

LUKE HAGAR

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| CONTACT INFORMATION | Department of Epidemiology, Biostatistics & Occupational Health, McGill University 2001 McGill College Ave, Desk 1206 | Email: luke.hagar@mail.mcgill.ca Website: lmhagar.github.io ORCID: 0000-0002-1093-9463 |
| RESEARCH INTERESTS | Experimental Design, Sampling Techniques, Hypothesis Testing, Bayesian Methods, Computational Inference | |
| CURRENT POSITION | Postdoctoral Scholar (09/2024 – present) McGill University , Department of Epidemiology, Biostatistics & Occupational Health, Montréal, Canada (Advisor: Shirin Golchi) | |
| EDUCATION | University of Waterloo , Waterloo, Canada PhD in Statistics , Department of Statistics & Actuarial Science (09/2021 – 08/2024) <ul style="list-style-type: none">• Thesis: <i>Design with Sampling Distribution Segments</i>• Advisor: Nathaniel Stevens MMATH in Statistics , Department of Statistics & Actuarial Science (09/2020 – 08/2021) BMATH in Mathematical Optimization & Statistics (Co-op) , Faculty of Mathematics (09/2015 – 04/2020) | |
| PEER-REVIEWED PUBLICATIONS | Published & Accepted <ol style="list-style-type: none">5. L. Hagar and N.T. Stevens. (2024+). Fast power curve approximation for posterior analyses. Accepted to <i>Bayesian Analysis</i>. arXiv.4. A. Deng, L. Hagar, N.T. Stevens, T. Xifara, A.K. Gandhi. (2024). Metric decomposition in A/B tests. In <i>Proceedings of the 30th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining</i>, 4885–4895.3. W. Cichocki, S. Kaminskaïa, and L. Hagar. (2024). Regional variation in articulation rate in French spoken in Canada. <i>Journal of the International Phonetics Association</i> 54(1), 126–145.2. N.T. Stevens and L. Hagar. (2022). Comparative probability metrics: Using posterior probabilities to account for practical equivalence in A/B tests. <i>The American Statistician</i> 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. <i>Quality Engineering</i> 34(3), 322–343. Submitted for Publication <ol style="list-style-type: none">3. L. Hagar and N.T. Stevens. (2024+). Scalable design with posterior-based operating characteristics. Revision invited by <i>Journal of the American Statistical Association</i>, 05/2024. arXiv.2. L. Hagar and N.T. Stevens. (2024+). Bioequivalence design with sampling distribution segments. Submitted to <i>Statistics in Medicine</i>, 04/2024. arXiv.1. L. Hagar and N.T. Stevens. (2024+). Posterior ramifications of prior dependence structures. Revision submitted to <i>Statistical Science</i>, 03/2024. arXiv. | |
| OTHER PUBLICATIONS | Conference Proceedings <ol style="list-style-type: none">1. W. Cichocki, L. Hagar, and Y. Perreault. (2023). Variation in articulation rate in New Brunswick French. <i>Canadian Acoustics</i> 51(3), 200–201. | |

