

THIAGO HOLLEBEN

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EDUCATION

Universidade Federal do Rio de Janeiro, Brazil *March 2016 - July 2017 (interrupted)*

Major in Mathematics

Universidade Federal do Rio de Janeiro, Brazil *July 2017 - 2020*

Bachelor in Applied Mathematics

Universidade Federal do Rio de Janeiro, Brazil *August 2019 - December 2021*

Master's degree in Mathematics

Dissertation title: [The log-concavity of chromatic polynomials](#).

Advisor: Seyed Hamid Hassanzadeh

Dalhousie University, Canada *September 2022 - current*

PhD in Mathematics

Advisor: Sara Faridi

ACADEMIC ACHIEVEMENTS

Jane Street Graduate Research Fellowship Award Honorable mention (2024)

Professor Michael Edelstein Memorial Graduate Prize (2023)

Annual prize awarded to a graduate student who shows great promise in the mathematical sciences.

Honours undergraduate research project (2018)

Received an award for best undergraduate research project on the algebraic and combinatorial properties of Edge Ideals.

Advisor: Seyed Hamid Hassanzadeh

PAPERS

1. *The weak Lefschetz property of whiskered graphs*. Lefschetz Properties. SLP-WLP 2022. Springer INdAM Series, vol 59. Springer, Singapore. doi.org/10.1007/978-981-97-3886-1_5. With Susan M. Cooper, Sara Faridi, Lisa Nicklasson, Adam Van Tuyl. [arxiv:2306.04393](https://arxiv.org/abs/2306.04393)
2. *The weak Lefschetz property and mixed multiplicities of monomial ideals*. J Algebr Comb 60, 295–317 (2024). <https://doi.org/10.1007/s10801-024-01337-8>. [arxiv:2306.13274](https://arxiv.org/abs/2306.13274).
3. *Computing homotopy type and homological invariants of independence complexes of ternary graphs*. (2023) With Sara Faridi. [arXiv:2311.07727](https://arxiv.org/abs/2311.07727) (Submitted)
4. *Lefschetz properties of squarefree monomial ideals via Rees algebras*. (2024) [arxiv:2404.12471](https://arxiv.org/abs/2404.12471). (Journal of Algebra, pending minor revisions)

PREPRINTS AT FINAL STAGE

1. *The third power of extremal ideals are Scarf*. With Trung Chau, Art Duval, Sara Faridi, Susan Morey, Liana Şega.
2. *Pseudo-manifolds arising from very well-covered graphs and grafted simplicial complexes*. With Susan M. Cooper, Sara Faridi, Lisa Nicklasson, Adam Van Tuyl.
3. *Roller coasters, Perazzo forms and independence polynomials*. With Susan M. Cooper, Sara Faridi, Lisa Nicklasson, Adam Van Tuyl.

PAPERS IN PROGRESS

1. *Artinian reductions of monomial ideals: stresses, orientability and Macaulay duality* (Tentative title)
2. *Edge ideals of weighted oriented forests via polarization*. With Manohar Kumar. (Tentative title)
3. *Macaulay duality, complete intersections and graphical arrangements*. With Nancy Abdallah. (Tentative title)
4. *Probabilistic parking processes*. With Steve Butler, Pamela E. Harris, J. Carlos Martínez Mori, Amanda Priestley, Keith Sullivan, Per Wagenius.
5. *Geometric vertex decomposability via binary trees*. With Sergio da Silva. (Tentative title)
6. *Flag spheres, Delannoy numbers and ternary graphs*. With Margaret Bayer, Rick Danner, Marie Kramer, Yirong Yang. (Tentative title)
7. *Algebraic properties of extremal ideals*. With Trung Chau, Art Duval, Sara Faridi, Susan Morey, Liana Şega. (Tentative title)

PRESENTATIONS

1. *Simplicial complexes arising from integer programs*. Graduate Online Combinatorics Colloquium. October 2024. (online talk, tentative title)
2. *Inverse PDE problems in Geometry*. Dalhousie graduate student seminar. September 2024. (talk)
3. *Inverse PDE problems in Combinatorics*. Dalhousie honours student seminar. September 2024. (talk)
4. *Lefschetz properties and analytic spread*. Combinatorics and Geometry in Ioannina. September 2024 (talk)
5. *Roller-Coaster, graphs and Perazzo forms*. Uweifest, Notre Dame university. August 2024 (poster)
6. *Roller-Coaster, graphs and Perazzo forms*. Joint AMS-UMI meeting, Palermo. July 2024 (invited talk)
7. *Lefschetz properties of squarefree monomial ideals via Rees algebras*. Lefschetz properties in Algebra, Geometry, Topology and Combinatorics, Poland. June 2024 (talk)
8. *Lefschetz properties of monomial ideals via Rees algebras*. AMS Sectional meeting, San Francisco. May 2024 (invited talk)
9. *Lefschetz properties of monomial ideals via Rees algebras*. COMA/NAG Graduate seminar, MSRI/SLMath. May 2024 (invited talk)
10. *Lefschetz properties and mixed multiplicities*. Recent developments in Commutative Algebra, MSRI/SLMath. April 2024 (poster)
11. *Powers of a simplex: Resolutions meet Partitions*. Combinatorial Algebra meets Algebraic Combinatorics, Montreal. January 2024 (talk)
12. *Positivity through analytic spread*. Connections workshop, MSRI/SLMath. January 2024 (poster)
13. *Rees algebras and Lefschetz properties of squarefree monomial ideals*. Commutative Algebra section: Canadian Mathematics Society winter meeting, Montreal. December 2023 (invited talk)
14. *Rees algebras and Lefschetz properties of squarefree monomial ideals*. Stockholm Commutative Algebra seminar. October 2023 (online talk)

