# Bailey Kacsmar

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## Research Interests

Privacy, Private Computation, Human Centered Privacy Technologies

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## Academic Background

Post-Secondary Education

- **PhD, University of Waterloo** — Waterloo, Ontario  
  *in Computer Science* — *2018 - Present*
    - Supervisor: Florian Kerschbaum
    - Thesis: Perceptions and Practicalities for Private Machine Learning

- **MMath, University of Waterloo** — Waterloo, Ontario  
  *in Computer Science* — *2016 - 2018*
    - Supervisor: Doug Stinson
    - Thesis: Designing Efficient Algorithms for Combinatorial Repairable Threshold Schemes

- **BSc (Honours), Brandon University** — Brandon, Manitoba  
  *Majors in Computer Science and Philosophy, Minor in Mathematics* — *2011 - 2016*
    - Graduated with "Greatest Distinction"
    - "Silver Medal in Philosophy" for highest GPA among philosophy majors

Co-Curricular Professional Development

- **Certificate in University Teaching** — Waterloo, Ontario  
  *Through the University of Waterloo's Centre for Teaching Excellence* — *2021*
- **Certificate in Student Leadership** — Waterloo, Ontario  
  *Through the University of Waterloo's Student Success Office* — *2018*
- **Certificate in Fundamentals of University Teaching** — Waterloo, Ontario  
  *Through the University of Waterloo's Centre for Teaching Excellence* — *2017*

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## Publications and Research Talks

Peer-Reviewed Publications

- **Bailey Kacsmar**. Improving Interactive Instruction: Faculty Engagement Requires Starting Small and Telling All. Accepted. To appear at Koli Calling, 22nd International Conference on Computing Education Research. November 2022.

- **Bailey Kacsmar**, Kyle Tilbury, Miti Mazmudar, Florian Kerschbaum. Caring about Sharing: User Perceptions of Multiparty Data Sharing. The 31st USENIX Security Symposium (USENIX Security 2022). Accepted.

- **Bailey Kacsmar**, Chelsea H. Komlo, Florian Kerschbaum, Ian Goldberg. (2020). Mind the Gap: Ceremonies for Applied Secret Sharing. Proceedings on Privacy Enhancing Technologies, 2020(2), pages 397-415.

- Rasoul Akhavan Mahdavi, Thomas Humphries, **Bailey Kacsmar**, Simeon Krastnikov, Nils Lukas, John Premkumar, Masoumeh Shafieinejad, Simon Oya, Florian Kerschbaum, Erik-Oliver Blass. Practical Over-Threshold Multi-Party Private Set Intersection. Annual Computer Security Applications Conference (ACSAC 2020), pages 772-783.

- **Bailey Kacsmar**, Basit Khurram, Nils Lukas, Alexander Norton, Masoumeh Shafieinejad, Zhiwei Shang, Yasser Baseri, Maryam Sepehri, Simon Oya, and Florian Kerschbaum. Differentially Private Two-Party Set Operations. The 5th IEEE European Symposium on Security and Privacy 2020. (Euro S&P), pages 390-404.

- **Bailey Kacsmar** and Douglas R. Stinson. A Network Reliability Approach to the Analysis of Combinatorial Repairable Threshold Schemes. Advances in Mathematics of Communications, 13-4 (2019), pages 601-612.

- Chenkuan Li, Changpin Li, **Bailey Kacsmar**, Roque Lacroix and Kyle Tilbury. The Abel integral equations in distribution, Advances in Analysis, 2 (2017), pages 88-104.

- **Bailey Kacsmar**, Sarah Plosker, Ryan Henry. Computing Low-Weight Discrete Logarithms, The 24th Annual Conference on Selected Areas in Cryptography (SAC 2017), Volume 10719 of LNCS, pages 106-126.

Conference Presentations without Proceedings

- "State-Level Secrets: When Theory Meets Practice for Journalists Working with Encrypted Documents", Real World Crypto 2019, San Jose, California, United States. (January 2019). Co-presenter: Chelsea Komlo

Poster Presentations and Extended Abstracts

- **Bailey Kacsmar**, Kyle Tilbury, Miti Mazmudar, Florian Kerschbaum. Caring about Sharing: User Perceptions of Multiparty Data Sharing. SOUPS 2022, Boston, Massachusetts.

- **Bailey Kacsmar**, Sarah Plosker, Ryan Henry *Computing Low-Weight Discrete Logarithms*, Second Annual Canadian Celebration of Women in Computing (2017), Montreal, Quebec

- Ryan Henry, **Bailey Kacsmar**, and Sarah Plosker: Computing Low-Weight Discrete Logarithms. Extended abstract at the 1st International Workshop on Mathematical Methods for Cryptography (MMC 2017), Svolvær-Lofoten, Norway (September 2017).

Other Research Experience

- The 2018 Program for Women and Mathematics: Mathematics of Modern Cryptography, Institute for Advanced Study, Princeton, New Jersey, May 19-26, 2018.

