# Abel Romer <span style="float:right">Mathematics M.Sc.</span>

**CONTACT INFORMATION**

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GitHub: https://github.com/ahblay

**EDUCATION**

**University of Victoria**, Victoria, British Columbia
M.A.Sc, concentration in Discrete Mathematics *Sep. 2020 - Sep. 2022*
Advisors: Dr. Peter Dukes, Dr. Jonathan Noel
Thesis: *Tight Bounds on 3-Neighbor Bootstrap Percolation*
Cumulative GPA: 4.0 out of 4.0

**Quest University Canada**, Squamish, British Columbia
B.A.Sc, concentration in Mathematics and Computer Science *Sep. 2012 - May 2017*
Advisors: Dr. Glen Van Brummelen
Thesis: *Winning Dots-and-Boxes in Two and Three Dimensions*
Cumulative GPA: 3.81 out of 4.0

**St. Olaf College**, Northfield, Minnesota, USA
Budapest Semesters in Mathematics *Fall 2015*
Cumulative GPA: 3.87 out of 4.0

**PUBLICATIONS**

Dukes, P., Noel, J., & Romer, A. (2023). Extremal Bounds for 3-Neighbor Bootstrap Percolation in Dimensions Two and Three. *SIAM Journal on Discrete Mathematics*, 37(3), 2088–2125. doi:10.1137/22M1534195

Romer, A. E. (2022). Tight bounds on 3-neighbor bootstrap percolation [Master's thesis, University of Victoria]. UVicSpace. https://dspace.library.uvic.ca/handle/1828/14170.

**SCHOLARSHIPS AND AWARDS**

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|---|---|
| UVic Graduate Award, University of Victoria | *Fall 2020 - Fall 2022* |
| President's Honors Award, Quest University Canada | *Spring 2013, Fall 2014, Spring 2015* |
| President's Scholarship, Quest University Canada | *Sep. 2012 – May 2017* |
| Quest University Canada Scholarship, Quest University Canada | *Sep. 2012 – May 2017* |

**PROFESSIONAL EXPERIENCE**

**Technical Solutions Specialist** *May 2023 – Feb. 2024*
Hypercharge Networks, Inc., Vancouver, BC
*Git, GitHub, Typescript, React.js, Next.js, Salesforce, Visualforce, HTML, SQL, Python*

- Built and documented Salesforce API integration to securely pass data to internal dashboards and provide daily performance updates to leadership team.
- Contributed to internal documentation for Salesforce usage and led meetings with department heads outlining technical procedures.
- Managed projects with Hardware and Sales directors to design Salesforce configuration, and improve order fulfillment efficiency and data integrity.
- Mentored interns through pair programming and code review sessions.
- Wrote automated Postman test suite for remote charging REST API.

**Freelance Web Developer** *Nov. 2017 – Aug. 2018*
Self-employed, Vancouver, BC

- Designed and implemented a web framework for a Python-based linear optimization solution to employee scheduling.

- Implemented server side request handling with Python Flask and MongoDB, algorithmic optimization with PuLP, and client side interfacing in HTML, CSS, Javascript and JQuery.

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| TEACHING EXPERIENCE | **Private Tutor** | *Feb. 2024 – present* |

Self-employed, Los Angeles, CA

*Pre-Calc, Geometry, Algebra*

- Provide one-on-one remedial math instruction in preparation for HSE tests.
- Explore alternative teaching methods to facilitate long-lasting understanding of techniques and procedures.

**Teaching Assistant** *Sep. 2020 – Sep. 2022*

University of Victoria, Victoria, BC

*Graph Theory, Combinatorics, Logic, Calculus*

- Taught problem-solving-focused labs in calculus, designed to scaffold students' understanding and foster deep intuition for fundamental concepts.
- Prepared lesson plans and gave lectures to graduate and undergraduate students.
- Used analogy and examples to provide students with confidence and depth of understanding.

**Teaching Assistant** *Sep. 2013 – May 2016*

Quest University Canada, Squamish, BC

*Calculus I-III, Rhetoric, Spherical Trigonometry*

- Hosted 200+ hours of drop-in sessions, assisting students with both rhetorical and quantitative coursework.
- Provided instruction and feedback to students on writing rhetorical and scientific papers, and mathematics.
- Taught rememdial math to struggling students, with a focus on developing intuition through analogy.

TALKS **Thesis Defense**, University of Victoria *Sep. 2022*
- Tight Bounds on 3-Neighbor Bootstrap Percolation
- Slides: `https://www.abelromer.com/static/defense.pdf`

**Undergraduate Guest Lecture**, University of Victoria *Apr. 2021*
- Dependent Random Choice: A Brief Introduction
- Slides: `https://www.abelromer.com/static/drc.pdf`

**Discrete Math Seminar**, University of Victoria *Oct. 2021*
- Tight Bounds on 3-Neighbor Bootstrap Percolation

**Keystone Symposium**, Quest University Canada *Apr. 2017*
- The Theory of Dots-and-Boxes in Higher Dimensions

MATHEMATICAL WRITING *Supersaturation and Generalizations of Sperner's Theorem*
Review Paper
`https://www.abelromer.com/static/extremal.pdf` (2021)

*Dependent Random Choice*
Review Paper
`https://www.abelromer.com/static/combo.pdf` (2021)

*Winning Dots-and-Boxes in Two and Three Dimensions*
Quest University Senior Thesis

`https://www.abelromer.com/static/dandb.pdf` (2017)

*Differential Equations*
Sample Lecture Notes
`https://www.abelromer.com/static/day_1.pdf` (2021)

*Linear Algebra and Bootstrap Percolation*
Sample Lecture Notes
`https://www.abelromer.com/static/labp.pdf` (2021)

VOLUNTEER
EXPERIENCE

Research Assistant                                           *Jan. 2017 – Feb. 2017*
Sonoma State University, Rohnert Park, CA
  – Attended two-day Make the Way conference on professional development for
    mathematics educators.
  – Wrote lesson plans for Math Teacher Circles, designed to give investigative learn-
    ing experiences to high school teachers.

Journal Founder and Editor                                   *Sep. 2014 – May 2016*
Momenta: Quest Academic Journal, Squamish, BC
  – Edited and laid the groundwork for the first edition of Quest's student-run aca-
    demic journal
  – Attended organizational meetings and held workshops to guide peers through
    the review process

TECHNICAL
SKILLS

Languages: Python, LaTeX, Java, Javascript, HTML5, CSS, React,js, Visualforce, Typescript

Databases: MongoDB, SQLite, MySQL, Postgres

Version Control/OS/Libraries/Other: Git, GitHub, UNIX (macOS), Pandas, PuLP