Frederick Stock

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Experience

University of Massachussets Lowell Fall 2023 – Spring 2024

Teaching Assistant

- Three sections
- Recitation, Office hours, Grading, Managing graders

Education

University of Massachussets Lowell 2022 – 2026

Ph.D. in Computer Science

Rochester Institute of Technology 2017 – 2021

Bachelor of Science in Applied Mathematics

Service

Technical and Adminstrative Support: Fall Workshop on Computational Geometry (FWCG) 2024
Reviewer: International Symposium on Distributed Computing (DISC) 2025
Reviewer: International Symposium on Computational Geometry (SoCG) 2025, 2024
Reviewer: Journal on Computational Geometry (JoCG) 2025 x2
Reviewer: The Fall Workshop on Computational Geometry (FWCG) 2024
Reviewer: The Canadian Conference on Computational Geoemtry (CCCG) 2024
Reviewer: International Symposium on Algorithms and Computation (ISAAC) 2024
Reviewer: Journal of Information Processing (JCDCGGG Special Issue) (JIP) 2024

Publications

Upcoming Publications

1. "Super Guarding and Dark Rays in Art Galleries" (MIT CompGeom Group, Hugo Akitaya, Erik Demaine, Adam Hesterberg, Anna Lubiw, Jayson Lynch, Joseph O'Rourke & Frederick Stock testi), *Discrete Mathematics & Theoretical Computer Science (DMTCS)*, TBA
2. "A Universal In-Place Reconfiguration Algorithm for Sliding Cube-Shaped Robots in a Quadratic Number of Moves" (Zachary Abel, Hugo Akitaya, Scott Duke Kominers, Matias Korman & Frederick Stock testi), *The Journal of Computational Geometry (JoCG)*, TBA
3. "Agent Motion Planning as Block Asynchronous Cellular Automata: Pushing, Pulling, Suplexing, and More" (MIT Hardness Group, Hayashi Ani, Josh Brunner, Erik Demaine, Jenny Diomidova, Timothy Gomez, Della Hendrickson, Yael Kirkpatrick, Jeffery Li, Jayson Lynch, Ritam Nag & Frederick Stock testi), *Natural Computing (NACO)*, TBA
4. "Connectivity Augmentation for Planar Graphs and Beyond-Planar Graphs" (Hugo Akitaya, Justin Dallant, Erik Demaine, Michael Kaufmann, Linda Kleist, Frederick Stock, Csaba D. Tóth & Torsten Ueckerdt testi), *The 33rd International Symposium on Graph Drawing and Network Visualization (GD)*, 2025
5. "Sliding Squares in Parallel" (Hugo Akitaya, Sándor Fekete, Peter Kramer, Saba Molaei, Christian Rieck, Frederick Stock & Tobias Wallner testi), *The European Symposium on Algorithms (ESA)*, 2025

Journal Papers

6. "Minimum Plane Bichromatic Spanning Trees" (Hugo Akitaya, Ahmad Biniaz, Erik Demaine, Linda Kleist, Frederick Stock & Csaba D. Tóth testi), *ACM Transactions on Algorithms (Transactions on Algorithms)*, 2024
7. "Physical Visitor Access Control and Authentication Using Blockchain, Smart Contracts and Internet of Things" (Frederick Stock, Yesem Kurt Peker, Alfredo J. Perez & Jarel Hearst testi), *Cryptography (MDPI), Special Issue on Emerging Topics in Blockchain Security and Privacy (Cryptography)*, 2022

