Curriculum Vitae
Man Yeung, Tai (Andy)

Personal Information

Name:	Man Yeung Tai (Andy)
Nationality:	Canadian
Date and place of birth:	October 25th, 1994; Vancouver, Canada
Language:	English (Mother) – Cantonese (Fluent)
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Dissertation	http://hdl.handle.net/2429/87759

Education

Sep. 2019 – April 2024	**University of British Columbia (UBC), Vancouver, Canada** Master of Science in Neuroscience PhD program (Fast Track) Supervisor: Dr. Reinhard Michael Krausz Committee members: Dr. Alireza Kazemi Dr. Raymond Ng. Dr. Christian Schuetz
2012- 2017	**University of Toronto, Toronto, Canada** Honors Bachelor's in Science (BSc) Program: Neuroscience Major Environmental Science Minor Religion Minor
2008 - 2012	**West Point Grey Academy, Vancouver, Canada** High school Diploma

Work Experience

April 2024 - Present	**NAI Innovations, Vancouver, BC, Canada — Analyst** Specialize in evaluating ML-driven startups and companies in medical cannabis symptom management. Analyze data trends, optimize algorithm performance, and communicate findings. Lead strategic AI initiatives aligned with advances in neuroscience and psychiatry.
April 2024 - Present	**Concussion RX, Vancouver, BC, Canada — Data Scientist** AI-powered concussion care position focused on enhancing diagnosis and treatment using advanced AI tools like ConcussionRX and Llama 3. Key tasks include developing healthcare professional onboarding documents, employing machine learning and statistical modeling to analyze and stratify concussion subtypes based on demographic data.
Mar 2024- April 2024	**Department of Computer Science, Master of Data Science Program, UBC** DSCI 532: Data Visualization II, Block 6
Feb 2024 – Mar 2024	**Department of Computer Science, Master of Data Science Program, UBC** DSCI 553: Statistical Inference and Computation II, Block 5
Jan 2024 – Feb 2024	**Department of Computer Science, Master of Data Science Program, UBC** DSCI 524: Collaborative Software Development, Block 4
Nov 2023- Dec 2023	**Department of Computer Science, Master of Data Science Program, UBC** DSCI 522: Data Science Workflows, Block 3
Oct 2023 – Nov 2023	**Department of Computer Science, Master of Data Science Program, UBC** DSCI 531: Data Visualization I, Block **2**
Sep 2023 – Oct 2023	**Department of Computer Science, Master of Data Science Program, UBC** DSCI 523: Programming for Data Manipulation, Block 1
Jul 2023 - Aug 2023	**Department of Computer Science** Teacher's Assistant for CPSC 121: Models of Computation
Jan 2023 - Apr 2023	**Department of Computer science** Teacher's Assistant for DSCI 320: Intro to Data Viz Instructor: Kemi Ola
Mar 2023 - Apr 2023	**Department of Computer Science, Master of Data Science Program, UBC** Teacher's Assistant for DSCI 541: Privacy, Ethics, and Security, Block 6 Instructor: Joel Ostblom
Feb 2023 - Mar 2023	**Department of Computer Science, Master of Data Science Program, UBC** Teacher's Assistant for DSCI 532 Data Visualization II, Block 5 Instructor: Florencia D'Andrea.
Jan 2023 - Feb 2023	**Department of Computer Science, Master of Data Science Program, UBC** Teacher's Assistant for DSCI 524 Collaborative Software Development, Block 4

Instructor: Florencia D'Andrea.

