Greg Bodwin

Associate Professor
Curriculum Vitae

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EDUCATION

Ph.D. in Computer Science
Massachusetts Institute of Technology (MIT), January 2017 – June 2018
Advised by Virginia Vassilevska Williams

Masters in Computer Science
Stanford University, September 2013 – December 2016
Advised by Virginia Vassilevska Williams

B.A. in Computer Science and Mathematics
Tufts University, September 2009 – April 2013
Summa Cum Laude distinction

RESEARCH JOBS

Associate Professor (with tenure)
University of Michigan EECS, 2026 – Present

Assistant Professor
University of Michigan EECS, August 2020 – 2026

Postdoctoral Fellow
Georgia Institute of Technology, August 2018 – August 2020
Hosted by Santosh Vempala

Research Assistant
ICSI at University of California Berkeley, Summer 2011
Hosted by Scott Shenker

PROFESSIONAL SERVICE

Workshop Organizer: STOC 2024 *"Applications of Turán-type problems in Theoretical Computer Science"*

Program Committee Member: ICALP (Track A) 2027, FOCS 2026, SODA 2026, FSTTCS 2025, SOSA 2025, ESA (Track S) 2024, ICALP 2023, SODA 2023, HALG 2021, STOC 2021, ESA (Track A) 2020

Journal Editor: ESA Special Issue 2021 Committee (JCSS), Chair of STOC Special Issue 2021 Committee (SICOMP; published August 2026)

MENTORSHIP

Ph.D. Students: Luba Samborska (2023-present), Gary Hoppenworth (2021-2026; placement: Research Assistant Professor, Toyota Technological Institute at Chicago), Lily Wang (2022-2025)

Visiting Ph.D. Student: Jonathan Conroy (Dartmouth College, Fall 2026)

Undergraduate Mentorship Resulting in a Publication: Aleksey Lopez (2026-present), Tuong Le (2024), Jeremy Flics (2024), Henry Fleischmann (2023), Forest Zhang (2023), Bandar Al-Dhalaan (2021), Shyamal Patel (2019)

Postdocs: Ohad Trabelsi (2021-2022)

DEPARTMENT SERVICE

Graduate Committee: Member, Fall 2020 – Present. Decides on winners of student awards and discusses changes to the graduate program that would benefit students.

Faculty Reappointment Committee: Internal Member, 2026–2027.

Transfer Credit Review: EECS 203 Arbiter, Winter 2025 – Present. Decides whether or not various courses from other universities will be accepted for transfer credit for EECS 203.

Foundational Course Initiative (FCI) for University of Michigan EECS 203: I met with a team for about an hour every two weeks, to discuss how best to improve student outcomes in EECS 203 and to work on creating new materials and content. Spring 2021 – Summer 2025.

University of Michigan Theory Seminar: Co-Organizer (with Euiwoong Lee), Fall 2020 – Summer 2025

Graduate Thesis Committees: Idan Shabat (Reader, Ben-Gurion University, 2026–present), Luba Samborska (Chair; Qualified Fall 2025), Chaitanya Subrahmanya (Defense TBD), Vikrant Ashvinkumar (External; Defense May 2026), Christine Konicki (Defense Fall 2024), Bradley Zykoski (Defense Winter 2023), Shang-En Huang (Defense Winter 2022)

Undergraduate Thesis Committees: Everett Xu (Second Reader, Winter 2027), Xizhe Li (Second Reader, 2025), Tuong Le (Advisor, 2025), Henry Fleischmann (Advisor, 2023), Forest Zhang (Advisor, 2023), Cheng-Hao Fu (Second Reader, 2022)

OUTREACH

MACSS Scholars, a scholarship for low-income students majoring in math, computer science, or data science at the University of Michigan. I served as a co-PI on the grant, a selection committee member in 2023, and a student mentor in 2023, 2024, and 2025.

Explore Graduate Studies, a day-long program for undergraduate students from nearby institutions interested in graduate study. I served as a student mentor and panelist in 2024 and 2021.

Explore Computer Science, a semester-long program for students from underrepresented backgrounds who are interested in computer science research. I mentored Andre Nandi an hour/week in Winter 2023.