15. *Lefschetz properties of squarefree monomial ideals*. 10th Heidelberg Laureate Forum, Heidelberg University, Germany. September 2023 (poster, lightning talk)
16. *Algebraic geometry in the wild*. Dalhousie graduate student seminar. October 2023 (talk)
17. *Unimodality and log-concavity in Mathematics*. Dalhousie honours student seminar. October 2023 (talk)
18. *Lefschetz properties of squarefree monomial ideals*. BrianFest, University of Lincoln-Nebraska. August 2023 (poster)
19. *Homological Invariants of ternary graphs*. 34o Colóquio Brasileiro de Matemática, Instituto de Matemática Pura e Aplicada, Brazil. July 2023 (poster)
20. *The weak Lefschetz property and mixed multiplicities of monomial ideals*. MSRI/SLMath Summer School: Commutative Algebra and its Interaction with Algebraic Geometry, Notre Dame university. May 2023 (poster)
21. *Degree of the inverse of a birational monomial map*. MSRI/SLMath Summer School: Commutative Algebra and its Interaction with Algebraic Geometry, Notre Dame university. May 2023 (lightning talk)
22. *The weak Lefschetz property and mixed multiplicities of monomial ideals*. Workshop on Lefschetz Properties in Algebra, Geometry, Topology and Combinatorics, Fields institute. May 2023 (talk)
23. *Lefschetz properties and mixed multiplicities via hyperplane arrangements*. International Centre for Theoretical Physics workshop, Italy. May 2023 (poster)
24. *The weak Lefschetz property and mixed multiplicities of squarefree monomial ideals*. International Centre for Theoretical Physics summer school, Italy. May 2023 (talk)
25. *Homological invariants of ternary graphs*. Banff International Research Station workshop: Interactions Between Topological Combinatorics and Combinatorial Commutative Algebra. April 2023 (talk)
26. *Homological invariants of ternary graphs*. Southern Regional Algebra Conference, Tulane university. March 2023 (online talk)
27. *Homological invariants of ternary graphs*. Combinatorial Algebra meets Algebraic Combinatorics, Waterloo University. January 2023 (poster)
28. *The log-concavity of chromatic polynomials*. Universidade Federal do Rio de Janeiro, Brazil. July 2022 (talk, in portuguese)
29. *Exploring examples with Macaulay2*. Universidade Federal do Rio de Janeiro, Brazil. July 2022 (talk, in portuguese)
30. *Hilbert functions in Combinatorics*. Universidade Federal do Rio de Janeiro, Brazil. July 2022 (talk, in portuguese)
31. *A combinatorial interpretation of the primary decomposition of edge ideals*. Universidade Federal do Rio de Janeiro undergraduate student seminar, Brazil. 2019 (talk, in portuguese)
32. *A brief dictionary between Algebra and Combinatorics*. Semana de Integração Acadêmica da Universidade Federal do Rio de Janeiro, Brazil 2018 (talk, in portuguese)

TEACHING POSITIONS

Instructor: Engineering Mathematics II at Dalhousie Univeristy

Summer of 2023

Teaching assistant at Dalhousie university

Fall of 2022 - current

Teaching assistant at Universidade Federal do Rio de Janeiro

First semester of 2019

Teaching assistant at Universidade Federal do Rio de Janeiro

First and second semester of 2018

LEADERSHIP POSITIONS

Organizer of Week of Applied Mathematics and Mathematical Engineering (SEM²Ap)

Organized virtual Week of Applied Mathematics and Mathematical Engineering (SEM²Ap) in 2020

More info on: [Webpage](#), [Youtube](#), [Instagram](#)

Organizer of weekly student seminar at Universidade Federal do Rio de Janeiro

Organized weekly seminars at Universidade Federal do Rio de Janeiro during the second semester of 2019.

SKILLS

Programming: Macaulay2, Sage, Python, Javascript, Julia