

Lucia (Lucy) Williams

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EDUCATION

- Ph.D. Computer Science, Montana State University, 2022
- B.S. Applied Computational and Mathematical Sciences, University of Washington, 2014
- B.A. Community, Environment, and Planning, University of Washington, 2014

APPOINTMENTS

- 2024– University of Montana
Assistant Professor, Department of Computer Science
- 2022–23 Montana State University
Assistant Research & Teaching Professor, School of Computing

RESEARCH AREAS

Bioinformatics: genome sequencing, RNA transcript assembly, viral population inference
Algorithms: approximation algorithms, graph algorithms
Computer science education: AI-integrated pedagogy, automated grading tools

PUBLICATIONS

Each paper is listed once, even if it has appeared in multiple versions. Note that some papers list authors in alphabetical order, following standard practice in theoretical computer science, while others list authors in order of contribution, with PI listed last, as in other areas of computer science

Journal Articles

- 2025 B. T. Fasy, S. Micka, D. Millman, A. Schenfisch, L. Williams, “A Faithful Discretization of Verbose Directional Transforms.” *Discrete & Computational Geometry*.
- 2025 F. H. C. Dias, L. Williams, B. Mumei, A. I. Tomescu. “Minimum Flow Decomposition in Graphs with Cycles using Integer Linear Programming.” *Journal of Global Optimization*.
- 2024 M. Cáceres, M. Cairo, A. Grigorjew, S. Khan, B. Mumei, R. Rizzi, Romeo, A. I. Tomescu, L. Williams. “Width Helps and Hinders Splitting Flows.” *ACM Transactions on Algorithms*.
- 2023 F. H. C. Dias, M. Cáceres, L. Williams, B. Mumei, A. I. Tomescu. “A Safety Framework for Flow Decomposition Problems via Integer Linear Programming.” *Bioinformatics*.
- 2022 S. Khan, M. Kortelainen, M. Cáceres, L. Williams, A. I. Tomescu. “Improving RNA Assembly via Safety and Completeness in Flow Decompositions.” *Journal of Computational Biology*.
- 2022 F. H. C. Dias, L. Williams, B. Mumei, A. I. Tomescu. “Efficient Minimum Flow Decomposition via Integer Linear Programming.” *Journal of Computational Biology*.

- 2022 L. Williams, A. I. Tomescu, B. Mumey. “Flow Decomposition with Subpath Constraints.” *IEEE/ACM Transactions on Computational Biology and Bioinformatics*.
- 2020 R. L. Belton, B. T. Fasy, R. Mertz, S. Micka, D. Millman, D. Salinas, A. Schenfisch, J. Schupbach, L. Williams, “Reconstructing Embedded Graphs from Persistence Diagrams.” *Computational Geometry*.
- 2020 L. Williams, B. Mumey. “Maximal Perfect Haplotype Blocks with Wildcards.” *iScience*.

Conference Proceedings

- 2020 L. Williams, B. Mumey. “Extending Maximal Perfect Haplotype Blocks to the Realm of Pangenomics.” *Algorithms for Computational Biology*. Missoula, MT
- 2019 L. Williams, G. Reynolds, B. Mumey. “RNA Transcript Assembly Using Inexact Flows.” *IEEE International Conference on Bioinformatics and Biomedicine*. San Diego, CA

TALKS

Invited Symposium Talks

- 2024 “Integrating AI to Bridge Biology and Computer Science Education.” A Symposium on AI in Research and Education. Hosted by Montana INBRE. Butte, Montana. October 14.

Invited Talks at Institutions

- 2024 “Decomposing Flow Networks for DNA Sequencing.” University of Montana Math Department Colloquium. Missoula, Montana. April 15.

Talks Given for Refereed Papers

- 2023 “A Safety Framework for Flow Decomposition Problems via Integer Linear Programming.” Recomb-Seq. Istanbul, Turkey.
- 2022 “Safety and Completeness in Flow Decompositions for RNA Assembly.” RECOMB. Ja Jolla, California.
- 2022 “Fast, Flexible, and Exact Minimum Flow Decompositions via ILP.” RECOMB. Ja Jolla, California.
- 2021 “Flow Decomposition with Subpath Constraints.” Workshop on Algorithms for Bioinformatics. Online due to pandemic.
- 2020 “Maximal Perfect Haplotype Blocks with Wildcards.” Recomb-Seq. Online due to pandemic.
- 2019 “RNA Transcript Assembly Using Inexact Flows..” IEEE International Conference on Bioinformatics and Biomedicine. San Diego, CA.