AWARDS WITH FUNDING

E3 Strategic Technology Grant: Modularizing Foundational Engineering Courses with Classroom Proof, Co-PI (Awarded 2024)

Morris Wellman Faculty Development Professor, endowed professorship in U. Michigan EECS (Awarded 2023)

NSF Award AF: Small: Efficient Representation of Large Networks, 2153680 (Awarded 2022)

NSF Award, Co-PI, Fostering Interdisciplinary Community, Belonging, and Success of Low-Income, High-Achieving Mathematics, Computer Science, and Statistics Majors 2221516 (Awarded 2022)

CRLT Award, Co-PI, Supported Study Groups in Key Second Year STEM Courses (Awarded 2022)

AWARDS AND HONORS

Best Paper Awards: SOSA 2024, PODC 2021, STOC 2016 (student)

Georgia Tech Thank-A-Teacher Award (x3) (2019)

George M. Sprowls Award, best thesis of the year in MIT EECS (2018)

Outstanding Service to the Department Award, Stanford Computer Science Department (2016)

Assistant on NSF CCF-1528078 (2015–2018)

Travel Awards: Symposium on Discrete Algorithms (SODA) (2017 & 2018), Symposium on the Theory Of Computing (STOC) (2016)

James Schmolze Award for Excellence in Computer Science (2013)

Tufts University Benjamin G. Brown Scholarship (2013)

Tufts University Senior Thesis, High Honors (2013)

RESEARCH PUBLICATIONS

1. **Greedy Algorithms for Shortcut Sets and Hopsets** by Ben Bals, Joakim Blikstad, Greg Bodwin, Daniel Dadush, Sebastian Forster, and Yasamin Nazari, *arxiv preprint, 2025*
2. **Multiplicative Spanners in Minor-Free Graphs** by Greg Bodwin, Gary Hoppenworth, and Zihan Tan, *arxiv preprint, 2025*
3. **Improved Upper Bounds for the Directed Flow-Cut Gap** by Greg Bodwin and Luba Samborska, *accepted to FOCS 2026*
4. **Unconditional Lower Bounds for Degree Fault Tolerant Spanners** by Greg Bodwin and Aleksey Lopez, *published in ESA 2026, invited to the TCS special issue*
5. **Simple Length-Constrained Expander Decompositions** by Greg Bodwin, Bernhard Haeupler, D Ellis Hershkowitz, and Zihan Tan, *published in SOSA 2026*

6. **Light Edge Fault Tolerant Graph Spanners** by Greg Bodwin, Michael Dinitz, Ama Koranteng, and Lily Wang, *published in ICALP 2025*
7. **Improved Online Reachability Preservers** by Greg Bodwin and Tuong Le, *published in SODA 2025*
8. **A Lower Bound for Light Spanners in General Graphs** by Greg Bodwin and Jeremy Flics, *published in SODA 2025*
9. **Improved Shortest Path Restoration Lemmas for Multiple Edge Failures: Trade-offs Between Fault-tolerance and Subpaths** by Greg Bodwin and Lily Wang, *published in SODA 2025*
10. **Additive Spanner Lower Bounds with Optimal Inner Graph Structure** by Greg Bodwin, Gary Hoppenworth, Virginia Vassilevska Williams, Nicole Wein, and Zixuan Xu, *published in ICALP 2024*
11. **The Discrepancy of Shortest Paths** by Greg Bodwin, Chengyuan Deng, Jie Gao, Gary Hoppenworth, Jalaj Upadhyay, and Chen Wang, *published in ICALP 2024, full version accepted to SICOMP 2026*
12. **Spanning Adjacency Oracles in Sublinear Time** by Greg Bodwin and Henry Fleischmann, *published in ITCS 2024*
13. **Are there graphs whose shortest path structure requires large edge weights?** by Aaron Bernstein, Greg Bodwin, and Nicole Wein, *published in ITCS 2024*
14. **Fault-Tolerant Spanners against Bounded-Degree Edge Failures: Linearly More Faults, Almost For Free** by Greg Bodwin, Bernhard Haeupler, and Merav Parter, *published in SODA 2024*
15. **An Alternate Proof of Near-Optimal Light Spanners** by Greg Bodwin, *published in SOSA 2024 (Best Paper Award), featured in HALG 2025, full version in TheoretiCS 2025*
16. **Folklore Sampling is Optimal for Exact Hopsets: Confirming the $\sqrt{n}$ Barrier** by Greg Bodwin and Gary Hoppenworth, *published in FOCS 2023, featured in HALG 2024*
17. **Bridge Girth: A Unifying Notion in Network Design** by Greg Bodwin, Gary Hoppenworth, and Ohad Trabelsi, *published in FOCS 2023*
18. **Epic Fail: Emulators can tolerate polynomially many edge faults for free** by Greg Bodwin, Michael Dinitz, and Yasamin Nazari, *published in ITCS 2023*
19. **Opponent Indifference in Rating Systems: A Theoretical Case for Sonas** by Greg Bodwin and Forest Zhang, *published in ITCS 2023*
20. **New Additive Spanner Lower Bounds by an Unlayered Obstacle Product** by Greg Bodwin and Gary Hoppenworth, *published in FOCS 2022*
21. **Vertex Fault-Tolerant Emulators** by Greg Bodwin, Michael Dinitz, and Yasamin Nazari, *published in ITCS 2022*
22. **Partially Optimal Edge Fault-Tolerant Spanners** by Greg Bodwin, Michael Dinitz, and Caleb Robelle, *published in SODA 2022*
23. **A Note on Distance-Preserving Graph Sparsification** by Greg Bodwin, *published in IPL 2022*
24. **A Unified View of Graph Regularity via Matrix Decompositions** by Greg Bodwin and Santosh Vempala, *published in Random Structures and Algorithms (RSA) 2022*