Jul 2022- Aug 2022	**Department of Computer science** Teacher's Assistant for CPSC 322: Introduction to Artificial Intelligence Instructor: Jordon Johnson
Jan 2022 – Apr 2022	**Department of Computer science** Teacher's Assistant for CPSC 322: Introduction to Artificial Intelligence Instructor: Jordon Johnson
Mar 2022 – Apr 2022	**Department of Computer Science, Master of Data Science Program, UBC** Teacher's Assistant for DSCI 541: Privacy, Ethics, and Security Instructor: Joel Ostblom
Feb 2022 – Mar 2022	**Department of Computer Science, Master of Data Science Program, UBC** Teacher's Assistant for DSCI 532: Data Visualization II Instructor: Florencia D'Andrea
Jan 2022 – Feb 2022	**Department of Computer Science, Master of Data Science Program, UBC** Teacher's Assistant for DSCI 524: Collaborative Software Development Instructor: Florencia D'Andrea
Nov 2021 – Dec 2021	**Department of Computer Science, Master of Data Science Program, UBC** Teacher's Assistant for DSCI 522: Data Science Workflows Instructor: Tiffany Timbers
Oct 2021 – Nov 2021	**Department of Computer Science, Master of Data Science Program, UBC** Teacher's Assistant for DSCI 552: Statistical Inference and Computation I Instructor: Joel Ostblom
Sep 2021 – Oct 2021	**Department of Computer Science, Master of Data Science Program, UBC** Teacher's Assistant for DSCI 523: Programming for Data Manipulation Instructor: Tiffany Timbers
Sep 2021 – Dec 2021	**Faculty of Science, Department of Stat, Online Course Support** Graduate academic assistant
Sep 2021 – November 2022	**AP Psychology Tutor** UHubor Education
Jan 2021 – Apr 2021	**Faculty of Medicine, Master of Neuroscience Program, UBC** Teacher's Assistant for NRSC 501: Neuroscience II
Apr 2021 – May 2021	**Department of Computer Science, Master of Data Science Program, UBC** Teacher's Assistant for BAIT 509: Business Applications for Machine Learning Instructor: Hayley Boyce

Mar 2021 - Apr 2021	**Department of Computer Science, Master of Data Science Program, UBC** Teacher's Assistant for BAIT 580A: Database Applications in Business Systems Instructor: Simon Goring
Jan 2021 – Feb 2021	**Department of Computer Science, Master of Data Science Program, UBC** Teacher's Assistant for DSCI 532: Data Visualization II Instructor: Joel Ostblom
Sep 2021- Present	**Undergraduate Research in Natural and Clinical Sciences and Technology (URNCST) Journal** Associate Editors
Nov 2020 – Dec 2020	**Department of Computer Science, Master of Data Science Program, UBC** Teacher's Assistant for DSCI 573: Feature and Model Selection Instructor: Varada Kolhatkar
Oct 2020 – Nov 2020	**Department of Computer Science, Master of Data Science Program, UBC** Teacher's Assistant for DSCI 571: Supervised Learning I Instructor: Varada Kolhatkar
Sep 2020 – Oct 2020	**Department of Computer Science, Master of Data Science Program, UBC** Teacher's Assistant for Course DSCI 551: Descriptive Statistics and Probability for Data Science Instructor: Aaron Berk
Mar 2020 – Apr 2020	**Department of Computer Science, Master of Data Science Program, UBC** Teacher's Assistant for Course, DSCI 541: Privacy, Ethics, and Security Instructor: Firas Moosvi
Feb 2020 – March 2020	**Department of Computer Science, Master of Data Science Program, UBC** Teacher's Assistant for Course, DSCI 524: Collaborative Software Development Instructor: Varada Kolhatkar
Jan 2020 – Feb 2020	**Department of Computer Science, Master of Data Science Program, UBC** Teacher's Assistant for Course, BAIT 509: Business Applications of Machine Learning Instructor: Tomas Beuzen
No 2019 – Now	**Building blocks (Student lead organization)** Founder/CEO An app created to guild new students in university and match them with mentors https://buildingblocksapp.wixsite.com/buildingblocks
Nov 2019 –	**West Point Grey Academy High School (WPGA) Athletics**

