Ronen Wdowinski

Combinatorics Group – Institute of Discrete Mathematics
Graz University of Technology (TU Graz)
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Current Position

Postdoctoral Researcher Sep. 2024 – present
Supervisor: Mihyun Kang
Graz University of Technology, Graz, Austria

Education

PhD in Combinatorics and Optimization May 2021–Aug. 2024
Supervisor: Penny Haxell
Thesis title: Arboricity and transversal problems on bounded degree graphs
University of Waterloo, Waterloo ON, Canada

Master of Mathematics (Combinatorics and Optimization) Sep. 2019–Apr. 2021
Supervisor: Penny Haxell
University of Waterloo, Waterloo ON, Canada

Bachelor of Science (Major: Mathematics) Aug. 2015–Jun. 2019
Rice University, Houston TX, USA

Previous Employment

Instructor Jan.–Apr. 2024
University of Waterloo, Faculty of Mathematics
MATH 136: Linear Algebra 1 for Honours

Teaching Assistant Sep. 2019–Dec. 2023
University of Waterloo, Faculty of Mathematics

- MATH 239: Introduction to Combinatorics — three terms, 2019–2020
- MATH 249: Introduction to Combinatorics (Advanced) — two terms, 2021–2023
- CO 250: Introduction to Optimization — two terms, 2020–2021
- CO 331: Coding Theory — two terms, 2021–2022
- CO 342: Introduction to Graph Theory — one term, 2022
- CO 351: Network Flow Theory — one term, 2021
- CO 370: Deterministic OR Models — one term, 2023
- CO 442: Graph Theory — two terms, 2020–2022

Researcher May–Jul. 2018
University of Texas at Tyler, Tyler TX, USA

- Studied and characterized special inverse semigroups arising from C^*-algebras and path categories.

Research Assistant Jun.–Aug. 2017
University of Miami, Miami FL, USA

- Applied signal processing techniques to the detection of earthquakes along faultines, programmed in MATLAB.

Publications and preprints

1. A. Geisler, M. Kang, M. Sarantis, R. Wdowinski, **Counting independent sets in percolated graphs via the Ising model**, arXiv:2504.08715 (2025), submitted.
2. R. Wdowinski, **Bounded degree graphs and hypergraphs with no full rainbow matchings**, arXiv:2401.06029 (2024), submitted.
3. P. Haxell, R. Wdowinski, **Constructing graphs with no independent transversals**, *Electron. J. Combin.* 31(2) (2024), P2–39.
4. S. Cambie, P. Haxell, R. Kang, R. Wdowinski, **A precise condition for independent transversals in bipartite covers**, *SIAM J. Discrete Math.* 38(2) (2024), 1451–1461.
5. P. Haxell, R. Wdowinski, **Degree criteria and stability for independent transversals**, *J. Graph Theory* 106(2) (2024), 352–371.
6. R. Wdowinski, **On an f-coloring generalization of linear arboricity of multigraphs**, *Discrete Math.* 347(2) (2024), 113777.
7. R. Wdowinski, **Orientation-based edge-colorings and linear arboricity of multigraphs**, *J. Graph Theory* 102(4) (2023), 633–647.
8. A. Donsig, J. Gensler, H. King, D. Milan, R. Wdowinski, **On zigzag maps and the path category of an inverse semigroup**, *Semigroup Forum* 100 (2020), 790–805.
9. E. Blaisdell, A. Gyárfás, R. A. Krueger, R. Wdowinski, **Partitioning the power set of $[n]$ into C_k-free parts**, *Electron. J. Combin.* 26(3) (2019), P3–38.

Presentations

Conferences and Workshops

1. Degree conditions for independent transversals. SFB Kick-off Event, Payerbach, Austria, Sep. 2024.
2. Bounded degree (hyper)graphs with no transversals. Fulkerson 100, Waterloo ON, Canada, Jul. 2024.
3. Bounded degree hypergraphs with no full rainbow structures. SIAM Conference on Discrete Mathematics (DM24), Spokane WA, USA, Jul. 2024.
4. Linear arboricity and its f-coloring generalization via orientations. CanaDAM 2023, Winnipeg MB, Canada, Jun. 2023.
5. The linear arboricity of sparse multigraphs via orientations. 26th Ontario Combinatorics Workshop, Waterloo ON, Canada, May 2022.
6. Characterization of zigzag inverse semigroups. Mathfest 2018, Denver CO, USA, Aug. 2018.

Seminar presentations

1. Degree conditions for independent transversals. Advanced Topics in Discrete Mathematics seminar at TU Graz. Graz, Austria, Mar. 2025.
2. Degree conditions for independent transversals. Combinatorics, Geometry and Topology seminar at ISTA. Klosterneuburg, Austria, Feb. 2025.
3. Constructing graphs with no independent transversals. Graphs and Matroids Seminar at University of Waterloo. Waterloo ON, Canada, Mar. 2024.
4. An f-coloring generalization of linear arboricity. Graphs and Matroids Seminar at University of Waterloo. Waterloo ON, Canada, Mar. 2023.
5. Linear arboricity and its f-coloring generalization via orientations. Invited talk at the Discrete Math Seminar at Georgia State University. Online, Oct. 2022.
6. The linear arboricity of sparse multigraphs via orientations. Graphs and Matroids Seminar at University of Waterloo. Waterloo ON, Canada, Jun. 2022.
7. Partitioning the power set of $[n]$ into C_k-free parts. Budapest Semesters in Mathematics. Budapest, Hungary, Dec. 2018.
8. Higher-order Szegő theorems. Science in a Flash recruitment event. Rice University, Houston TX, USA, Apr. 2018.
9. Recurrent behavior in a nonlinear oscillator chain. Geometry Lab. Rice University, Houston TX, USA, Apr. 2017.

Awards

University of Waterloo

1. SIAM Student Travel Award 2024
2. Ontario Graduate Scholarship + President's Graduate Scholarship 2023–2024
   One of only five recipients for the 2023 Waterloo international competition
3. International Doctoral Student Award 2021–2024
4. Sinclair Graduate Scholarship 2021
5. Combinatorics and Optimization Graduate Award 2021, 2023
6. International Master's Award of Excellence 2019–2021

Rice University

1. Trustee Distinguished Scholarship 2015–2019
2. Lynn L. Elsenhanns Scholarship for mathematical sciences 2018–2019
3. Stephen B. Smith Scholarship (Study abroad scholarship) 2018
4. Judges Choice Award for Science in a Flash (Presentation award) 2018

Additional activity

1. Refereed for: Proceedings of American Mathematical Society, Random Structures and Algorithms, Electronic Journal of Combinatorics, Journal of Graph Theory, Discrete Mathematics, Discrete Applied Mathematics, European Journal of Mathematics.
2. 1-week research visit at ISTA: Hosted by Matthew Kwan, Feb. 2025.
3. DIMEA Combinatorial Potluck 2024: Joint meeting of groups from Brno, Graz, ISTA, and Passau about probabilistic and extremal combinatorics, Brno, Czechia, Nov. 2024.
4. SLMath Summer School: Concentration inequalities and localization techniques in high dimensional probability and geometry. Berkeley CA, USA, Jul. 2023.
5. Budapest Semesters in Mathematics. Study abroad, Budapest, Hungary, Sep.–Dec. 2018.