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## Honours & Awards

Cybersecurity and Privacy Excellence Graduate Scholarship ($10,000), CPI . . . . . . . . . . . . . 2022
PETs Travel Stipend ($3,210), Privacy Enhancing Technology Symposium . . . . . . . . . . . . . 2022
Alexander Graham Bell Canada Graduate Scholarship (CGS-D$_3$) ($105,000), NSERC . . . . 2019-2022
President's Graduate Scholarship ($30,000), University of Waterloo . . . . . . . . . . . . . . 2019-2022
David R. Cheriton Graduate Scholarship ($20,000), University of Waterloo . . . . . . . . . . 2018-2019
Provost Doctoral Entrance Award for Women ($5,000), University of Waterloo . . . . . . . . . . . 2018
SAC Travel Stipend ($527), Selected Areas of Cryptography Conference . . . . . . . . . . . . . . 2017
University of Waterloo Entrance Scholarship ($4,000), University of Waterloo . . . . . . . . . . . 2016

Karl Popper Scholarship in Philosophy ($1,985), Brandon University . . . . . . . . . . . . . . . 2016
Queen Elizabeth II Scholarship (~~$10,800~~) , University of Calgary . . . . . . . . . . . . . . . . . . 2016
Inducted into the Brandon University Honour Society, Brandon University . . . . . . . . . . . . 2015
Placed on the Dean's Honour List, Brandon University . . . . . . . . . . . . . . . . . . . . . . . . 2015
President's Leadership Scholarship (Full Tuition: $3,152.94), Brandon University . . . . . . . . 2015
Harold Vidal Memorial Scholarships in the Humanities ($1,500), Brandon University . . . . 2014,2015
R. Murray Simmons Scholarship in Humanities ($575), Brandon University . . . . . . . . . . . . 2015
Placed on the Honours List, Brandon University, Brandon University . . . . . . 2011, 2012, 2013, 2014
Brandon College Class of '50 Millennium Scholarship ($600), Brandon University . . . . . . . . . . 2013
Dr. W.N Hargreaves-Mawdsley Third Year Scholarship ($500), Brandon University . . . . . . . 2013
John Odin Scholarship, Brandon University ($770) . . . . . . . . . . . . . . . . . . . . . . . . . . 2013
Adam Sus Bursary in Computer Science ($2,450), Brandon University . . . . . . . . . . . . . . . 2012
Inducted into the Presidents Honour Society, Brandon University . . . . . . . . . . . . . . 2011, 2013
Brandon University Board of Governors Entrance Scholarship ($1,400), Brandon University . . . 2011

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## Academic Service

### Program Committee

- Privacy Enhancing Technologies Symposium (PoPETs) 2023

### Co-Chair (Artifact Committee):

- Privacy Enhancing Technologies Symposium (PoPETs) 2022, 2023

### Invited/External Reviewer:

- Privacy Enhancing Technologies Symposium (PoPETs) 2021, 2022

- Journal of Privacy and Confidentiality (JPC), 2022

- Innovation and Technology in Computer Science Education (ACM ITiCSE), 2022

### Artifact Committee:

- Privacy Enhancing Technologies Symposium (PoPETs) 2021

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## Teaching Experience

**Sessional Instructor**                                                      Waterloo, Ontario
*University of Waterloo*                                                                    *2023*
- Privacy, Cryptography, Network and Data Security (Winter '23)

**Teaching Assistant**                                                        Waterloo, Ontario
*University of Waterloo*                                                              *2016 - 2021*
- Information Systems Management (Winter '17, Winter '21)

- Computer Security and Privacy (Spring '17, Fall '17, Winter '18, Spring '18, Fall '18, Winter '20)

- Designing Functional Programs (Fall '16)

**Guest Lecturer**                                                            Waterloo, Ontario
*University of Waterloo*                                                               *2017, 2021*
- Computer Security and Privacy (Winter '21)
  Lecture Topic: Ethics

- Computer Security and Privacy (Winter '21)
  Lecture Topic: Address Resolution Protocol (ARP) Cache Posinoing Attacks

- Information Systems Management (Winter '17)
  Lecture Topic: Introduction to Business Process Improvement Methodologies

**Teaching Assistant**                                         Brandon, Manitoba
*Brandon University*                                               *2013 - 2016*

- Discrete Structures and Programming (Winter '15, Fall '15, Winter '16)

- Critical Thinking (Winter '16)

- Linear Algebra (Winter '13, Fall '13, Winter '14, Fall '14, Winter '15, Fall '15, Winter '16)

- Introduction to Logic (Fall '14, Fall '15)

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### Community Service and Outreach

**Youth Outreach**
*Focus on technology and entrepreneurial skills*

- **Technovation Girls Waterloo**                              Waterloo, Ontario
  *Volunteer and coding coach throughout the season*        *2018, 2019, 2020, 2022*

- **Girls Mean Business**                                      Waterloo, Ontario
  *Co-facilitator with Miti Mazmudar, online workshop on Network Security*        *2020*

- **CEMC Workshop in Computer Science for Young Women**        Waterloo, Ontario
  *Co-facilitator with Miti Mazmudar, session on Network Privacy and Security*        *2019*

- **Volunteer at GIRLsmarts4tech**                            Waterloo, Ontario
  *Assist participants following the tutorial in MIT App Inventor*        *2018*

- **Guest Presenter, Cryptography, Security, and Privacy**    Waterloo, Ontario
  *For the Junior Achievement in the Waterloo Region Advanced Camp*        *2017*

**Undergraduate Outreach**
*Industry and Academia*

- **Mentor at Ladies Who L(a)unch**                           Waterloo, Ontario
  *Speed networking luncheon presented by Women in Math (WiM) Committee*        *2019*

- **Mentor for StarCon Software Engineering Conference**      Waterloo, Ontario
  *Provide feedback and advice to first time presenters preparing their talks*        *2017*

- **Mentor, Women in Computer Science (WICS) Speed Mentoring**    Waterloo, Ontario
  *A mentoring event for undergraduate women in computer science*        *2017*

- **Mentor, Women in Computer Science (WICS) Dinner with the Profs** Waterloo, Ontario
  *An opportunity for undergraduates to speak with professors and graduate students*        *2017*
  *in a casual setting*