25. **Restorable Shortest Path Tiebreaking for Edge-Faulty Graphs** by Greg Bodwin and Merav Parter, *published in PODC 2021 (Best Paper Award), featured in HALG 2022, full version in JACM 2023*
26. **On Additive Spanners in Weighted Graphs with Local Error** by Reyan Ahmed, Greg Bodwin, Keaton Hamm, Stephen Kobourov, and Richard Spence, *published in WG 2021*
27. **Multi-level Weighted Additive Spanners** by Reyan Ahmed, Greg Bodwin, Faryad Darabi Sahneh, Keaton Hamm, Stephen Kobourov, and Richard Spence, *published in SEA 2021*
28. **Optimal Vertex Fault-Tolerant Spanners in Polynomial Time** by Greg Bodwin, Michael Dinitz, and Caleb Robelle, *published in SODA 2021*
29. **New Fault Tolerant Subset Preservers** by Greg Bodwin, Keerti Choudhary, Merav Parter, and Noa Shahar, *published in ICALP 2020*
30. **Weighted Additive Spanners** by Reyan Ahmed, Greg Bodwin, Faryad Darabi Sahneh, Stephen Kobourov, and Richard Spence, *published in WG 2020*
31. **Strategy-Stealing is Non-Constructive** by Greg Bodwin and Ofer Grossman, *published in ITCS 2020*
32. **A Trivial Yet Optimal Solution to Vertex Fault Tolerant Spanners** by Greg Bodwin and Shyamal Patel, *published in PODC 2019*
33. **On the Structure of Unique Shortest Paths in Graphs** by Greg Bodwin, *published in SODA 2019, featured in HALG 2019*
34. **Reachability Preservers: New Extremal Bounds and Approximation Algorithms** by Amir Abboud and Greg Bodwin, *published in SODA 2018, full version in SICOMP 2024*
35. **Optimal Vertex Fault Tolerant Spanners (for Fixed Stretch)** by Greg Bodwin, Michael Dinitz, Merav Parter, and Virginia Vassilevska Williams, *published in SODA 2018*
36. **Preserving Distances in Very Faulty Graphs** by Greg Bodwin, Fabrizio Grandoni, Merav Parter, and Virginia Vassilevska Williams, *published in ICALP 2017*
37. **Testing Core Membership in Public Goods Economies** by Greg Bodwin, *published in ICALP 2017*
38. **New Results on Linear Size Distance Preservers** by Greg Bodwin, *published in SODA 2017, full version in SICOMP 2021*
39. **A Hierarchy of Lower Bounds for Sublinear Additive Spanners** by Amir Abboud, Greg Bodwin, and Seth Pettie, *published in SODA 2017, full version in SICOMP 2018*
40. **Fully Dynamic Spanners with Worst-Case Update Time** by Greg Bodwin and Sebastian Krinninger, *published in ESA 2016*
41. **The 4/3 Additive Spanner Exponent is Tight** by Amir Abboud and Greg Bodwin, *published in STOC 2016 (Best Student Paper Award), featured in HALG 2016, full version in J. ACM 2017*
42. **Graph Reconstruction with a Betweenness Oracle** by Mikkel Abrahamsen, Greg Bodwin, Eva Rotenberg, and Morten Stöckel, *published in STACS 2016*
43. **Error Amplification for Pairwise Spanner Lower Bounds** by Amir Abboud and Greg Bodwin, *published in SODA 2016*

