Samuel Leblanc

 ♦ Kingston, ON
 Image: Samuel Sa

Education

Queen's University Starting Fall 2025

M.Sc. in Mathematics

Université de Sherbrooke 2022 - 2025

B.Sc. in Mathematics

Research Interests

Representation theory, topological data analysis, machine learning, homological algebra.

Papers

- 1. Armenta, M., Leblanc, S., Batalin-Vilkovisky structure on Hochschild cohomology with coefficients in the dual algebra. arXiv:1810.13023 ☑ (2025)
- 2. Leblanc, S., Rasolomanana, A., Armenta, M., Hidden Activations Are Not Enough: A General Approach to Neural Network Predictions. arXiv:2409.13163 🗹 (2024)

Student Papers

- 1. Leblanc, S., Dégénérations des représentations de carquois de type \mathbb{A}_3 à deux puits. To appear in: Cahiers mathématiques de l'Université de Sherbrooke \mathbf{Z} (2024)
 - Supervisors: Emily Cliff and Shiping Liu
- 2. Leblanc, S., Transformations de cercles orientés tangents sur la sphère de Riemann. Submitted in: Cahiers mathématiques de l'Université de Sherbrooke 🗹 (2023)
 Supervisor: Jean-Philippe Burelle

Posters

- 1. Leblanc, S., Multiplicity of the Interval Module. AARMS-CMS Student Poster Session (CMS Summer Meeting) ☑ (2025)
 - Collaborators: Laurianne Baril and Justin Desrochers. Supervisor: Thomas Brüstle.
- 2. Desrochers, J., Leblanc, S., Kernel of the Rank Invariant. Summer Research School, Applications of Representation Theory in Topological Data Analysis and Geometric Invariant Theory (2024)

Teaching

Teaching Assistant

Méthodes quantitatives en communication marketing (MQG301) Winter 2025

École de gestion, Université de Sherbrooke

Calcul vectoriel (MAT298) Fall 2024

Département de mathématiques, Université de Sherbrooke

Statistique appliquée à la gestion (MQG222)

Summer 2024

École de gestion, Université de Sherbrooke

Statistique appliquée à la gestion (MQG222) Winter 2024

École de gestion, Université de Sherbrooke

Grader

Mathématiques discrètes (MAT120)

Département de mathématiques, Université de Sherbrooke

Fall 2024

Tutor

Mathematics, 10th grade

Volunteering with Le Diplôme avant la Médaille 🗹

Summer 2023

2023 - 2024

Algèbre linéaire et géométrie vectorielle (MAT902)

Université de Sherbrooke

Biomécanique humaine (KIN325)

Winter 2023

Université de Sherbrooke

Software

$simple_adversarial_detection$

O GitHub

- Very simple version of the code used for the experiments in the paper Hidden Activations Are Not Enough: A General Approach to Neural Networks Predictions. arXiv:2409.13163
- o Tools: Python

upperhalfplane

O GitHub

- \circ Visualize the action of $PSL(2,\mathbb{R})$ on the upper half plane (Poincaré half plane model) interactively. samueleblanc.com/software/upperhalfplane \mathbb{Z}
- o Tools: CindyJS, JavaScript, HTML, CSS

riemannsphere

🖸 GitHub

- - Supervisor: Jean-Philippe Burelle.
- o Tools: CindyJS, JavaScript, HTML, CSS

MatTalX

○ GitHub

- Chrome Extension and Firefox Add-on that allows the user to convert La-TeX commands into plain text, enabling them to write symbols anywhere. https://mattalx.org ☑
- o Tools: JavaScript, HTML, CSS, Bash

Talks

- 1. Analyse topologique de données (February 13, 2025) Club mathématiques de l'Université de Sherbrooke
- 2. La propagation avant en tant que matrice (November 14, 2024) El Club mathématiques de l'Université de Sherbrooke
- 3. Visualisation de transformations sur la sphère de Riemann (March 21, 2024) 🖹 Club mathématiques de l'Université de Sherbrooke
- 4. Théorie des représentations des réseaux de neurones (October 5, 2023) Club mathématiques de l'Université de Sherbrooke

Academic Activities

Canadian Mathematical Society (CMS) Meeting

Summer 2025

Attended the 2025 CMS Summer Meeting at the Université Laval in Québec, QC. June 7 to 9, 2025.

Research School Summer 2024

Attended the Summer Research School: Applications of Representation Theory in Topological Data Analysis and Geometric Invariant Theory, at the UQAM in Montréal, QC. June 3 to 7, 2024.

Introduction to Research (MAT523): Topological Data Analysis

Optional course. Département de mathématiques, Université de Sherbrooke

Supervisor: Thomas Brüstle

Reading group in category theory

Participated in weekly meeting with graduate students as well as undergraduates

students. Made several talks about the week's readings.

BIRS Workshop

Assisted (online) to the BIRS Workshop: Representation Theory and Topological

Data Analysis. April 8 to 11, 2024.

Research internship: Representation Theory of Quivers

Département de mathématiques, Université de Sherbrooke

Supervisors: Emily Cliff and Shiping Liu

Experimental Mathematics Lab (MAT001): Projective Geometry

Course taken beyond B.Sc. requirements. Département de mathématiques, Univer-

sité de Sherbrooke

Supervisor: Jean-Philippe Burelle

Languages

French (native), English (advanced).

Winter 2024

Winter 2024

Winter 2024

Summer 2023

Winter 2023