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

PhD in Computer Science, University of Toronto　　　　　　　　　　　　　　01/21 - present
Supervised by Quaid Morris and Kieran Campbell

MSc. in Computer Science, University of Toronto　　　　　　　　　　　　　　09/19 - 03/21
Supervised by Quaid Morris

BSc. in Computational Biology, University of Toronto　　　　　　　　　　　　09/15 - 06/19
Awarded with distinction

RESEARCH EXPERIENCE

Visiting Graduate Researcher, Memorial Sloan Kettering Cancer Center　　　06/23 - present
Hosted by Quaid Morris

Visiting Graduate Researcher, Memorial Sloan Kettering Cancer Center　　　05/21 - 09/21
Hosted by Quaid Morris

Undergraduate Research Assistant, SickKids Hospital　　　　　　　　　　　05/17 - 09/17
Supervised by Michael Wilson and Anna Goldenberg

PEER REVIEWED PUBLICATIONS

* Indicates equal contribution

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

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

FELLOWSHIPS & AWARDS

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

ACADEMIC TALKS

Mutational Signautres for DNA Damage and Misrepair	05/23
Mathematical Methods in Cancer Biology, Evolution and Therapy (BIRS 23w5084)	
Invited talk	

DAMUTA: Dirichlet allocation of mutations as a function of both damage and DNA repair   11/21

Cold Spring Harbour Laboratory Meeting: Genome Informatics

Selected Talk

TrackSigFreq: subclonal reconstructions based on mutation signatures and allele   01/20
frequencies

Pacific Symposium on Biocomputing

Selected Talk, Poster

GUEST LECTURES

Exploring & Explaining Data in the Wild   03/23

AI & Data Science Post-Graduate Program, Loyalist College

Invited by Prof. Peter Papadakos

Data Collection & Analysis   02/22

PRISM research & mentorship program, University of Toronto

Invited by Prof. Sadia Sharmin

Environmental & Life Sciences Workshop Series   01/20

STEMHub Foundation

Invited workshop series

R for bioinformatics   01/20

Global Society for Genetics and Genome Biology

Invited workshop

OTHER TALKS

Finding the 'I' in science   10/22

ACM Canadian Celebration of Women in Computing

Selected Workshop

Undergraduate research opportunities: how to find them and make them work for you   02/20

UofT Bioinformatics and Computational Biology Student Union

Invited by the BCBSU

How to hack your degree   05/19

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

Fedir Zhydok   09/22 - 12/22

Undergraduate Student, National University of Kyiv-Mohyla Academy

Topic: Identifying metastatic tumours from mutational signatures

Caitlin Timmons   05/21 - 08/22

Undergraduate Student, Memorial Sloan Kettering Cancer Center

Topic: Modelling spatial distribution of mutational signatures in cancer genomes.

Haritha Lakshmanan   05/20 - 11/20

Highschool Student, Memorial Sloan Kettering Cancer Center

Topic: Automatic discovery of mutations predictive of survival in breast cancer patients

PROGAM ADMINISTRATION

Program Organizer   09/21

UofT Graduate Application Assistance Program

Project Manager   10/20 - 05/21

STEMHub Foundation

Founder and treasurer   05/18 - 05/19

Bioinformatics and Computational Biology Student Union, University of Toronto

Event chair: BioHacks   03/18

Bioinformatics and Computational Biology Hackathon

Communications and Marketing Executive   09/16 - 05/17

UofT Women in Computer Science (WiCS), University of Toronto

TEACHING ASSISTANT POSITIONS

Unless otherwise noted, school is University of Toronto

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

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.

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