combinatorial Algorithms	4.6

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## Funding

- NSF Travel: Third Workshop for Women in Computational Topology (2317401). Sole Principle Investigator. 2023-2024 [\$14,400].
- NSF Collaborative Research: AF: Medium: A Unified Framework for Geometric and Topological Signature-Based Shape Comparison (2106672). Principle Investigator, linked with award

2107434 (PI Carola Wenk) and 2106578 (PI Elizabeth Munch). 2021-2025 [\$1.2 million combined total, \$363,596 total direct].

- NSF Collaborative Research: AF: Small: Reeb graph flows: Metrics, Drawings, and Analysis (1907612). Principle Investigator, linked with award 1907591 (PI Elizabeth Munch). 2019-2022 [\$400,000 combined total, \$152,623.00 total direct].
- Saint Louis University Research Institute Award. 2019-2021 [\$104,040].
- NSF Collaborative Research: ABI Innovation: Algorithms for recovering root architecture from 3D imaging (DBI-1759807). Co-principle Investigator, with David Letscher (PI), and linked with DBI-1356388 (PI Tao Ju) and DBI-1759796 (PI Chris Topp). 2018-2021 [\$702,000 combined total, \$270,048.00 total direct].
- NSF: Second Workshop for Women in Computational Topology (1841455). Co-Principal Investigator, with Ellen Gasparovic (PI). 2019 [\$15,000.00].
- NSF AF: Small: Extending algorithms for topological notions of similarity (CCF-1614562). Sole Principle Investigator. 2016-2019 [\$297,021].
- NSF DMS: Workshop for Women in Computational Topology (DMS-1619908). Co-principle Investigator, with Lori Ziegelmeier (PI) and Brittany Fasy (co-PI), 2016 [\$30,000].
- NSF DMS: Workshop for Women in Shape Analysis (DMS-1619759). Principle Investigator with co-PI Kathryn Leonard, 2016 [\$9,000].
- UIUC: 10 Years Later: Exploring the climate of the UIUC Computer Science Department in 2016, joint with Heather Metcalf, Tanya Crenshaw, and Cinda Hereen, awarded by the UIUC CS department. [\$60,000 total]
- Simons Visiting Professorship, funded by Simons Foundation through Oberwolfach [about \$2000 total]
- NSF HCC: CGV: Small: Collaborative Research: Theories, algorithms, and applications of medial forms for shape analysis. Principle investigator along with Tao Ju (PI) and David Letscher (co-PI). [\$242,020 combined total, \$127,123 total direct]
- NSF REU Supplemental Award (to grant CCR-1054779), Summer 2012 and Summer 2014 [\$12,000 each]
- NSF CAREER: Generalizing Planar Algorithm (CCR-1054779). Sole Principle Investigator. 2011-2016 [\$402,000]
- VOICES Faculty Fellowship to participate in Ethics Across the Curriculum Program, 2010 [\$2,500]
- SLU Summer Research Award, 2009 [\$5,000]
- NSF Graduate Research Fellowship 2002-2007
- SURGE (Support for Under-Represented Groups in Engineering) Fellowship, 2002-2007

## Mentorship and Advising

### Current PhD students

- Samira Jabry

### Former PhD and MS students

- Kathleen Kramer, PhD 2023. *The Local Smoothing of Reeb Graphs and the Edit Distance for Smoothed Reeb Graphs*
- Rehab Alharbi, PhD 2021. *Realizable Piecewise Linear Paths Of Persistence Diagrams With Reeb Graphs*
  - Assistant professor at Jazan University, Saudi Arabia
- Hiroki Yuda, MS 2019. *Topological Smoothing of Reeb Graphs*
  - Engineer at Bot Express
- Kyle Sykes, PhD 2016. *Burn Time: Computation and Properties*
  - Data scientist at Avise, Inc.
- RA supervisor for Katherine Paullin, PhD in Mathematics (primary advisor David Letscher)
  - Senior Lecturer at the University of Kentucky in the Department of Mathematics

### Former Postdocs

- Dr. Salman Parsa, 2019–2021
  - Assistant Professor at DePaul University
- Dr. Hannah Schreiber 2019-2021
  - Visiting Scientist at INRIA Sophia-Antipolis, in the Datashape Project

### Funded REU students

- Summer 2021: Emily Maxwell and Alexis Adewunmi
- Summer 2020: Levent Batakci, Abigail Branson, Bryan Castillo, and Candace Todd
- Summer 2018 – Spring 2019: Aspen Russell
- Summer 2015: Dylan Lawrence and Matthew Meyer
- Summer 2013: Christopher Conlon and Richard Pham
- Summer 2011: Di Fang and Philip Trettenero

