

# LOUIS-ROY LANGEVIN

M.SC. IN MATHEMATICS WITH STRONG BACKGROUND IN ALGORITHMS AND SOFTWARE DEVELOPMENT, SEEKING SOFTWARE ENGINEER / QUANTITATIVE RESEARCHER ROLE.

## EDUCATION

**Master of Science (M.Sc.) Mathematics and Statistics (Thesis)** Sep 2024 - Apr 2026  
Algorithmic Game Theory | Prof. Adrian Vetta

**(B. Sc.) Honours Mathematics and Computer Science**  
McGill University (3.91/4.0 GPA) Sep 2021 - Apr 2024

## WORK AND VOLUNTEERING

**AI trainer for Outlier (2024-2025)** *LaTeX*  
*LLM*

- Training large language models by creating and solving math and coding problems.
- Comparing prompts and writing test cases to improve AI models' programming abilities.
- Achieved full marks on the math training and ranked as a top-tier worker.

**Volunteer for McGill's competitive programming summer camp (2024 and 2025)**

- Taught important algorithms and data structures to high school and cégep students.
- Took part in the selection committee to carefully choose the students who would participate.
- Prepared activities, slides, food, etc., and maintained the good flow of the camp.

**Tutoring + Educational platform online**

- Hundreds of hours of tutoring in math and physics at all levels.
- Teaching assistant at McGill University in calculus, real analysis, and discrete math.
- Educational content creator with 16 000 followers on social media ([@le\\_cegepien](#)).
- Sold and taught private preparation classes for calculus with 50+ registered students.

## RESEARCH EXPERIENCE ([My publications](#))

**Probabilistic analysis of algorithms (2024)** *C++*

- Full-time project at McGill University financed by the *NSERC USRA*.
- Designing and analyzing algorithms on [Uniform Attachment Trees](#), proved 4 distinct results.
- Wrote a time & memory efficient C++ script ([here](#)) to help understand large random trees.


**Graph theory report (2023)** *NP-Hardness*  
*C++*  
*Python*

- Full-time project at McGill University financed by the *NSERC USRA*.
- Wrote a complete study report of proofs on the [Burning Number conjecture](#).
- Implemented linear programs in **C++** to study the NP-hardness of the conjecture.


**Subelliptic operators report (2022)** *MATLAB*  
*Maple*  
*Java*

- Full-time research at Dalhousie University funded by the *ISM* scholarship.
- Designed clever mathematical tools to find eigenfunctions of the [Grushin operator](#).
- Studied normally distributed Legendre functions using Java to find their zero-sets.


## PROJECTS

**String protagonist  (team)**


- A guitar hero game but with a real guitar, implemented in 36 hours.
- Interactive front-end with animations coded in **React** and **TypeScript**.
- Achieved 90% accuracy in pitch detection using **Fast Fourier Transforms**, **Web Assembly**, and a **Rust neural network**.

**Assembly fractal generator  (individual)**

- An **MIPS assembly** program that generates different kinds of fractals depending on the parameters the user gives it using complex numbers.
- Additional feature that uses the randomness of complex square roots to draw the boundary of any given Julia set.

**Assembly image matcher  (individual)**

- An **MIPS assembly** program that takes one big image and iterates through it to find any occurrence of some given smaller image.
- Implemented in a cache-friendly way to optimize the speed by more than **500%**. Adapted to fully-associative and direct mapped caches.

**Library free neural network  (individual)**


- Python script that creates neural networks without using any library.
- Formulated a unique gradient descent optimization strategy that improves convergence rates with convex optimization.
- Easily implements basic perceptrons and more complex networks.


## LANGUAGES

Fluent in English and native in French

## CONTACT

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 [LouisRoyLangevin](https://LouisRoyLangevin)

 [louisroylangevin.github.io/](https://louisroylangevin.github.io/)

## COMPETITIONS

**3<sup>rd</sup> place in ICPC** (competitive programming contest) in McGill University (2024)

**International Physics Tournament** at ETH Zürich (Switzerland, 2024) representing Canada

**2<sup>nd</sup> place Hackathon (1375\$)** at McGill Code.Jam() as a programmer (2023)  
Participated to other hackathons as well

**Scored 24** on the W. B. **Putnam** math contest (2023)

**3<sup>rd</sup> place in Quebec** in the COMC math contest (2020)

**1<sup>st</sup> place in Quebec** (250\$) in the AMQ math contest (2019)

## SKILLS

### Programming

C++ / Python / Rust / Java / C / OCaml  
LaTeX  
HTML / CSS / JavaScript / React

### Machine learning

Neural networks / Regression methods / Natural language processing