Austin Luchsinger

The University of Texas Rio Grande Valley
Department of Computer Science

Assistant Professor
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Education

The University of Texas at Austin — August 2020 - 2024
PhD *in Electrical and Computer Engineering*
Advisor: David Soloveichik

The University of Texas Rio Grande Valley — August 2018 - May 2020
MS *in Computer Science*
Advisor: Robert Schweller

The University of Texas Rio Grande Valley — August 2014 - May 2018
BS *in Computer Science*
Conferred with honors: *magna cum laude*
Advisors: Robert Schweller and Tim Wylie

Research Experience

Assistant Professor — September 2024 - Present
Department of Computer Science
The University of Texas Rio Grande Valley

Graduate Research Assistant — August 2020 - 2024
Chandra Department of Electrical and Computer Engineering
The University of Texas at Austin

Graduate Research Assistant — June 2018 - May 2020
Department of Computer Science
The University of Texas Rio Grande Valley

Undergraduate Research Assistant — January 2016 - May 2018
Department of Computer Science
The University of Texas Rio Grande Valley

Military Service

Avionics Technician (Sergeant) — January 2009 - January 2014
United States Marine Corps

Academic Honors and Awards

Cockrell School of Engineering Thrust 2000 Multi-Year Fellowship — 2021-2024
The University of Texas at Austin

The Dr. Brooks Carlton Fowler Endowed Presidential Graduate Fellowship in Electrical and Computer Engineering — 2020
The University of Texas at Austin

The UTRGV National Engineers Week Outstanding Graduate Student — 2019
The University of Texas Rio Grande Valley

The UTRGV Presidential Graduate Research Assistantship — 2018-2020
The University of Texas Rio Grande Valley

The UTRGV National Engineers Week Outstanding Undergraduate Student 2017
The University of Texas Rio Grande Valley

The UTRGV Engaged Scholar Award for Undergraduate Research 2016-2017
The University of Texas Rio Grande Valley

Citation Information

Total Citations: 246, h-index: 9
Citation information pulled from Google Scholar on Apr. 13, 2026.

Refereed Journal Publications

[α] = alphabetical order following theoretical computer science convention.
* = co-corresponding authors.

27. [α] Caballero, D., Cantu, A., Gomez, T., **Luchsinger, A.**, Schweller, R., Wylie, T., *Uniform Robot Relocation is Hard in Only Two Directions Even Without Obstacles*, Natural Computing 24 (1), 3-16, 10.1007/s11047-024-10007-4, 2025.
26. Vasić, M.*, Chalk, C.*, **Luchsinger, A.**, Khurshid, S., Soloveichik, D., *Programming and Training Rate-Independent Chemical Reaction Networks*, Proceedings of the National Academy of Sciences 119 (24), e2111552119 10.1073/pnas.2111552119, 2022.
25. [α] Caballero, D., Cantu, A., Gomez, T., **Luchsinger, A.**, Schweller, R., Wylie, T., *Fast Reconfiguration of Robot Swarms with Uniform Control Signals*, Natural Computing 20 (4), 659-669 10.1007/s11047-021-09864-0, 2021.
24. [α] Cantu, A., **Luchsinger, A.**, Schweller, R., Wylie, T., *Covert Computation in Self-Assembled Circuits*, Algorithmica 83, pages 531-552 10.1007/s00453-020-00764-w, 2021.
23. [α] Caballero, D., Cantu, A., Gomez, T., **Luchsinger, A.**, Schweller, R., Wylie, T., *Hardness of Reconfiguring Robot Swarms with Uniform External Control in Limited Direction*, Journal of Information Processing 10.2197/ipsjjip.28.782, 2020.
22. [α] **Luchsinger, A.**, Schweller, R., Wylie, T., *Self-Assembly of Shapes at Constant Scale Using Repulsive forces*, Natural Computing 18, 93-105 10.1007/s11047-018-9707-9, 2019.

Refereed Conference Proceedings

21. [α] Bajaj, D., Fu, B., Knobel, R., **Luchsinger, A.**, Massie, A., Santos, P., Santos, R., Schweller, R., Tomai, E., Wylie, T., *Reachability with Restricted Reactions in Inhibitory Chemical Reaction Networks*, To appear in proceedings of the 20th Scandinavian Symposium on Algorithm Theory (SWAT'26), 2026.
20. [α] Avila-Jimenez, A., Barreda, D., Evans, S.L., **Luchsinger, A.**, Massie, A., Schweller, R., Tomai, E., Wylie, T., *General Computation Using Slidable Tiles with Deterministic Global Forces*, Proceedings of the 17th Innovations in Theoretical Computer Science (ITCS), 2026.
19. [α] Bajaj, D., Castellanos, J., Knobel, R., **Luchsinger, A.**, Massie, A., Salinas, A., Santos, P., Santos, R., Schweller, R., Wylie, T., *Polynomial Equivalence of Extended Chemical Reaction Models*, Proceedings of the International Symposium on Algorithms and Computation (ISAAC), 2025.
18. [α] **Luchsinger, A.**, Massie, A., Schweller, R., Tomai, E., Wylie, T., *Polynomial Simulations of CRN Models with Trimolecular Void Step-Cycle CRNs*, Proceedings of the 22nd International Conference on Unconventional Computing and Natural Computing (UCNC), 2025.
17. [α] Fu, B., Gomez, T., Knobel, R., **Luchsinger, A.**, Massie, A., Rodriguez, M., Salinas, A., Schweller, R., Wylie, T., *Reachability in Deletion-only Chemical Reaction Networks*, Proceedings of the 31st International Conference on DNA Computing and Molecular Programming (DNA31), 2025.