## External Dissertation Committees

- Dissertation committee for Pepijn Roos Hoefgeest, PhD in Computer Science from Vrije Universiteit Amsterdam, 2023.
  - Dissertation committee for Tee Li, MS in Computer Science from Washington University, 2022.
  - Dissertation committee and reader for Tao Hou, PhD in Computer Science from Purdue University, 2022.
  - Habilitation (HDF) referee for Luca Castelli Aleardi, École Polytechnique, 2021.
  - Dissertation committee and coreferee for Patrick Schnider, PhD in Computer Science from ETH Zurich, Switzerland, 2020.
  - Dissertation committee for Chunyuan Li, MS in Computer Science from Washington University, 2019.
  - Dissertation reader for William Pettersson, PhD in Mathematics from the University of Queensland, Australia, 2014.
  - Dissertation committee for Liu Lu, Ph.D. in Computer Science from Washington University, 2011.
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## Service

### International or National Level Committees

- Trustee of the Society of Computational Geometry, 2019-present
- Member of the SafeTOC organizing committee and SafeTOC advocate for SoCG, FOCS, and CCCG conferences, 2019-present
- Chair of a Task Force to investigate double blind reviewing and PC submissions for the Symposium on Computational Geometry, 2020-2021
- Member of the Ad hoc committee to combat harassment and discrimination in the Theory of Computing community, 2018-2019
- Member of the Computational Geometry Steering Committee, 2016 to 2020, Secretary from 2018-2020
- Member of the Steering Committee for the Women in Computational Topology (WinComp-Top) network, 2016 to present
- Member of the Steering Committee for the Women in Shape Analysis (WiSH) network, 2015 to present
- Member of the AWM ADVANCE Research Collaboration Conferences for Women Committee, 2015 to present

## Program Committees and Workshops

- Co-organizer for the Third Women in Computational Topology workshop at the Bernoulli Center in Lausanne, Switzerland, 2023.
- PC Chair (joint with Joachim Gudmundsson) for Symposium on Computational Geometry, 2023.
- Co-organizer for the workshop “Beyond Abstract Measures: geometry and computation” at the Lorentz Center at Universiteit Leiden.
- Co-organizer for Dagstuhl Workshops 17072 (Applications of Topology to the Analysis of 1-Dimensional Objects) in 2017, and 19352 (Computation in Low-Dimensional Geometry and Topology) in 2019.
- Co-organizer for the Women in Computational Topology workshop at the IMA in August 2016.
- Co-organizer for the Second Women in Shape workshop at the Nesin Mathematics Village in Turkey, Summer 2015, and the Third Workshop hosted by Banff’s Casa Matemática Oaxaca in 2020 (held online); team leader for the Women in Shape (WiSH) Workshop at the Institute for Pure and Applied Mathematics (co-sponsored by the Association for Women in Mathematics), Summer 2013.
- Co-organizer for special sessions at the AWM Research Symposium in April 2015 and April 2019, and co-editor for the resulting special issue Springer journal.
- PC Chair for Young Researchers Forum at the Symposium on Computational Geometry, 2016.
- Co-organizer for AWM Poster Session and Speaker session at the 2014 Joint Math Meetings.
- PC Member for: Symposium on Discrete Algorithms, 2018; Symposium on Computational Geometry, 2010 and 2014; ATMCS, 2020; Canadian Conference on Computational Geometry, 2016, 2020; Young Researchers Forum at Symposium on Computational Geometry, 2013, 2014, 2020; European Workshop on Computational Geometry, 2013, 2018, 2021; Graph Drawing, 2009, 2014, and 2018; ISAAC 2017.

## University Committees

- Member of SLU’s School of Science and Engineering’s DEI committee, 2022-2024.
- Member of the Search Committee for SLU’s College of Arts and Science’s Dean, 2019-2020
- Member of the SLU Science and Engineering Task Force, 2017-2018
- Member of the SLU Arts and Science Faculty Council Executive Committee, 2014-2016
- Member of SLU Faculty Senate Committee on Shared Governance, 2013-2015
- Chair of a Faculty Search Committee, 2014-2015, 2015-2016, 2017-2018, 2018-2019, and 2021-2022.

- Member of the Search Committee for SLU Chief Information Officer, Spring 2013
- SLU College of Arts and Sciences Technology Committee, Chair for 2014-2016, Member for 2011-2013
- SLU College of Arts and Sciences Undergraduate Curriculum Committee, 2011-2012
- SLU Computer Science Committee, 2009-2016
- UIUC CS Department Graduate Admissions Committee member, 2004-2005
- UIUC JETT (Java Engagement for Teacher Training) conference planning committee member, 2004
- UIUC Undergraduate Education Study Committee, 2003-2004
- UIUC Computer Science Student Advisory Committee, 2002-2003
- UIUC Women in CS; President, 2001-2002; Grad VP, 2004-2008
- UIUC Campus Library Advisory Committee, 2001-2002
- Northern Virginia Co-op Education Association; Vice President, Summer 2001

