

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.* (2023) With Susan M. Cooper, Sara Faridi, Lisa Nicklasson, Adam Van Tuyl. [arxiv:2306.04393](#). Lefschetz Properties: Current and New Directions, Springer INdAM series, to appear.
2. *The weak Lefschetz property and mixed multiplicities of monomial ideals.* (2023) [arxiv:2306.13274](#). Journal of Algebraic Combinatorics, to appear.
3. *Computing homotopy type and homological invariants of independence complexes of ternary graphs.* (2023) With Sara Faridi. [arXiv:2311.07727](#) (Submitted)
4. *Lefschetz properties of squarefree monomial ideals via Rees algebras.* (2024) [arxiv:2404.12471](#). (Submitted)

IN PROGRESS

1. *Powers of a simplex.* With Trung Chau, Art Duval, Sara Faridi, Susan Morey, Liana Şega.
2. *On the weak Lefschetz properties of squarefree Gotzmann ideals.* With Sara Faridi.
3. *Pseudomanifolds, generalized whiskerings and the weak Lefschetz property.* With Susan M. Cooper, Sara Faridi, Lisa Nicklasson, Adam Van Tuyl.
4. *Edge ideals of weighted oriented forests via polarization.* With Manohar Kumar.

PRESENTATIONS

1. *Lefschetz properties and mixed multiplicities*. Recent developments in Commutative Algebra, MSRI/SLMath. April 2024 (poster)
2. *Powers of a simplex: Resolutions meet Partitions*. Combinatorial Algebra meets Algebraic Combinatorics, Montreal. January 2024 (talk)
3. *Positivity through analytic spread*. Connections workshop, MSRI/SLMath. January 2024 (poster)
4. *Rees algebras and Lefschetz properties of squarefree monomial ideals*. Commutative Algebra section: Canadian Mathematics Society winter meeting, Montreal. December 2023 (invited talk)
5. *Rees algebras and Lefschetz properties of squarefree monomial ideals*. Stockholm Commutative Algebra seminar. October 2023 (online talk)
6. *Lefschetz properties of squarefree monomial ideals*. 10th Heidelberg Laureate Forum, Heidelberg University, Germany. September 2023 (poster, lightning talk)
7. *Algebraic geometry in the wild*. Dalhousie graduate student seminar. October 2023 (talk)
8. *Unimodality and log-concavity in Mathematics*. Dalhousie honours student seminar. October 2023 (talk)
9. *Lefschetz properties of squarefree monomial ideals*. BrianFest, University of Lincoln-Nebraska. August 2023 (poster)
10. *Homological Invariants of ternary graphs*. 34o Colóquio Brasileiro de Matemática, Instituto de Matemática Pura e Aplicada, Brazil. July 2023 (poster)
11. *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)
12. *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)
13. *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)
14. *Lefschetz properties and mixed multiplicities via hyperplane arrangements*. International Centre for Theoretical Physics workshop, Italy. May 2023 (poster)
15. *The weak Lefschetz property and mixed multiplicities of squarefree monomial ideals*. International Centre for Theoretical Physics summer school, Italy. May 2023 (talk)
16. *Homological invariants of ternary graphs*. Banff International Research Station workshop: Interactions Between Topological Combinatorics and Combinatorial Commutative Algebra. April 2023 (talk)
17. *Homological invariants of ternary graphs*. Southern Regional Algebra Conference, Tulane university. March 2023 (online talk)
18. *Homological invariants of ternary graphs*. Combinatorial Algebra meets Algebraic Combinatorics, Waterloo University. January 2023 (poster)
19. *The log-concavity of chromatic polynomials*. Universidade Federal do Rio de Janeiro, Brazil. July 2022 (talk, in portuguese)

20. *Exploring examples with Macaulay2*. Universidade Federal do Rio de Janeiro, Brazil. July 2022 (talk, in portuguese)
21. *Hilbert functions in Combinatorics*. Universidade Federal do Rio de Janeiro, Brazil. July 2022 (talk, in portuguese)
22. *A combinatorial interpretation of the primary decomposition of edge ideals*. Universidade Federal do Rio de Janeiro undergraduate student seminar, Brazil. 2019 (talk, in portuguese)
23. *A brief dictionary between Algebra and Combinatorics*. Semana de Integração Acadêmica da Universidade Federal do Rio de Janeiro, Brazil 2018 (talk, in portuguese)

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](#)

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

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