

CONTACT
INFORMATION*Phone:* ██████████*Email:* ██████████*LinkedIn:* <https://www.linkedin.com/in/abel-romer>*Website:* <https://www.abelromer.com>

OVERVIEW

Programmer with five years experience in full-stack web development, optimization, and mathematical research. Efficient learner and articulate teacher, with nine years of tutoring experience and academic collaboration. Accomplished self-starter with successful projects ranging from mathematical optimization software to tools facilitating novel discoveries in academic research.

SKILLS

Python, Java, Javascript, JQuery, HTML, CSS, \LaTeX , JSON, PostgreSQL, SQLAlchemy, MongoDB, Pandas, SciKitLearn, Jupyter, Linux, Git, GitHub.

PROJECTS

Academic Researcher, Victoria, BC*Jan. 2021 – Aug. 2022**Bootstrap Percolation Visualization Tool*

- Launched a full-stack web application for researchers to visualize extremal bootstrap percolation, enabling the discovery of over 25 new initial states to date.
- Discovered a novel recursive technique for constructing percolating sets, and determined the extremal number of all 3-neighbor percolating sets in 3-dimensions for grids of size ≥ 11 .
- Established a new upper bound on the extremal bootstrap percolation number for the 3-torus, within 1 of the existing lower bound for all tori of size ≥ 12 .

Application Developer, Vancouver, BC*Nov. 2017 – Aug. 2018**Mosaic Scheduling*

- Created a Python-based web app to optimize employee satisfaction in scheduling, enabling small businesses to reduce the cost of timetable organization by up to 90%.
- Adapted an instance of the Nurse Scheduling Problem to computationally resolve restaurant scheduling conflicts in under 15 minutes.
- Applied RESTful design practices to build a scheduling API, with relevant unit tests and relational database design.
- Designed front-end interfaces to efficiently obtain preference data from 40+ employees.

Academic Programmer, Victoria, BC*May 2022**Typesetting Optimization*

- Applied dynamic programming techniques to optimize line-breaks in word processing software, improving the spacing between words in left- and right-justified text by more than 50% over naive solutions.
- Implemented the algorithm initially published by Donald Knuth in the 1981 article *Breaking Paragraphs Into Lines*.

Data Engineer, Vancouver, BC*Jun. 2019 – Jul. 2019**Facial Recognition Software*

- Designed computer vision facial recognition software using Adam Geitgey's `face_recognition` Python library to identify and remember up to 10 individuals.

Front End Developer, Vancouver/Victoria, BC*Jan. 2020 – May 2020**Personal Webpage*

- Developed and deployed Python-based static portfolio website using Netlify and Google Search Console. Website located at: <https://www.abelromer.com>.

EDUCATION	<p>University of Victoria, Victoria, BC <i>Sep. 2020 – Aug. 2022</i> <i>M.Sc., Mathematics</i> <i>GPA 4 out of 4</i></p> <p>Quest University, Squamish, BC <i>Sep. 2012 – May 2017</i> <i>B.A.Sc., Mathematics</i> <i>GPA 3.81 out of 4</i></p> <p>Budapest Semesters in Mathematics, Budapest, Hungary <i>Sep. 2015 – Dec. 2015</i> <i>Mathematics</i> <i>GPA 3.87 out of 4</i></p>
AREAS OF STUDY	Combinatorial optimization, graph theory, extremal combinatorics, algebraic methods in combinatorics, front and back end web development, machine learning, differential equations, multivariable calculus, linear algebra, abstract algebra, real analysis, theoretical computer science, and number theory.
PUBLICATIONS	<p>Dukes, P. J., Noel, J. A., & Romer, A. E. (2022). <i>Extremal Bounds for Three-Neighbour Bootstrap Percolation in Dimensions Two and Three</i>. doi:10.48550/ARXIV.2209.07594</p> <p>Romer, A. E. (2022). <i>Tight bounds on 3-neighbor bootstrap percolation</i> [Master’s thesis, University of Victoria]. UVicSpace. https://dspace.library.uvic.ca/handle/1828/14170.</p>
SCHOLARSHIPS AND AWARDS	<p>UVic Graduate Award, University of Victoria <i>Sep. 2020 – Aug. 2022</i></p> <p>President’s Honors Award, Quest University Canada <i>Spring 2013, Fall 2014, Spring 2015</i></p> <p>President’s Scholarship, Quest University Canada <i>Sep. 2012 – May 2017</i></p> <p>Quest University Canada Scholarship, Quest University Canada <i>Sep. 2012 – May 2017</i></p>
EXPERIENCE	<p>Teaching Assistant, Victoria, BC <i>Sep. 2020 - May 2022</i> <i>University of Victoria</i></p> <ul style="list-style-type: none"> ◦ Led weekly tutorials in first year calculus to 40-student classes. ◦ Gained over 300 hours of experience in individual tutoring and marking for calculus, linear algebra, logic, and discrete mathematics. <p>Teaching Assistant, Rohnert Park, CA <i>Jan. 2017 – Feb. 2017</i> <i>Sonoma State University</i></p> <ul style="list-style-type: none"> ◦ Helped establish a Math Teacher Circle in Sonoma County, CA. ◦ Prepared class plans on Pick’s Theorem, Archimedes’ Principle, and Tilings of the Plane designed to focus self-guided learning (see https://www.abelromer.com/static/mtc1.pdf). <p>Peer Tutor, Squamish, BC <i>Sep. 2013 - May 2016</i> <i>Quest University Canada</i></p> <ul style="list-style-type: none"> ◦ Attended 35 hours of educational training seminars and clocked over 180 hours of individual tutoring experience. ◦ Mentored students in calculus, differential equations, spherical trigonometry and rhetoric. <p>Journal Founder and Editor, Squamish, BC <i>Sep. 2014 – May 2016</i> <i>Momenta: Quest Academic Journal</i></p> <ul style="list-style-type: none"> ◦ Co-founded and edited Quest University’s student-run academic journal. ◦ Organized meetings and workshops to educate students on the peer review process.