

# LUKE HAGAR

🌐 [lmhagar.github.io](https://lmhagar.github.io) ✉ [lmhagar@uwaterloo.ca](mailto:lmhagar@uwaterloo.ca)

## EDUCATION

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### University of Waterloo (UW)

Candidate for PhD in Statistics

*Sep 2021 – Aug 2024 (expected)*

- Thesis topic: Design with sampling distribution segments
- Supervisor: Dr. Nathaniel Stevens

MMath in Statistics

*Sep 2020 – Aug 2021*

BMath, Honours Mathematical Optimization & Statistics (Co-op)

*Sep 2015 – Apr 2020*

## SCHOLARSHIPS & AWARDS

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### Funding

- NSERC Postdoctoral Fellowship: \$90,000 (*2024-2026*)
- CRM StatLab - CANSSI Postdoctoral Fellowship: \$42,000 (Declined) (*2024-2025*)
- ASA Mary G. and Joseph Natrella Scholarship: \$3,500 (*2024*)
- NSERC Postgraduate Scholarship – Doctoral: \$63,000 (*2021-2024*)
- UW President's Graduate Scholarship: \$35,000 (*2021-2024*)
- UW Statistics & Actuarial Science Chair's Award: \$1,000  $\times$  7 (*2021-2024*)
- UW Statistics & Actuarial Science Sprott Scholarship: \$1,000 (*2023*)
- UW Statistics & Actuarial Science Teaching Assistant Award: \$500 (*2023*)
- UW Statistics & Actuarial Science Comprehensive Exam Award: \$1,000 (*2022*)
- Ontario Graduate Scholarship (Declined): \$15,000 (*2021-2022*)
- UW Statistics & Actuarial Science Doctoral Entrance Award: \$5,000 (*2021-2022*)
- UW Statistics & Actuarial Science Outstanding Academic Performance Award: \$1,000 (*2021*)
- NSERC Canada Graduate Scholarship – Master's: \$17,500 (*2020-2021*)
- UW President's Graduate Scholarship: \$10,000 (*2020-2021*)
- UW President's Scholarship of Distinction: \$5,000 (*2015-2020*)
- NSERC Undergraduate Student Research Award: \$4,500 (*2019*)
- Scott Kelsey Fevreau Memorial Award: \$500 (*2017*)
- St. Jerome's University Robert & Margaret Forwell Scholarship: \$1,500 (*2016*)

### Recognitions

- 2023 Presentation Award (Waterloo Student Conference in Statistics, Actuarial Science & Finance)
  - This award recognizes the best presentations at the UW Department of Statistics and Actuarial Science's annual regional student conference. The award is for *Presentation #8*.
- 2022 Best Presentation Award (UW Statistics & Actuarial Science Research Presentation Day)
- 2021 SSC Business and Industrial Statistics Section Presentation Award
  - This award recognizes the best student presentation related to business and industrial statistics at the Statistical Society of Canada's annual meeting. The award is for *Presentation #2*.

## PEER-REVIEWED PUBLICATIONS

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### Published & Accepted

3. W. Cichocki, S. Kaminskaïa, and **L. Hagar** (2023+). Regional variation in articulation rate in French spoken in Canada. *Journal of the International Phonetics Association*, in press.
2. N.T. Stevens and **L. Hagar** (2022). Comparative probability metrics: Using posterior probabilities to account for practical equivalence in A/B tests. *The American Statistician* 76(3), 224–237.
1. L. Lu, C.M. Anderson-Cook, N.T. Stevens, and **L. Hagar** (2022). Using a baseline with the probability of agreement to compare distribution characteristics. *Quality Engineering* 34(3), 322–343.

### Submitted for Publication

5. **L. Hagar** and N.T. Stevens. (2024+). Scalable design with posterior-based operating characteristics. Revision invited by *Journal of the American Statistical Association*, May 2024. [arXiv](#).
4. **L. Hagar** and N.T. Stevens. (2024+). Bioequivalence design with sampling distribution segments. Submitted to *Statistics in Medicine*, April 2024. [arXiv](#).
3. **L. Hagar** and N.T. Stevens. (2024+). Posterior ramifications of prior dependence structures. Revision submitted to *Statistical Science*, March 2024. [arXiv](#).
2. A. Deng, **L. Hagar**, N.T. Stevens, T. Xifara, A.K. Gandhi (2024+) Metric decomposition in A/B tests. Submitted to *ACM Knowledge Discovery and Data Mining*.
1. **L. Hagar** and N.T. Stevens. (2023+). Fast power curve approximation for posterior analyses. Revision submitted to *Bayesian Analysis*, October 2023. [arXiv](#).

## OTHER PUBLICATIONS

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### Conference Proceedings

1. W. Cichocki, **L. Hagar**, and Y. Perreault (2023). Variation in articulation rate in New Brunswick French. *Canadian Acoustics* 51(3), 200–201.

