# 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 Combiantorics (pending minor revisions)
3. *Computing homotopy type and homological invariants of independence complexes of ternary graphs.* (2023) With Sara Faridi. arXiv:2311.07727 (Submitted)
4. *Rees algebras, Symbolic powers and Lefschetz properties of squarefree monomial ideals.* (to be submitted in April)

## 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. *Powers of a simplex: Resolutions meet Partitions.* Combinatorial Algebra meets Algebraic Combinatorics, Montreal. January 2024
2. *Positivity through analytic spread.* Connections workshop, MSRI/SLMath. January 2024.
3. *Rees algebras and Lefschetz properties of squarefree monomial ideals.* Commutative Algebra section: Canadian Mathematics Society winter meeting, Montreal. December 2023 (invited talk)
4. *Rees algebras and Lefschetz properties of squarefree monomial ideals.* Stockholm Commutative Algebra seminar. October 2023 (online talk)
5. *Lefschetz properties of squarefree monomial ideals.* 10th Heidelberg Laureate Forum, Heidelberg University, Germany. September 2023 (poster, lightning talk)
6. *Algebraic geometry in the wild.* Dalhousie graduate student seminar. October 2023 (talk)
7. *Unimodality and log-concavity in Mathematics.* Dalhousie honours student seminar. October 2023 (talk)
8. *Lefschetz properties of squarefree monomial ideals.* BrianFest, University of Lincoln-Nebraska. August 2023 (poster)
9. *Homological Invariants of ternary graphs.* 34o Colóquio Brasileiro de Matemática, Instituto de Matemática Pura e Aplicada, Brazil. July 2023 (poster)
10. *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)
11. *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)
12. *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)
13. *Lefschetz properties and mixed multiplicities via hyperplane arrangements.* International Centre for Theoretical Physics workshop, Italy. May 2023 (poster)
14. *The weak Lefschetz property and mixed multiplicities of squarefree monomial ideals.* International Centre for Theoretical Physics summer school, Italy. May 2023 (talk)
15. *Homological invariants of ternary graphs.* Banff International Research Station workshop: Interactions Between Topological Combinatorics and Combinatorial Commutative Algebra. April 2023 (talk)
16. *Homological invariants of ternary graphs.* Southern Regional Algebra Conference, Tulane university. March 2023 (online talk)
17. *Homological invariants of ternary graphs.* Combinatorial Algebra meets Algebraic Combinatorics, Waterloo University. January 2023 (poster)
18. *The log-concavity of chromatic polynomials.* Universidade Federal do Rio de Janeiro, Brazil. July 2022 (talk, in portuguese)
19. *Exploring examples with Macaulay2.* Universidade Federal do Rio de Janeiro, Brazil. July 2022 (talk, in portuguese)

20. *Hilbert functions in Combinatorics.* Universidade Federal do Rio de Janeiro, Brazil. July 2022 (talk, in portuguese)

21. *A combinatorial interpretation of the primary decomposition of edge ideals.* Universidade Federal do Rio de Janeiro undergraduate student seminar, Brazil. 2019 (talk, in portuguese)

22. *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 (SEM$^2$Ap)**
Organized virtual Week of Applied Mathematics and Mathematical Engineering (SEM$^2$Ap) 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