

Cait Harrigan, MSc.

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I am a graduate student at the University of Toronto supervised by [Quaid Morris](#) and [Kieran Campbell](#). I'm a graduate researcher at the [Vector Institute](#) and Doctoral Fellow at the [UofT Data Sciences Institute](#). I use machine learning to understand cancer genomics by modelling the evolutionary constraints that underlie how mutations occur in DNA. I'm passionate about open science, and promoting great mentorship in the sciences.

EDUCATION

- 01/21 - present **PhD in Computer Science**
University of Toronto
Supervised by Quaid Morris and Kieran Campbell
- 09/19 - 03/21 **MSc. in Computer Science**
University of Toronto
Supervised by Quaid Morris
- 09/15 - 06/19 **BSc. in Computational Biology**
University of Toronto
Awarded with distinction

RESEARCH EXPERIENCE

- 06/23 - present **Visiting Graduate Researcher**
Memorial Sloan Kettering Cancer Center
Hosted by Quaid Morris
- 05/21 - 09/21 **Visiting Graduate Researcher**
Memorial Sloan Kettering Cancer Center
Hosted by Quaid Morris
- 05/17 - 09/17 **Undergraduate Research Assistant**
SickKids Hospital
Supervised by Michael Wilson and Anna Goldenberg

PEER REVIEWED PUBLICATIONS

1. Caitlin Timmons, Quaid Morris, and **Caitlin F. Harrigan**. "[Regional mutational signature activities in cancer genomes](#)". En. In: *PLOS Computational Biology* 18.12 (Dec. 2022), p. e1010733.
2. Agata A. Bielska, **Caitlin F. Harrigan**, Yeon Ju Kyung, Quaid Morris, Wilhelm Palm, and Craig B. Thompson. "Activating mTOR mutations are detrimental in nutrient-poor conditions". Eng. In: *Cancer Research* (Jul. 2022).
3. **Caitlin F. Harrigan**, Yulia Rubanova, Quaid Morris, and Alina Selega. "[TrackSigFreq : subclonal reconstructions based on mutation signatures and allele frequencies](#)". In: *Pacific Symposium on Biocomputing* 25 (Jan. 2020), pp. 238-249.
4. Yulia Rubanova, Ruian Shi, **Caitlin F. Harrigan**, Roujia Li, Jeff Wintersinger, Nil Sahin, Amit Deshwar, and Quaid Morris. "[Reconstructing evolutionary trajectories of mutation signature activities in cancer using TrackSig](#)". In: *Nature Communications* 11.1 (Feb. 2020), pp. 1-12.

OTHER PUBLICATIONS

1. **Caitlin F. Harrigan***, Gabriella Morgenshtern*, Anna Goldenberg, and Fanny Chevalier. “[Considerations for Visualizing Uncertainty in Clinical Machine Learning Models](#)”. Realizing AI in Healthcare: Challenges Appearing in the Wild, Workshop at CHI 2021 Online Virtual Conference, May. 2021.

POSTERS

- 04/23 **Dirichlet allocation of mutations to model DDR in cancer**
Toronto DNA Damage & Repair Symposium
- 07/22 **Dirichlet Allocation of Mutations Captures the Action of DNA Damage and Misrepair Processes**
Intelligent Systems for Molecular Biology
- 11/21 **Dirichlet Allocation of Mutations in Cancer Genomes**
Machine Learning in Computational Biology
- 04/21 **Tandem Signatures of DNA Damage and Misrepair in Cancer**
Computing Research Association’s Grad Cohort for Women
- 12/19 **TrackSigFreq: subclonal reconstructions based on mutation signatures and allele frequencies**
Machine Learning in Computational Biology

HONOURS & AWARDS

- 03/20 - present **Vector Institute Research Grant**
Vector Institute, Toronto, Canada
- 09/22 - present **NSERC Postgraduate Scholarship - Doctoral**
University of Toronto
- 09/22 - present **DSI Doctoral Student Fellowship Award**
Data Science Institute, University of Toronto
- 07/22 **Queen Elizabeth II Graduate Scholarship in Science & Technology**
(respectfully declined)
- 09/21 - 09/22 **Ontario Graduate Scholarship**
Department of Computer Science, University of Toronto
- 07/20 - 07/22 **ACM SIGHPC Computational & Data Science Fellowship**
Special Interest Group on High Performance Computing of the Association for Computing Machinery
- 11/19 - 04/22 **Faculty of Arts and Science Program Level Fellowship**
Department of Computer Science, University of Toronto
- 08/21 **JXTX foundation Genome Informatics Scholarship**
James P. Taylor Foundation for Open Science
- 09/20 **General Motors Women in Science and Mathematics Award**
University of Toronto
- 11/19 **NIH Conference Travel Fellowship**
International Society for Computational Biology
- 07/17 **The Audrey Taylor Award**
New College, University of Toronto