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| RESEARCH FUNDING | \$140,000 | NSERC Postdoctoral Fellowship (2024 – 2026) |
| | \$42,000 | CRM StatLab - CANSSI Postdoctoral Fellowship (Declined, 2024 – 2025) |
| | \$63,000 | NSERC Postgraduate Scholarship – Doctoral (2021 – 2024) |
| | \$15,000 | Ontario Graduate Scholarship (Declined, 2021 – 2022) |
| | \$17,500 | NSERC Canada Graduate Scholarship – Master’s (2020 – 2021) |
| | \$4,500 | NSERC Undergraduate Student Research Award (2019) |
| SCHOLARSHIPS & AWARDS | \$7,500 | ASQ Ellis R. Ott Scholarship for Applied Statistics & Quality (2024) |
| | \$3,500 | ASA Mary G. and Joseph Natrella Scholarship (2024) |
| | \$45,000 | UW President’s Graduate Scholarship (2020 – 2024) |
| | \$1,000 | UW SAS Chair’s Award (2021 – 2024, × 5) |
| | \$1,000 | UW SAS Sprott Scholarship (2023) |
| | \$500 | UW SAS Teaching Assistant Award (2023) |
| | \$1,000 | UW SAS Comprehensive Exam Award (2022) |
| | \$5,000 | UW SAS Doctoral Entrance Award (2021 – 2022) |
| | \$1,000 | UW SAS Outstanding Academic Performance Award (2021) |
| | \$5,000 | UW President’s Scholarship of Distinction (2015 – 2020) |
| | \$500 | UW Scott Kelsey Fevreau Memorial Award (2017) |
| | \$1,500 | St. Jerome’s University Robert & Margaret Forwell Scholarship (2016) |
| PRESENTATIONS | Invited Seminars and Conference Presentations | |
| | <ol style="list-style-type: none"> 6. [Upcoming] <i>Design of Posterior Analyses with Sampling Distribution Segments</i>. Computational and Methodological (CM)Statistics, 12/2024. 5. [Upcoming] <i>Scalable Bayesian Design for Business Innovation</i>. HEC Montréal, 11/2024. 4. <i>Scalable Design with Posterior-Based Operating Characteristics</i>. Joint Research Conference, 06/2024. 3. <i>A Bayesian Approach to Experimentation</i>. Airbnb AirAcademy Webinar Series, 11/2023. 2. <i>Targeted Sampling for Scalable Experimental Design</i>. ASQ CPID Webinar, 11/2023. 1. <i>Using a Baseline with the Probability of Agreement to Compare Distribution Characteristics</i>. INFORMS Conference on Quality, Statistics, and Reliability, 06/2023. | |
| | Contributed Conference Presentations | |
| | <ol style="list-style-type: none"> 12. <i>A Complex Approach to Minority French Rhythm</i>. LACUS Conference, 07/2024. 11. <i>The Relationship between Articulation Rate and Utterance Length in Canadian French: Data from Reading Style</i>. LACUS Conference, 07/2024. 10. <i>Quantile Estimation for Sampling Distributions of Posterior Probabilities</i>. SSC Annual Meeting, 06/2024. <ul style="list-style-type: none"> • Biostatistics Section Student Presentation Award Winner 9. <i>Engaging Assessments with Real Data Analysis in Undergraduate Statistics Courses</i>. UW Teaching and Learning Conference, 05/2024. 8. <i>Scalable Power Curve Approximation with Targeted Hypercube Sampling</i>. Waterloo Student Conference in Statistics, Actuarial Science & Finance, 10/2023. <ul style="list-style-type: none"> • Presentation Award Winner 7. <i>Fast Sample Size Determination for Bayesian Equivalence Tests</i>. Joint Statistical Meetings, 08/2023. 6. <i>Fast Sample Size Determination for Two-Group Equivalence Tests with Unequal Variances</i>. ISBIS Conference, 07/2023. | |

5. *Fast Sample Size Determination for Two-Group Equivalence Tests with Unequal Variances*. SSC Annual Meeting, 05/2023.
4. *Fast Sample Size Determination for Bayesian Equivalence Tests*. University of Toronto Statistics Graduate Student Research Day, 04/2023.
3. *A More Computationally Tractable Approach to Bayesian Interval-Based Sample Size Determination*. SSC Annual Meeting, 05/2022.
2. *A Framework for Sample Size Determination with Comparative Probability Metrics*. SSC Annual Meeting, 06/2021.
 - Business & Industrial Statistics Section Student Presentation Award Winner
1. *A More Comprehensive Framework for Binary Response Experiments Using Comparative Probability Metrics*. Canadian Statistics Student Conference, 06/2021.

