

Gabriel Jarry-Bolduc

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DEGREES

- Doctor of Philosophy, mathematics, University of British Columbia (UBC), 2020-2023
Title of thesis: Numerical Analysis for Derivative-Free Optimization
Concentration: Optimization
- Master of Science, mathematics, UBC, 2017-2019
Title of thesis: Calculus Identities for Generalized Simplex Gradients: Rules and Applications
Concentration: Optimization
- Bachelor of Science, Université du Québec à Trois-Rivières, 2014-2017
Concentration: Statistics

EMPLOYMENT

- Assistant Professor, American University of Sharjah (AUS), 2025-Present
- Sessional Instructor, University of Calgary, 2025
- Assistant Professor (tenure-track position), Mount Royal University (MRU), 2024-2025
- Assistant Professor (limited-term position), Saint Francis Xavier University (StFX), 2023-2024
- Sessional Instructor, UBC, 2022-2023

COURSES TAUGHT/TEACHING

- MTH 104: Calculus II, AUS, Summer 2026
- MTH 343: Numerical Analysis, AUS, Summer 2026
- MTH 565: Numerical Analysis (graduate version), AUS, Spring 2026
- MTH 104: Calculus II, AUS, Spring 2026
- MTH 343: Numerical Analysis, AUS, Fall 2025
- MTH 104: Calculus II, AUS, Fall 2025
- MATH249: Introductory Calculus, University of Calgary, Spring 2025
- MATH1200: Calculus I for Scientists, MRU, Winter 2025
- MATH1203: Linear Algebra for Scientists and Engineers, MRU, Fall 2024
- MATH105: Business Mathematics, StFX, Winter 2024
- ENGR/MATH222: Calculus III for Engineers, StFX, Winter 2024
- MATH105: Business Mathematics, StFX, Fall 2023
- MATH236: Data Modeling for Business, StFX, Fall 2023
- MATH101: Integral calculus, UBC, Summer 2023
- MATH100: Differential calculus, UBC, Summer 2023
- MATH125: Pre-Calculus, UBC, Winter 2023
- MATH101: Integral calculus, UBC, Summer 2022
- MATH100: Differential calculus, UBC, Summer 2022

RECOGNITIONS/FUNDINGS (past 5 years)

- Faculty Research Grant, 449,962 AED (~\$168,510), AUS, 2026

- Faculty Start-Up Funds, 168,747 AED (~\$63,195), AUS, 2026
- NSERC Discovery Grant, \$167,500, 2025
- Faculty of Science and Technology Student Research Award, \$6,000, MRU, 2025
- Internal Research Grant Funding, \$7,000, MRU, 2024
- Professional Development Funds, \$1,500, MRU, 2024
- MRU Start-Up Funds, \$7,500, MRU, 2024
- GERAD Postdoctoral Funding (offered), \$70,000, GERAD, 2024
- Postdoctoral Fellowship (offered), \$90,000, Natural Sciences and Engineering Research Council of Canada (NSERC), 2023
- Postdoctoral Fellowship (offered), \$90,000, Fonds de recherche du Québec en nature et technologies (FRQNT), 2023
- University Graduate Fellowship, \$4,000, UBC, 2022
- France Canada Research Fund Award (Co-Applicant), \$13,000, 2022
- University Graduate Fellowship, \$3,000, UBC, 2021
- Canada Graduate Scholarship, \$105,000, NSERC, 2021
- Doctoral Scholarship B2X, \$64,500, Fonds de recherche du Québec Nature et Technologie, 2021

PRESENTATIONS (past 5 years)

CONFERENCE PRESENTATIONS

- *The quest for descent directions*, SIAM Conference on Optimization 2026, Edinburgh, United Kingdom, June 4 2026
- *We need to talk about indeterminate forms of limits*, Alberta Mathematics Dialogue, Edmonton, Canada, May 8 2026
- *The cosine measure of a function*, International Conference on Continuous Optimization, Los Angeles, United States, July 21 2025
- *The cosine measure of a function*, Canadian Mathematical Society Summer Meeting, Québec city, Canada, June 8 2025
- *Factors impacting success in mathematics teaching and research*, Alberta Mathematics Dialogue, Calgary, Canada, May 1 2025
- *The cosine measure relative to a subspace*, 25th International Symposium on Mathematical Programming, Montreal, Canada, July 21 2024
- *Approximating Hessians*, SIAM Conference on Optimization, Seattle, United States, May 31 2023
- *A derivative-free trust-region algorithm using calculus rules to build the model function*, Derivative-Free Optimization: Linking Algorithms and Applications Workshop, Kelowna, Canada, July 18 2022
- *Gradient and Hessian approximations in derivative-free optimization*, SIAM Conference on Optimization, via Zoom, July 22 2021
- *Gradient and Hessian approximations in derivative-free optimization*, 31st European Conference on Operational Research, Athens, Greece, via Zoom, July 12 2021