## PRESENTATIONS

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### Invited Seminars and Conference Presentations

4. *Scalable Design with Posterior-Based Operating Characteristics*
  - Joint Research Conference, June 2024
3. *A Bayesian Approach to Experimentation*
  - Airbnb AirAcademy Webinar Series, November 2023
2. *Targeted Sampling for Scalable Experimental Design*
  - American Society for Quality (ASQ) CPID Webinar, November 2023
1. *Using a Baseline with the Probability of Agreement to Compare Distribution Characteristics*
  - INFORMS Conference on Quality, Statistics, and Reliability, June 2023

### Contributed Conference Presentations

10. *Quantile Estimation for Sampling Distributions of Posterior Probabilities*
  - Statistical Society of Canada Annual Meeting, June 2024
9. *Engaging Assessments with Real Data Analysis in Undergraduate Statistics Courses*
  - University of Waterloo Teaching and Learning Conference, May 2024
8. *Scalable Power Curve Approximation with Targeted Hypercube Sampling*
  - Waterloo Student Conference in Statistics, Actuarial Science & Finance, October 2023

7. *Fast Sample Size Determination for Bayesian Equivalence Tests*
  - Joint Statistical Meetings, August 2023
6. *Fast Sample Size Determination for Two-Group Equivalence Tests with Unequal Variances*
  - International Society for Business and Industrial Statistics Conference, July 2023
5. *Fast Sample Size Determination for Two-Group Equivalence Tests with Unequal Variances*
  - Statistical Society of Canada Annual Meeting, May 2023
4. *Fast Sample Size Determination for Bayesian Equivalence Tests*
  - University of Toronto's Statistics Graduate Student Research Day, April 2023
3. *A More Computationally Tractable Approach to Bayesian Interval-Based Sample Size Determination*
  - Statistical Society of Canada Annual Meeting, May 2022
2. *A Framework for Sample Size Determination with Comparative Probability Metrics (CPMs)*
  - Statistical Society of Canada Annual Meeting, June 2021
1. *A More Comprehensive Framework for Binary Response Experiments Using CPMs*
  - Ninth Annual Canadian Statistics Student Conference, June 2021

## EXPERIENCE

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### Teaching Experience

Sessional Lecturer, University of Waterloo *Jan 2024 – Apr 2024*

- Course: STAT 341 (Computational Statistics & Data Analysis) with 125 students

Teaching Assistant, University of Waterloo *Jan 2017 – Aug 2023*

- Courses: STAT 938 (Statistical Consulting), STAT 341 (Computational Statistics & Data Analysis), STAT 430 (Experimental Design), STAT 443 (Forecasting), COMM 421 (Financial Statement Analysis), MATH 137 (Calculus I), and MATH 138 (Calculus II)

Professional Development Programs, University of Waterloo

- Fundamentals of University Teaching (*2021*), University Mathematics Teaching Techniques (*2023*), Certificate in University Teaching (*2022 – 2023*), New Instructor Foundations Program (*2023*)

### Work Experience

TA Workshop Facilitator, UW Centre for Teaching Excellence *Jan 2023 – Apr 2024*

- Facilitating and developing interdisciplinary teaching workshops for graduate students.

TA Coordinator, UW Department of Statistics & Actuarial Science *Sep 2023 – Dec 2023*

- Co-developed practicum component for final stage of teaching assistant development program.
- Conducted teaching observations to provide TAs with constructive feedback.

Consultant, UW Statistical Consulting & Survey Research Unit *Jan 2022 – Apr 2023*

- Guided students and faculty members on how to leverage sound statistical approaches in their analyses, with active research collaboration in enhanced service projects (see e.g., *Paper #3*).

## STATISTICAL SERVICE

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SSC Student and Recent Graduate Committee

- Chair (*July 2023 – present*)
  - Leading a team of 10 members to host community-building and professional events for statistics students and recent graduates in Canada
- Member (*July 2022 – June 2023*)

#### SSC Canadian Student Statistics Conference

- ▶ Co-chair (*July 2022 – June 2023*)
  - ▶ Co-supervised a committee of 15 students to organize a national conference at Carleton University with 170 participants
- ▶ Scientific Program Co-coordinator (*Sep 2021 – June 2022*)

#### ASQ Chemical and Process Industries Division (CPID) Leadership Team

- ▶ Secretary/Treasurer (*Jan 2024 – present*)
- ▶ Fall Technical Conference Publicity Chair (*Jan 2023 – present*)

#### UW Statistical Workshops and Applications Group

- ▶ Executive Team Member (*Jun 2022 – Aug 2023*)

#### UW Math Faculty Graduate Studies Committee

- ▶ Elected Graduate Student Representative (*May 2021 – Aug 2023*)

#### UW Math Faculty-Level Student Course Perceptions Working Group

- ▶ Graduate Student Representative (*Mar 2022 – Mar 2023*)

### EDITORIAL ACTIVITIES

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#### Reviewer

- ▶ *Computational Statistics, Statistical Methods in Medical Research*