Jenkin Tsui

675 West 10th Avenue, Department of Molecular Oncology, BC Cancer Research Institute, Vancouver, BC V5Z 0G7

E: jenkin.tsui@aya.yale.edu | W: jenkintsui.com | Git: tsuijenk

Education

University of British Columbia, Bioinformatics Program — *Vancouver, BC*

Ph.D., Bioinformatics — *Jan. 2020 – Dec. 2024*

- PhD thesis on Machine Learning Approaches for Characterizing Spatially Resolved Tumour Microenvironment. Advised by Andrew Roth.
- Advisory Committee: Sam Aparicio, Leonid Sigal, Alexandre Bouchard-Côté
- Proficiency in Coding Languages: Python (e.g. PyTorch, Numpy, Numba, PyTorch Lightning, OpenCV), Unix Shell, R
- Proficiency in Software/Platforms: ImageJ/Fiji, Azure, ML Flow, Weight & Bias, CUDA

Yale University — *New Haven, CT*

M.A., Statistics — *Sep. 2018 – Aug. 2019*

- Directed Studies: Bayesian Methods in fMRI Analyses (advised by Joseph Chang)
- Coursework: Advanced Statistical Inference, Advanced Probability Theory, Linear Models, Neuroimaging Statistics, Non-parametrical Statistical Methods, Statistical Case Studies, Random Matrix Theory

University of Toronto — *Toronto, ON*

B.S., Mathematics, high distinction — *Sep. 2013 – Apr. 2018*

- Senior Co-op project advised by Abel Dasylva and Kenneth Chu
- Directed Studies: Measuring Statistical Evidence (advised by Michael Evans), Fundamental Group and Covering Spaces (advised by Lisa Jeffrey), Complex Dynamics (advised by Giulio Tiozzo)
- Coursework: Complex Analysis I and II, Groups and Symmetry, Fields and Groups, Topology, Partial Differential Equations, Linear Programming and Optimization, Combinatorics, Mathematical Biology, Stochastic Processes, Regression Analysis, Statistical Inference, Data Collection, Biostatistics

Research Experience

BC Cancer Research Institute — *Vancouver, BC*

Research Scientist, IMAXT Consortium (Cancer Grand Challenges) — *Jan. 2020 - present*

• Lead, design, and implement machine learning approaches for characterizing single cell spatial genomics data.
• Project 1: AnglerFISH is a deep-learning based model that can perform detection, localisation, and gene labelling assignment in 2-3 minutes on a nVIDIA RTX 3090 GPU on in-house merFISH spot-channel images.
• Project 2: NucleiSeg is a hierarchical Bayesian approach for unsupervised learning of cell nuclei in merFISH images.

RIKEN Center for Integrative Medical Science — *Yokohama, JP*

Research Fellow in Michiel de Hoon's lab and FANTOM6 Consortium — *Jun. 2019 – Aug. 2019*

- Modeled lncRNA structures and performed statistical analyses on gene expression using the sequencing data from PARIS protocol and its computational complement CRSSANT; the identified clover leaf structure enabled collaborators to further understand the functions of lncRNA that serve key regulatory roles in modulating tumor suppressor.

Statistics Canada — *Ottawa, ON*

Research Intern with Abel Dasylva and Kenneth Chu — *May 2017 – Aug. 2017*

- Wrote a mathematical proof that contradicted the maximum likelihood estimating equation by Chipperfield et al.
- Led, designed, and implemented an optimal likelihood estimating equation for logistic regression using quasi-likelihood framework.

University of Toronto — *Toronto, ON*

Research Intern in Phani Radhakrishnan's Organizational Behavior research team — *Sep. 2015 - Mar. 2016*

Bank of Nova Scotia — *Toronto, ON*

Analyst Intern at Technological Crimes and Forensic Unit — *May 2015 - Aug. 2015*

- Led, designed, and implemented a Time Series ARIMA model for investigating fraudulent behaviors related to electronic frauds; this enabled the team to conduct further trend analyses on tech crimes for the past 10 years from 2005-2014.

Machine Learning Research

Jenkin Tsui*, Jabed Tomal. Ultrahigh Dimensional Variable Selection for Mammalian Eye Gene Expression. *University of Toronto*, 2018.

Statistics and Mathematics Research

Jenkin Tsui, Giulio Tiozzo. Linearization of Analytic Germs: Yoccoz's Lower Bound, *University of Toronto*, 2018.

Jenkin Tsui*, Abel Dasylva, Kenneth Chu. Optimal Estimating Equation for Logistic Regression with Linked Data. arXiv:1707.05825. **MAA General Contributed Paper Session on Probability and Statistics, JMM 2018.**

Teaching

University of British Columbia, Department of Statistics — *Vancouver, BC*
Jan. 2020 - present
TA for Graduate Statistical Inference (STAT460/560), Statistical Methods for High Dimensional Biology (STAT540), Applied Statistical Methods (STAT300), Introductory Statistics (STAT200) – in total 10 labs with approx. 30 students each.

Yale University — *New Haven, CT*
Sep. 2018 – Apr. 2019
TA for Intro. Statistics (S&DS 100), Intro. Statistics for Social Sciences (S&DS 103)

University of Toronto — *Toronto, ON*
Jan. 2016 – Apr. 2018
TA for Multivariable Calculus II (MAT B42), Multivariable Calculate I (MAT B41), Honors Calculus II (MAT A37), Mathematical Statistics (STA B57), Introductory Statistics (STA B22), Social Statistics (STA B23) – in total 16 labs with approx. 30-35 students each.

University of Michigan — *Ann Arbor, MI*
Sep. 2017 – Dec. 2017
Tutor for Single Variable Calculus (MAT 115, MAT 185)

Selected Honors & Awards

2022 **CIHR PhD Research Fellowship, Finalist**, Canadian Institute of Health Research
2021 **Vanier Canada PhD Fellowship, Finalist**, Government of Canada
2021 **CIHR PhD Research Fellowship, Finalist**, Canadian Institute of Health Research
2021 **EMBL-EBI Research Fellowship, $1,000 GBP pcm**, European Bioinformatics Institute
2020 **UBC Four Year Doctoral Fellowship, $32,000 CAD p.a.**, University of British Columbia
2019 **RIKEN IMS Fellowship Grant, $6,780 USD**, National Research and Development Agency, Government of Japan
2018 **High distinction**, University of Toronto
2018 **Joint Mathematics Meeting Academic Conference Travel Fund, $1,500 CAD**, University of Toronto (UTSC)
2018 **Senior Dean's List**, Department of Computer and Mathematical Sciences, University of Toronto (UTSC)
2017 **University of Michigan International Exchange Award, $6,000 CAD**, University of Toronto
2017 **Fulbright Canada Killam Fellowship, $5,750 CAD**, Fulbright Canada
2017 **SUMM 2017 Department Academic Conference Travel Fund**, University of Toronto (UTSC)
2016 **Junior Dean's List**, Department of Computer and Mathematical Sciences, University of Toronto (UTSC)