44. **Better Distance Preservers and Additive Spanners** by Greg Bodwin and Virginia Vassilevska Williams, *published in SODA 2016, full version in TALG 2021*
45. **Very Sparse Additive Spanners and Emulators** by Greg Bodwin and Virginia Vassilevska Williams, *published in ITCS 2015*

THESIS, BOOKS, NOTES, SURVEYS

1. **Notes on the Linear-Algebraic View of Regularity Lemmas** by Greg Bodwin and Tuong Le, *notes derived from Tuong Le's undergraduate honors thesis, released on arxiv 2025*
2. **Graph Spanners: A Tutorial Review** by Reyan Ahmed, Greg Bodwin, Faryad Darabi Sahneh, Keaton Hamm, Mohammad Javad Latifi Jebelli, Stephen Kobourov, and Richard Spence, *survey, published in CSR 2020*
3. **Sketching Distances in Graphs** by Greg Bodwin, *PhD Thesis, published 2018 (winner of the George M. Sprowls Award for best thesis of the year in MIT EECS)*

INVITED TALKS

Keynote Talks at Conferences:
SWAT (2024)

Invited Talks at Conferences:
Highlights of Algorithms (HALG) (2025, 2022, 2019, 2016),
TRIPODS Southwest Summer Conference (2019)

Invited Talks At Workshops:
DIMACS at Rutgers, *"Fine-Grained Complexity of Graph Problems"* (2026),
University of Sydney, *"Workshop on Trends in Approximation and Online algorithms (TAO)"* (2025),
IISc Bengaluru, *"Frontiers of Graph Algorithms"* (2025),
Joint Mathematics Meetings *"AMS Special Session on Applications of Extremal Graph Theory to Network Design"* (2024),
Dagstuhl *"Graph Algorithms: Cuts, Flows, and Network Design"* (2023),
Rutgers *"Modern Techniques in Graph Algorithms"* (2023),
FOCS *"Advances on Metric Embeddings"* (2022),
Northwestern University *"Junior Theorists Workshop"* (2019),
CANADAM *"Discrete Algorithms"* (2019),
SODM *"Theoretical Computer Science as a New Discovery Engine of Discrete Math"* (2018),
Simons Institute *"Fine-Grained Complexity and Algorithm Design Workshop Reunion"* (2016),
University of Hong Kong *"China Theory Week"* (2016),
STOC-SOCG *"Spanners: Graphs and Geometry"* (2016)

Invited Talks At Seminars:
Wayne St. (2025), U. Waterloo (2024), U. Michigan CSE (2024, 2023, 2020), U. Michigan College of Engineering (2023), UT Austin (2023), Rutgers (2023, 2017), Weizmann Institute (2023), University of Salzburg (2022), Rice University (2020), Boston University (2020), U Illinois Chicago (2020), U Mass. Amherst (2020), UC Santa Barbara (2020), University of Arizona (2019), Georgia Tech (2019), Emory (2019), Harvard (2018), Boston University (2017), Princeton (2017, 2015), MIT (2017–2018),

Penn State (2016), Columbia University (2015), UC Berkeley (2015), Stanford University (2014 – 2017, 2019)

TEACHING

University of Michigan EECS 598 "Theory of Network Design" (Fall 2023, Winter 2021)

University of Michigan EECS 203 "Advanced Topics" (Winter 2027, scheduled; Fall 2026). Developed the Advanced Topics section.

University of Michigan EECS 203 "Discrete Math" (Fall 2025 ×2, Fall 2024 ×2, Fall 2023, Fall 2022 ×2, Winter 2022, Fall 2020)

University of Michigan EECS 477 "Introduction to Algorithms" (Fall 2021)

Georgia Tech CS 2051 "Honors Discrete Math for CS" (Spring 2019) *Winner: Thank-A-Teacher Award (x3)*

SPLASH program: "Games of Math" (intro to game theory for high school students), "That's So Random" (intro to probability for high school students) (Fall 2017)

Teaching Assistant: Stanford University CS267 "Graph Algorithms" (Winter 2015), Stanford University CS221 "Artificial Intelligence: Principles and Techniques" (Fall 2014), Tufts University COMP40 "Machine Structure and Assembly Language Programming" (Fall 2011 and Fall 2012), Tufts University COMP15 "Data Structures" (Spring 2011)