### **Editing, Reviewing and Refereeing**

- Guest editor for Computational Geometry: Theory and Applications journal for the Special Issue on Algorithmic Aspects of Computational and Applied Topology, 2022
- Editor for Computing in Geometry and Topology, 2021–present
- Editor for Journal of Applied and Computational Topology, 2019–present
- Editor for Journal of Computational Geometry, 2017–2021
- Editor for: Advances in the Mathematics Sciences: Research from the 2015 AWM Symposium, published by Springer, 2016; Research in Shape Analysis, published by Springer (2016); Advances in Computational Topology, published by Springer (2018)
- Member of NSF review panel for CISE Algorithmic Foundations, 2012, 2015, 2020.
- Referee for ACM Transactions on Algorithms; Algorithmica; Computational Geometry: Theory and Applications; Computers and Graphics; Discrete and Computational Geometry; International Journal of Computational Geometry and Applications; Mathematical Reviews; Journal of Graphs Algorithms and Applications; SIAM Journal of Discrete Mathematics; SIAM Journal on Computing; Transactions on Sensor Networks
- External reviewer for conferences: ACM-SIAM Symposium on Discrete Algorithms (SODA); European Symposium on Algorithms (ESA); International Symposium on Algorithms and Computation; Latin American Theoretical Informatics Symposium (LATIN); Foundations of Computer Science (FOCS); Symposium on Computational Geometry (SOCG); Symposium on the Theory of Computing (STOC); Symposium on Theoretical Aspects of Computer Science (STACS); WADS



## Selected Talks

- 2023 Dagstuhl seminar on Topological Data Analysis and Applications;  
Tufts University CS Department colloquium;  
Institute for Mathematical and Statistical Learning, University of Chicago;  
Australian National University Topological Data Analysis Seminar;  
Notre Dame CSE Department colloquium
- 2022 Bridging applied and quantitative topology workshop;  
Association for Women in Mathematics Student Chapter, Saint Louis University;  
Workshop on Applications of Topological Data Analysis to Data Science, Artificial Intelligence, and Machine Learning, at SIAM Conference on Data Mining
- 2021 Tulane University: Joint Computer Science Colloquium and Mathematics Topology and Geometry seminar;  
University of Utah Data Seminar;  
Michigan State University CMSE Department Colloquium;  
Tel Aviv University Seminar on Computational Geometry and Robotics;  
Thematic Einstein Semester on Geometric and Topological Structure of Materials;  
Rose-Hulman Undergraduate Math Conference invited plenary speaker;  
Structures on Surfaces Seminar (hosted by INRIA, Université Paris-Est, and University of Luxembourg);  
Dartmouth Computer Science Colloquium;  
IST Austria Topology/Geometry Seminar
- 2020 New York University Geometry Seminar;  
Plenary speaker for 36th European Workshop on Computational Geometry
- 2019 Washington University Combinatorics seminar;  
Michigan State University Computational Mathematics, Science, and Engineering Colloquium;  
Speaker for Journées de géométrie algorithmique (French computational geometry week);  
Applied Algebraic Topology Research Network;  
Joint Mathematics Meetings
- 2018 Panel at Grace Hopper Celebration of Women in Computing;  
Instructor for the Intensive Research Program in Discrete, Combinatorial and Computational Geometry, at the Centre de Recerca Matemàtica in Barcelona;  
Speaker at the School on Low-Dimensional Geometry and Topology: Discrete and Algorithmic Aspects, at the Institut Henri Poincaré in Paris
- 2017 Dagstuhl Workshop on Applications of Topology to the Analysis of 1-Dimensional Objects;  
Washington University Theory Seminar;  
Computational and Algorithmic Topology in Sydney (CATS);  
Plenary speaker at the Canadian Conference on Computational Geometry;  
University of Manitoba CS Department Colloquium
- 2016 University of Toronto Math Seminar
- 2015 Oberwolfach workshop on Computational Geometric and Algebraic Topology, in Germany;  
Seminar at Eindhoven Technical University
- 2014 Computational Geometry Special Session at the Joint Math Meetings in Baltimore;  
ICERM Workshop on Network Science and Graph Algorithms
- 2013 Dagstuhl Workshop on Algorithms for Optimization Problems in Planar Graphs;  
Math/CS Department Colloquium at University of Missouri at St. Louis;  
University of Illinois at Urbana-Champaign Topology seminar;  
Oregon State University Department Seminar;  
Notre Dame CSE Seminar

- 2012 Computational Geometry Special Session at the Joint Math Meetings in Boston;  
Washington University (Math department);  
Ohio State University CS department seminar;  
Workshop on Computational Topology at SoCG 2012;  
Southern Illinois University at Edwardsville Math Department seminar
- 2011 Dagstuhl Workshop on Computational Geometry;  
Saarland University Informatics seminar
- 2010 University of California at Irvine CS theory seminar;  
Washington University Combinatorics seminar
- 2009 University of Illinois at Champaign-Urbana CS theory seminar;  
University of Victoria CS seminar
- 2008 McGill University CS Department seminar;  
Saint Louis University Math/CS Department seminar
- 2007 Knox College CS department seminar;  
Midwest Theory Day