ACADEMIC TALKS

- 05/23 **Mutational Signatures for DNA Damage and Misrepair**
Mathematical Methods in Cancer Biology, Evolution and Therapy (BIRS 23w5084)
Invited talk
- 11/21 **DAMUTA: Dirichlet allocation of mutations as a function of both damage and DNA repair**
Cold Spring Harbour Laboratory Meeting: Genome Informatics
Selected Talk
- 01/20 **TrackSigFreq: subclonal reconstructions based on mutation signatures and allele frequencies**
Pacific Symposium on Biocomputing
Selected Talk, Poster

GUEST LECTURES

- 03/23 **Exploring & Explaining Data in the Wild**
AI & Data Science Post-Graduate Program, Loyalist College
Invited by Prof. Peter Papadakos
- 02/22 **Data Collection & Analysis**
PRISM research & mentorship program, University of Toronto
Invited by Prof. Sadia Sharmin
- 01/20 **Environmental & Life Sciences Workshop Series**
STEMHub Foundation
Invited workshop series
- 01/20 **R for bioinformatics**
Global Society for Genetics and Genome Biology
Invited workshop

OTHER TALKS

- 10/22 **Finding the 'I' in science**
ACM Canadian Celebration of Women in Computing
Selected Workshop
- 02/20 **Undergraduate research opportunities: how to find them and make them work for you**
UofT Bioinformatics and Computational Biology Student Union
Invited by the BCBSU
- 05/19 **How to hack your degree**
Computer Science Student Union, University of Toronto
Invited by the CSSU

SERVICE

Peer review: Genome Biology, iScience, Genome Medicine

Conference program committee: Machine Learning in Computational Biology (2019), Pacific Symposium on Biocomputing (2020)

RESEARCH MENTORSHIP

- 09/22 - 12/22 **Fedir Zhydok**
Undergraduate Student, National University of Kyiv-Mohyla Academy
Topic: Identifying metastatic tumours from mutational signatures
- 05/21 - 08/22 **Caitlin Timmons**
Undergraduate Student, Memorial Sloan Kettering Cancer Center
Topic: Modelling spatial distribution of mutational signatures in cancer genomes.
- 05/20 - 11/20 **Haritha Lakshmanan**
Highschool Student, Memorial Sloan Kettering Cancer Center
Topic: Automatic discovery of mutations predictive of survival in breast cancer patients

PROGAM ADMINISTRATION

- 09/21 **Program Organizer**
UofT Graduate Application Assistance Program
- 10/20 - 05/21 **Project Manager**
STEMHub Foundation
- 05/18 - 05/19 **Founder and treasurer**
Bioinformatics and Computational Biology Student Union, University of Toronto
- 09/16 - 05/17 **Communications and Marketing Executive**
UofT Women in Computer Science (WiCS), University of Toronto

TEACHING ASSISTANT POSITIONS

Unless otherwise noted, school is University of Toronto

- 01/23 - 05/23 **JSC370: Data Science II**
- 01/23 - 05/23 **JSC270: Data Science I**
- 09/22 - 12/22 **STA313: Data Visualization**
- 01/22 - 05/22 **PRISM: Preparation for Research through Immersion, Skills, and Mentorship**
- 01/22 - 05/22 **JSC370: Data Science II**
- 09/21 - 12/21 **CSC197: Privacy in the Age of Big Data Collection**
- 01/21 - 05/21 **STA4273: Minimizing Expectations**
- 09/20 - 12/20 **CSC197: Privacy in the Age of Big Data Collection**
- 01/20 - 05/20 **JSC270: Data Science I**
- 09/19 - 12/19 **CSC373: Algorithm Design, Analysis & Complexity**

MENTORSHIP

As part of my ongoing commitment to supporting students at all levels and background in engaging with computational biology, I make an effort to be available to provide guidance and resources to students, with a particular focus on creating an inclusive environment that fosters diverse perspectives and experiences. In addition to being a mentor through the organized programs listed here, I set aside ~2h/month for by-request 30 minute meetings.

01/23 - 05/23	DCS Alumni-Student Mentorship Program
01/23 - 05/23	Computer Science Alumni Mentorship Program, University of Toronto
10/21 - 05/22	Statistical Science Alumni Mentorship Program, University of Toronto
09/20 - 02/21	ProjectX machine learning research competition, University of Toronto
08/20 - 08/21	Her Code Camp, Toronto Ontario
10/18 - 05/19	Department of Statistics Mentorship Program, University of Toronto
09/16 - 05/19	SPROUT Peer Mentorship Program, University of Toronto
09/16 - 05/19	New College E-Mentorship Program, University of Toronto

Last updated: Jun 2023