GRANTS AND AWARDS

Awards and Honors

- 2026 Computer Science Nominee, University of Montana College of Science Reynolds Award for Teaching Across the Curriculum
- 2025 University of Montana Nominee, Pew Scholars Award
- 2022 Montana State University Graduate Scholarship Excellence Award
- 2022 Finalist, Montana State University Three Minute Thesis Competition
- 2021 Montana State University Computer Science Department Outstanding PhD Researcher Award

Competitive Grants and Fellowships

- 2024–26 Closing The Gap Between Theory and Practice on Strain-level Viral Assembly. (\$237,754). Montana INBRE Major Faculty Research Grant. Project leader.
- 2025 Montana SMART FIRES Professional Development Grant. (\$2,500)
- 2024–25 Integrating AI to Bridge Biology and Computer Science Education. (\$10,000). University of Montana Flagship Fund. PI.
- 2023–26 Scaling Flow Decomposition to Multi-sample Multiassembly and Comparison (\$551,622). NSF DBI #2309902. Co-PI.
- 2023 Pursuing NIH Funding for GSoC: Improving RNA Assembly (\$25,000). Montana State University College of Engineering Thorson Excellence in Engineering Research Grant. PI.
- 2023 Improving CSCI 112 (Programming with C) with Autograded Assignments (\$10,000). Montana State University College of Engineering Bryan Innovative Instructional Grant. PI.
- 2020 Montana State University Graduate School Community Building Mini-grant
- 2020 Montana State University Graduate School Professional Advancement Grant
- 2019 Montana INBRE Competitive Student Travel Award
- 2017–18 Montana State University College of Engineering Benjamin Fellowship (\$20,000)

COURSES TAUGHT

University of Montana

Advanced Data Structures and Algorithms

Advanced Algorithms Topics

Computational Biology & Bioinformatics

Montana State University

Discrete Structures

Basic Data Structures & Algorithms

Programming with C

The Joy and Beauty of Data

SERVICE

Academic Journal Editorship

- 2025 *MDPI Mathematics Special Issue: Heuristic Algorithms in Computational Biology*, co-editor

Service to the University

- 2026– University of Montana CS Department Industry Advisory Board Meeting Co-organizer
- 2024– University of Montana CS Department Social Committee Chair
- 2024–25 University of Montana CS Department Scholarship Committee Member
- 2022 Montana State University Graduate Career Ladder Program Leader
- 2020 Montana State University CS Department graduate student orientation leader
- 2019–20 Montana State University CS Department prospective student visit day organizer

PhD Thesis Advisor

Jack Phillips, University of Montana, Computer Science

Masters Thesis Advisor

Afra Rahman, University of Montana, Computer Science

Doctoral Committees

Phil Douchinsky, University of Montana, Wildlife Biology

Ezra Mendales, University of Montana, Ecology and Evolution

Patrick Kreitzberg, University of Montana, Mathematics

Junwei Liao, University of Montana, Mathematics

Daniel Olson, University of Montana, Computer Science. Graduated 2025 with dissertation “Methods to Improve Efficiency, Sensitivity, and Selectivity of Sequence Similarity Search”

Van Magnan, University of Montana, Mathematics. Graduated 2024 with dissertation “Forbidden Substructure Problems in Graphs and Hypergraphs”

Adiesha Liyange, Montana State University, Computer Science. Graduated 2024 with dissertation “String Analysis and Algorithms with Genomic Applications”

Undergraduate Honors Thesis Committees

Jackie Olexa, University of Montana, Wildlife Biology & Computer Science

Directed Reading Program

Nathan Stouffer

Undergraduate Research Interns

2024– McKayl Bailey

2025– Grant Smith

2025 Madison Moffett

2025 Jose Rodriguez

2024–25 Tara Brown

2024–25 Jacob Olson

Club Ultimate Frisbee Coach

2018–23 Montana State University

2015–17 University of Washington

PEER REVIEW

Academic Conference Peer Review

Research in Computational Molecular Biology—Sequencing Workshop

Intelligent Systems for Molecular Biology

International Colloquium on Automata, Languages, and Programming

European Symposium on Algorithms

Academic Journal Peer Review

The Journal of Supercomputing (Springer)

Undergraduate Research Peer Review

University of Montana Conference on Undergraduate Research

MEMBERSHIPS

International Society of Computational Biology

Association of Computing Machinery

PROFESSIONAL DEVELOPMENT

2024 University of Montana Summer Teaching Institute (4 days)

2024 Computing Research Association Early Career Mentoring Workshop (1 day)

2023 Mindful Mentorship Program, Montana State University (1 semester)

2023 Kern Entrepreneurship Education Network Engineering Education Workshop (4 days)

PROFESSIONAL EMPLOYMENT

2014–17 Data Scientist, Marchex, Seattle, Washington

Updated April 2026