16. **Luchsinger, A.**, Doty, D., Soloveichik, D., *Brief Announcement: Optimally Encoding Information in Chemical Reaction Networks*, Proceedings of the 43rd Symposium on Principles of Distributed Computing (PODC), 2024.
15. **Luchsinger, A.**, Doty, D., Soloveichik, D., *Optimal Information Encoding in Chemical Reaction Networks*, Proceedings of the 29th International Conference on DNA Computing and Molecular Programming (DNA29), 2023.
14. [α] Caballero, D., Cantu, A., Gomez, T., **Luchsinger, A.**, Schweller, R., Wylie, T., *Uniform Robot Relocation is Hard in Only Two Directions Even Without Obstacles*, Proceedings of the 20th International Conference on Unconventional Computation and Natural Computation (UCNC 2023), 2023.
13. **Luchsinger, A.**, *Brief Announcement: Barrier-1 Reachability for Thermodynamic Binding Networks is PSPACE-complete*, Proceedings of the 1st Symposium on Algorithmic Foundations of Dynamic Networks (SAND 2022), 2022.
12. Breik, K., **Luchsinger, A.**, Soloveichik, D., *Molecular Machines from Topological Linkages*, Proceedings of the 27th International Conference on DNA Computing and Molecular Programming (DNA27), 2021.
11. [α] Caballero, D., Cantu, A., Gomez, T., **Luchsinger, A.**, Schweller, R., Wylie, T., *Unit Tilt Row Relocation in a Square*, Proceedings of the 23rd Thailand-Japan Conference on Discrete and Computational Geometry, Graphs, and Games (JCDCG^3 '21), 2021.
10. [α] Cantu, A., **Luchsinger, A.**, Schweller, R., Wylie, T., *Signal Passing Self-Assembly Simulates Tile Automata*, Proceedings of the 31st International Symposium on Algorithms and Computation ISAAC 2020, 2020.
9. [α] Caballero, D., Cantu, A., Gomez, T., **Luchsinger, A.**, Schweller, R., Wylie, T., *Relocating Units in Robot Swarms with Uniform Control Signals is PSPACE-complete*, Proceedings of the 32nd Canadian Conference on Computational Geometry (CCCG 2020), 2020.
8. [α] Caballero, D., Cantu, A., Gomez, T., **Luchsinger, A.**, Schweller, R., Wylie, T., *Building Patterned Shapes in Robot Swarms with Uniform Control Signals*, Proceedings of the 32nd Canadian Conference on Computational Geometry (CCCG 2020), 2020.
7. [α] Balanza-Martinez, J., Caballero, D., Cantu, A., Flores, M., Gomez, T., **Luchsinger, A.**, Reyes, R., Schweller, R., Wylie, T., *Hierarchical Shape Construction and Complexity for Slidable Polyominos under Uniform External Forces*, Proceedings of the ACM-SIAM Symposium on Discrete Algorithms (SODA'20), 2020.
6. [α] Balanza-Martinez, J., Caballero, D., Cantu, A., Gomez, T., **Luchsinger, A.**, Schweller, R., Wylie, T., *Relocation with Uniform External Control in Limited Directions (Short Abstract)*, The 22nd Japan Conference on Discrete and Computational Geometry, Graphs, and Games (JCDCG^3 '19), 2019.
5. [α] Cantu, A., **Luchsinger, A.**, Schweller, R., Wylie, T., *Covert Computation in Self-Assembled Circuits*, Proceedings of the 46th International Colloquium on Automata, Languages, and Programming (ICALP'19), 2019.
4. [α] Balanza-Martinez, J., Caballero, D., Cantu, A., Garcia, L., **Luchsinger, A.**, Reyes, R., Schweller, R., Wylie, T., *Full Tilt: Universal Constructors for General Shapes with Uniform External Forces*, Proceedings of the 30th ACM-SIAM Symposium on Discrete Algorithms (SODA'19), 2019.
3. [α] Chalk, C., **Luchsinger, A.**, Martinez, E., Schweller, R., Winslow, A., Wylie, T., *Freezing Simulates Non-freezing Tile Automata*, Proceedings of the 24th International Conference on DNA Computing and Molecular Programming (DNA 24), 2018.