RESEARCH EXPERIENCE

Academic Collaborator, Airbnb (09/2023 – 08/2024)

- Navigated changing priorities to develop methods now applied at Airbnb (see *Paper #4*), leading to an invited talk for Airbnb executives and data scientists.

Consultant, UW Statistical Consulting & Survey Research Unit (01/2022 – 04/2023)

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

TEACHING EXPERIENCE

McGill University, Montréal, Canada

Course Lecturer (08/2024 – 12/2024)

- **BIOS 612**: Advanced Generalized Linear Models with 12 graduate students. Co-instructed with Shirin Golchi.

University of Waterloo, Waterloo, Canada

Sessional Lecturer (01/2024 – 04/2024)

- **STAT 341**: Computational Statistics & Data Analysis with 125 undergraduates. Coordinated two sections with 250 students and managed 6 teaching assistants.

TA Workshop Facilitator (01/2023 – 04/2024)

- Facilitated and developed interdisciplinary teaching workshops for graduate students with UW's Centre for Teaching Excellence.

TA Coordinator (09/2023 – 12/2023)

- Co-developed a practicum component of the teaching assistant development program for the SAS department and conducted teaching observations for TAs.

Teaching Assistant (01/2017 – 08/2023)

- STAT 938: Statistical Consulting (Spring 2023)
- STAT 430: Experimental Design (Spring 2021)
- STAT 341: Computational Statistics & Data Analysis (Winter 2021)
- COMM 421: Financial Statement Analysis (Winter 2021)
- STAT 443: Forecasting (Fall 2020)
- MATH 137: Calculus I (Fall 2017)
- MATH 138: Calculus II (Winter 2017)

PROFESSIONAL DEVELOPMENT

Certificates

- UW Certificate in University Teaching (2022 – 2023)
- UW New Instructor Foundations Program (2023)

SERVICE PROFILE

- UW University Mathematics Teaching Techniques (2023)
- UW Fundamentals of University Teaching (2021)

External Roles

ASQ CPID Leadership Team

- Secretary/Treasurer (01/2024 – present)
- Fall Technical Conference Publicity Chair (01/2023 – present)

SSC Student and Recent Graduate Committee

- Past Chair (07/2024 – present)
- Chair (07/2023 – 06/2024)
 - Led a team of 10 members to host community-building and professional events for statistics students and recent graduates in Canada.
- Member (07/2022 – 06/2023)

SSC Canadian Student Statistics Conference

- Judge (03/2024 – 06/2024)
- Co-chair (07/2022 – 06/2023)
 - Co-supervised a committee of 15 students to organize a national conference at Carleton University with 170 participants.
- Scientific Program Co-coordinator (09/2021 – 06/2022)

Internal Roles

UW Statistical Workshops and Applications Group

- Executive Team Member (06/2022 – 08/2023)

UW Math Faculty Graduate Studies Committee

- Elected Graduate Student Representative (05/2021 – 08/2023)

UW Math Faculty-Level Student Course Perceptions Working Group

- Graduate Student Representative (03/2022 – 03/2023)

St. Jerome's University Student Leadership Team

- Peer Academic Leader (09/2015 – 04/2017)

EDITORIAL ACTIVITIES

Reviewer

- *Computational Statistics* (x2), *Statistical Methods in Medical Research*, *The American Statistician*

ACRONYMS

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| ASA | American Statistical Association |
| ASQ | American Society for Quality |
| CANSSI | Canadian Statistical Sciences Institute |
| CPID | Chemical and Process Industries Division |
| CRM | Centre de recherches mathématiques |
| INFORMS | Institute for Operations Research and the Management Sciences |
| ISBIS | International Society for Business and Industrial Statistics |
| LACUS | Linguistic Association of Canada and the United States |
| NSERC | Natural Sciences and Engineering Research Council |
| SAS | Statistics & Actuarial Science |
| SSC | Statistical Society of Canada |
| UW | University of Waterloo |