Conference Proceedings

8. "Input-Sensitive Reconfiguration of Sliding Cubes" (Hugo Akitaya, Matias Korman & Frederick Stock testi), *The Canadian Conference on Computational Geometry (CCCG)*, 2025
9. "Quasigeodesics on the Cube" (MIT CompGeom Group, Hugo Akitaya, Erik Demaine, Adam Hesterberg, Thomas C. Hull, Anna Lubiw, Jayson Lynch, Klara Mundilova, Chie Nara, Joseph O'Rourke, Frederick Stock, Josef Tkadlec & Ryuhei Uehara testi), *The Canadian Conference on Computational Geometry (CCCG)*, 2025
10. "On Inside-out Dissections of Polygons and Polyhedra" (Reymond Akpanya, Adi Rivkin & Frederick Stock testi), *The Canadian Conference on Computational Geometry (CCCG)*, 2025
11. "Brief Announcement: Broadcast via Mobile Agents in a Dynamic Network: Interplay of Graph Properties & Agents" (William K. Moses Jr., Amanda Redlich & Frederick Stock testi), *4th Symposium on Algorithmic Foundations of Dynamic Networks (SAND)*, 2025
12. "Finding Shortest Reconfiguration Sequences for Modular Robots" (UML Modular Robotics Group, Hugo Akitaya, Andrew Clements, Sam Downey, Jonathan Eisenbies, Soham Samanta, Gabriel Shahrouzi & Frederick Stock testi), *41st International Symposium on Computational Geometry Media Exposition (SoCG:ME 2025)*, 2025
13. "Navigation in dynamic graphs: How to defeat the Acme Graph Exploder" (Amanda Epping Redlich, William K Moses Jr. & Frederick Stock testi), *2025 Spring Eastern Sectional Meeting of the American Mathematical Society (AMS Spring 2025)*, 2025
14. "Minimum Plane Bichromatic Spanning Trees" (Hugo Akitaya, Ahmad Biniaz, Erik Demaine, Linda Kleist, Frederick Stock & Csaba D. Tóth testi), *35th International Symposium on Algorithms and Computation (ISAAC)*, 2024
15. "Easier Ways to Prove Counting Hard: A Dichotomy for Generalized #SAT, Applied to Constraint Graphs" (MIT Hardness Group, Josh Brunner, Erik Demaine, Jenny Diomidova, Timothy Gomez, Markus Hecher, Frederick Stock & Zixiang Zhou testi), *35th International Symposium on Algorithms and Computation (ISAAC)*, 2024
16. "Agent Motion Planning as Block Asynchronous Cellular Automata: Pushing, Pulling, Suplexing, and More" (MIT Hardness Group, Hayashi Ani, Josh Brunner, Erik Demaine, Jenny Diomidova, Timothy Gomez, Della Hendrickson, Yael Kirkpatrick, Jeffery Li, Jayson Lynch, Ritam Nag & Frederick Stock testi), *21st International Conference on Unconventional Computation and Natural Computation (UCNC)*, 2024
17. "A Universal In-Place Reconfiguration Algorithm for Sliding Cube-Shaped Robots in a Quadratic Number of Moves" (Zachary Abel, Hugo Akitaya, Scott Duke Kominers, Matias Korman & Frederick Stock testi), *40th International Symposium on Computational Geometry (SoCG)*, 2024
18. "Deltahedral Domes over Equiangular Polygons" (MIT CompGeom Group, Hugo Akitaya, Erik Demaine, Adam Hesterberg, Anna Lubiw, Jayson Lynch, Joseph O'Rourke, Frederick Stock & Josef Tkadlec testi), *40th International Symposium on Computational Geometry (EuroCG)*, 2024
19. "Super Guarding and Dark Rays in Art Galleries" (MIT CompGeom Group, Hugo Akitaya, Erik Demaine, Adam Hesterberg, Anna Lubiw, Jayson Lynch, Joseph O'Rourke & Frederick Stock testi), *The Canadian Conference on Computational Geometry (CCCG)*, 2023
20. "Blockchain Ensured Physical Visitor Access Control and Authentication" (Frederick Stock, Jarel Hearst & Yessem Kurt Peker testi), *IEEE International Conference on Mobile Ad Hoc and Smart Systems, REUNS (IEEE MASS REUNS)*, 2022

Other Publications

21. "Open Problems from CCCG 2025" (Hugo Akitaya & Frederick Stock testi), *The Canadian Conference on Computational Geoemtry (CCCG)*, 2025
22. "Hardness Table Layout Hardness Table" (MIT Hardness Group, Josh Brunner, Erik Demaine, Jenny Diomidova, Della Hendrickson, Timothy Gomez, Hayashi Layers, Frederick Stock & Andy Tockman testi), *SIGTBD*, 2025
23. "Open Problems from CCCG 2024" (Reymond Akpanya, Bastien Rivier & Frederick Stock testi), *The Canadian Conference on Computational Geoemtry (CCCG)*, 2024
24. "Reconfiguration of 3D Pivoting Modular Robots" (Hugo Akitaya & Frederick Stock testi), *The International Symposium on Computational Geometry: Young Researchers Forum (SoCG:YRF)*, 2023

Presentations

1. "Input-Sensitive Reconfiguration of Sliding Cubes" *The Canadian Conference on Computational Geometry*, 2025
2. "On Inside-out Dissections of Polygons and Polyhedra" *The Canadian Conference on Computational Geometry*, 2025
3. "Finding Shortest Reconfiguration Sequences for Modular Robots" *41st International Symposium on Computational Geometry Media Exposition*, 2025
4. "Minimum Plane Bichromatic Spanning Trees" *35th International Symposium on Algorithms and Computation*, 2024
5. "Easier Ways to Prove Counting Hard: A Dichotomy for Generalized #SAT, Applied to Constraint Graphs" *35th International Symposium on Algorithms and Computation*, 2024
6. "A Universal In-Place Reconfiguration Algorithm for Sliding Cube-Shaped Robots in a Quadratic Number of Moves" *40th International Symposium on Computational Geometry*, 2024
7. "Super Guarding and Dark Rays in Art Galleries" *The Canadian Conference on Computational Geometry*, 2023
8. "Reconfiguration of 3D Pivoting Modular Robots" *SoCG Young Researchers Forum*, 2023
9. "Blockchain Ensured Physical Visitor Access Control and Authentication (poster)" *IEEE International Conference on Mobile Ad Hoc and Smart Systems, REUNS*, 2022

Accolades

UMass Lowell Student Research Symposium - Winner Kennedy College of Sciences (Graduate) 2023
Magna Cum Laude - Rochester Institute of Technology 2021