SEMINARS

- *The quest for descent directions*, Seminars of the Department of Mathematics and Statistics, AUS, October 28, 2025
- *On positive spanning sets and cosine measure*, University of Calgary, March 27 2025

- *On positive spanning sets and cosine measure*, Colloquium of the Department of Mathematics and Statistics, University of Wyoming, March 7 2025
- *The cosine measure relative to a subspace*, Colloquium of the Mathematics and Computing Department, MRU, November 1 2024
- *The cosine measure relative to a subspace*, COCANA live seminar, UBC, October 17 2024
- *Bases positives et mesure cosinus*, Séminaire GERAD, Polytechnique Montréal, August 31 2022
- *Positive bases of intermediate sizes with maximal cosine measure*, COCANA live seminar, UBC, via Zoom, February 28 2022

SERVICE TO THE SCIENTIFIC COMMUNITY

- CO-organizer of a session titled *derivative-free optimization and simulation-based optimization* during the CMS Summer Meeting 2025 in Quebec City (June 6-June 9 2025)
- Speaker for the *Math Attack Summer Camp for Girls* at the University of Calgary (June 30 2025)

SERVICE TO THE AMERICAN UNIVERSITY OF SHARJAH

- Member of the MathFest 2026 Committee
- Member of the Budget and Finance Committee (September 2025-Present)
- Committee member for the 10th International Conference on Modeling, Simulation and Applied Optimization 2026 (ICMSAO)

SERVICE TO MOUNT ROYAL UNIVERSITY

- Coordinator for MATH 1200, Calculus I for Scientists (December 2024-April 2025)
- Member of the Awards Committee (November 2024-Present)
- Assistant to the Department Chair to develop new courses related to the Data Science Bachelor (October 2024-July 2025)
- Co-Organizer for the 27th Western Canadian Conference on Computing Education (September 2024-April 2025)
- Organizer for the Colloquium of the Mathematics and Computing Department (September 2024-July 2025)

SERVICE TO SAINT FRANCIS XAVIER UNIVERSITY

- Faculty representative on the President's Action Committee on Anti-Racism (PACAR) (October 2023-May 2024)
- Member of the Data Science Committee (October 2023-May 2024)

SERVICE TO THE UNIVERSITY OF BRITISH COLUMBIA

- Graduate Representative on the Okanagan Senate (May 2022-June 2023)
- Graduate Representative of the CMPS Department for the EDI Committee (September 2021-August 2023)
- External Coordinator for the Quantitative Sciences Course Union (QSCU) (October 2021-May 2022)
- COCANA Seminar Assistant Organizer (August 2020-April 2021)
- Graduate Representative for the QSCU (May 2020-April 2021)
- Graduate representative for the CMPS Department (September 2019-April 2020)

REFEREED PUBLICATIONS

NOTE: In mathematics, it is traditional that all authors are listed in alphabetical order. If authors are listed in alphabetical order, then it should be assumed that all authors contributed equally.