2. [α] Cantu, A., Gonzalez, A., Lozano, C., **Luchsinger, A.**, Medina, E., Martinez, F., Ramirez, A., Wylie, T., *Tile Pattern-Building Games on a Grid are PSPACE-complete (Short Abstract)*, Proceedings of the 21st Japan Conference on Discrete and Computational Geometry, Graphs, and Games (JCDCG^3 '18), 2018.
1. [α] Chalk, C., **Luchsinger, A.**, Schweller, R., Wylie, T., *Self-Assembly of Any Shape with Constant Tile Types using High Temperature*, Proceedings of the 26th Annual European Symposium on Algorithms (ESA 2018), 2018.
0. [α] **Luchsinger, A.**, Schweller, R., Wylie, T., *Self-Assembly of Shapes at Constant Scale Using Repulsive forces*, Proceedings of the 16th International Conference on Unconventional Computation and Natural Computation (UCNC 2017), 2017.

Unrefereed Publications

1. [α] Doty, D., Kornerup, N., **Luchsinger, A.**, Orshansky, L., Soloveichik, D., Woods, D., *Harvesting Brownian Motion: Zero Energy Computational Sampling*, arXiv preprint [arXiv:2309.06957] 2023.

Conference Talks

12. **Polynomial Simulations of CRN Models with Trimolecular Void Step-Cycle CRNs** at *the 22nd International Conference on Unconventional Computing and Natural Computing*
11. **Reachability in Deletion-only Chemical Reaction Networks** at *the 31st International Conference on DNA Computing and Molecular Programming*
10. **Brief Announcement: Optimally Encoding Information in Chemical Reaction Networks** at *the 43rd ACM Symposium on Principles of Distributed Computing*
9. **Optimal Information Encoding in Chemical Reaction Networks** at *the 29th International Conference on DNA Computing and Molecular Programming*
8. **Barrier-1 Reachability for Thermodynamic Binding Networks is PSPACE-Complete** at *the 1st Symposium on Algorithmic Foundations of Dynamic Networks*
7. **Molecular Machines from Topological Linkages** at *the 27th International Conference on DNA Computing and Molecular Programming*
6. **Signal Passing Self-Assembly Simulates Tile Automata** at *the 31st International Symposium on Algorithms and Computation*
5. **Covert Computation in Self-Assembled Circuits** at *Proceedings of the 46th International Colloquium on Automata, Languages, and Programming*
4. **Full Tilt: Universal Constructors for General Shapes with Uniform External Forces** at *the 30th ACM-SIAM Symposium on Discrete Algorithms*
3. **Tile Pattern-Building Games on a Grid are PSPACE-complete** at *the 21st Japan Conference on Discrete and Computational Geometry, Graphs, and Games*
2. **Self-Assembly of Any Shape with Constant Tile Types using High Temperature** at *the 26th Annual European Symposium on Algorithms*
1. **Self-Assembly of Shapes at Constant Scale Using Repulsive Forces** at *the 16th International Conference on Unconventional Computation and Natural Computation*

Review Service

Journal Referee

Nature (2026)
Algorithmica (2021, 2022, 2023, 2025)

Conference Referee

The 29th International Conference on DNA Computing and Molecular Programming (DNA29)
The 16th International Conference on Algorithms and Computation (WALCOM 2022)

Program Committee

The 32nd International Conference on DNA Computing and Molecular Programming (DNA32)

University/ College/ Department Service

Faculty Impact Awards Committee Member April 2026
College of Engineering and Computer Science
The University of Texas Rio Grande Valley

College Council Member September 2024 - Present
College of Engineering and Computer Science
The University of Texas Rio Grande Valley

Advising/ Mentorship

Masters Advisor

2026: Ramiro Santos

Masters Committee

2025: Ryan Knobel

Teaching Experience

Instructor - Molecular Computing (CSCI 8322) Spring 2025
The University of Texas Rio Grande Valley

Instructor - Unconventional Computing (CSCI 6370) Spring 2026
The University of Texas Rio Grande Valley Spring 2025

Instructor - Automata, Formal Languages, and Computation (CSCI 4325) Spring 2026
The University of Texas Rio Grande Valley Fall 2025
Spring 2025
Fall 2024

Teaching Assistant - Unconventional Computation (ECE381V) Spring 2023
The University of Texas at Austin

Teaching Assistant - Algorithms (ECE360C) Fall 2022
The University of Texas at Austin

Teaching Assistant - Introduction to Computer Science (CSCI 1101) Spring 2020
The University of Texas Rio Grande Valley Fall 2019