PUBLISHED

- 1) Jarry-Bolduc, G., Planiden, C., 2025. Using generalized simplex methods to approximate derivatives, *IMA Journal of Numerical Analysis*.
<https://doi.org/10.1093/imanum/draf053>
- 2) Audet, C., Hare, W., Jarry-Bolduc, G., 2025. The cosine measure relative to a subspace, *Computational Optimization and Applications*.
<https://doi.org/10.1007/s10589-025-00701-z>
- 3) Hare, W., Jarry-Bolduc, G., Kerleau, S., Royer, W., 2024, Using orthogonally structured positive bases for constructing positive k -spanning sets with cosine measure guarantees, *Linear Algebra Applications*, 680, p.183-207.
<https://doi.org/10.1016/j.laa.2023.10.006>
- 4) Hare, W., Jarry-Bolduc, G., Planiden, C., 2023, A matrix algebra approach to approximate Hessians, *IMA Journal of Numerical Analysis*, p.1-31.
<https://doi.org/10.1093/imanum/drad056>
- 5) Hare, W., Jarry-Bolduc, G., 2023, About the performance of a calculus-based approach to build model functions in a derivative-free trust-region algorithm, *Algorithms*, 16(2), 84.
<https://www.mdpi.com/2112496>
- 6) Hare, W., Jarry-Bolduc, G. and Planiden, C., 2023, Nicely structured positive bases with maximal cosine measure, *Optimization Letters*, p.1-21.
<https://doi.org/10.1007/s11590-023-01973-2>
- 7) Chen, Y., Hare W., Jarry-Bolduc, G. 2022. Error Analysis of Surrogate Models Constructed through Operations on Sub-models. *Mathematics of Operations Research*.
<https://doi.org/10.1287/moor.2022.1344>
- 8) Hare, W., Jarry-Bolduc, G. and Planiden, C., 2022. Limiting behaviour of the generalized simplex gradient as the number of points tends to infinity on a fixed shape in R^n . *Journal of Set-Valued and Variational Analysis*.
<https://doi.org/10.1007/s11228-023-00664-5>
- 9) Jarry-Bolduc, G., 2022. Approximating the diagonal of a Hessian: which sample set of points should be used. *Numerical Algorithms*, 91, p.1349-1361.
<https://doi.org/10.1007/s11075-022-01304-z>
- 10) Braun, P., Hare, W. and Jarry-Bolduc, G., 2021. Limiting behavior of derivative approximation techniques as the number of points tends to infinity on a fixed interval in R . *Journal of Computational and Applied Mathematics*, 386, Article 113218.
<https://doi.org/10.1016/j.cam.2020.113218>

- 11) Hare, W. and Jarry-Bolduc, G., 2020. A deterministic algorithm to compute the cosine measure of a finite positive spanning set. *Optimization Letters*, 14, p.1305-1316.
<https://doi.org/10.1007/s11590-020-01587-y>
- 12) Hare, W. Jarry-Bolduc, G., and Planiden, C., 2020. Error bounds for overdetermined and underdetermined generalized centred simplex gradients. *IMA Journal of Numerical Analysis*, 42, p.744-770.
<https://doi.org/10.1093/imanum/draa089>
- 13) Hare, W. and Jarry-Bolduc, G., 2020. Calculus identities for generalized simplex gradients: Rules and applications. *SIAM Journal on Optimization*, 30(1), p.853-884.
<https://doi.org/10.1093/imanum/draa089>
- 14) Jarry-Bolduc, G., Nadeau, P. and Singh, S., 2020. Uniform simplex of an arbitrary orientation. *Optimization Letters*, 14(6), p.1407-1417.
<https://doi.org/10.1007/s11590-019-01448-3>

SUBMITTED

- 1) Hare, W., Jarry-Bolduc, G., Planiden, C., 2026, The cosine measure of a function at a point, *Mathematics of Operations Research*.
- 2) Humeniuk, A., Jarry-Bolduc, G., Pascua P., Williams, N., An Algorithm to exactly compute minimal upper bounds in the Loewner order, *Linear Algebra and Its Applications*

STUDENTS SUPERVISED

FUNDED WITH NSERC DISCOVERY GRANT

- Joban Brar, undergraduate student at MRU, April 2025-August 2025
- Yanishka Gahlot, undergraduate student at MRU, April 2025-July 2025
- Gaurav Neupane, undergraduate student at MRU, April 2025-December 2025
- Patrick Pascua, undergraduate student at MRU, co-supervisor with Dr. Adam Humeniuk, April 2025-August 2025
- Nejaunie Williams, undergraduate student at MRU, co-supervisor with Dr. Adam Humeniuk, April 2025-August 2025

FUNDED WITH FACULTY RESEARCH GRANT

- Dana Abukhalaf, master's student at AUS, June 2026-
- Mariam Fadl El Mula, undergraduate student at AUS, June 2026-
- Ranem Elashal, undergraduate student at AUS, June 2026-
- Wissam Hakawati, doctoral student at AUS, August 2026-
- Joud Hamdan, master's student at AUS, June 2026-
- Syed Musab Kazim, undergraduate student at AUS, June 2026-
- Manish Krishan Lal, researcher at AUS, July 2026-
- Yassine Leduc, master's student at AUS, August 2026-
- Mohamad Turkmani, master's student at AUS, August 2026-