Mar 2020	Grade 8 Basketball Head coach
Sep 2019 – Oct 2019	**Department of Computer Science, Master of Data Science Program, UBC** Teacher's Assistant for Course: BAIT 507: Data Management for Business Analytics Instructor: Simon Goring
Sep. 2019 – Dec. 2019	**Split Second Basketball** Youth Basketball Coach (Grade 1-12)
Nov. 2018 – Aug. 2019	**Addiction and Concurrent Disorder Group (ACD), Institute of Mental Health, UBC** Research Assistant PI: Michael Krausz **Key Words:** E-Mental Health, Walk Along, Risk Assessment Management Platform (RAMP) **Synopsis:** Ongoing contributions to projects on E-Mental health: Walk Along, Risk Assessment and Management Platform (RAMP), E-Mental Health Conference.
Nov 2018 – Mar 2018	**West Point Grey Academy High School (WPGA) Athletics** Grade 6 Basketball Head coach
Nov 2018 – Dec 2018	**BC Children's Hospital, Child and Family Research Institute, UBC** Research Assistant PI: Clare Louise Beasley **Key Words:** Morphology of Microglia in Bipolar/Schizophrenic patients **Synopsis:** Exposure to Bipolar and Schizophrenic patient's cortical brain tissue. Work was done to identify different morphologies of microglia, in control, Bipolar and schizophrenia patients.
Sep 2018 – Dec 2018	**NAI Interactive Ltd.** Research analyst **Key Words:** Data mining of biotech field **Synopsis:** Researching information, and data in regard to specific pipeline biotech company projects.
May 2017 – June 2018	**Sick Kids, Peter-Gilligan Center for Research and Learning (PGCRL), UofT** Lab Technician PI: Sheena Josselyn **Key Words:** Epitranscriptomics, Animal Models, Optogenetics, Behaviour **Synopsis:** Work was done under a PHD student on shaping behavior of mice that underwent optogenetic surgery, with operant boxes. This project was focused on understanding the wiring of the reward pathways of the amygdala. Work was also done under a Post Doctorate microbiologist, by manipulation of DNA constructs through procedures such as ligations, transformations, into

bacteria, which was then injected into neuronal syntactical space for testing an RNA RNase. This project was focused on exploring epitranscriptomics in neurons.

Jan 2016 – May 2017	**Toronto Western Hospital, Mood Disorder Pharmacology Unit (MDPU), UofT** Research Assistant PI: Roger S. McIntyre **Key Words:** Big Data, Machine Learning, Psychiatry Models **Synopsis:** First author paper submission. In addition, work accomplished with a meta-analysis paper on the effects of THC on Cognition.
May 2015 – Jun. 2017	**Hart House, UofT** Lifeguard at the Hart House pool

Publications

July, 2024	**A machine learning approach to predicting overdose risk** Submitted First Author, Journal of Health Management
July, 2024	**Utilizing machine learning for early intervention and risk management in the opioid overdose crisis: a systematic review and meta-analysis in addiction psychiatry** Submitted, under review First author, WIREs computational statistics
June, 2024	**Clinical decision support systems in addictions and concurrent disorders: a systematic review and meta analysis** Accepted First author, Journal of Evaluation in Clinical Practice
October 2023	**Adherence in E-Health interventions for substance use and the factors influencing it: systematic review, meta-analysis, and meta-regression** Published https://journals.sagepub.com/doi/full/10.1177/20552076231203876 Second Author, Sage: Digital Health.
June, 2023	**Online Availability and Distribution of Psychoactive Substances: Data from Dark Web Markets between 2012 and 2019** Published https://journals.sagepub.com/doi/10.1177/20503245231215668 Second author, Drug Science, Policy and Law
June, 2023	**Risk Assessment and Management Platform (RAMP) – The clinical concept and digital translation of mental healthcare into a web-based platform** Manuscript in preparation

Third author
Target Journal: Journal for Internet Medical Research (JMIR)

June, 2023	**A call for an evidence-based strategy against the overdose crisis** Published Third author The Canadian Journal of Psychiatry: https://journals.sagepub.com/doi/full/10.1177/07067437231188202
June, 2023	**Architecture and Development Framework for RAMP - a Risk Assessment and Management Platform Addressing Opioid Overdose** Submitted Fourth author Journal of Medical Internet Research (JMIR) mHealth and uHealth
June, 2023	**Exploring the Potential and Limitations of ChatGPT for Academic Writing: Addressing Linguistic Injustice and Ethical Concerns** Published First Author Journal of Academic Language and Learning https://journal.aall.org.au/index.php/jall/article/view/903
April 26th, 2023	**Medical Students' Views on Psychiatry in Germany and Italy: Survey** Published First Author, contributed 90% of the paper. International Journal of Mental Health Promotion. Published: https://cdn.techscience.cn/files/ijmhp/2023/TSP_IJMHP-25-9/IntJMentHealthPromot-25-09-30087/IntJMentHealthPromot-25-30087.pdf Preprint: https://doi.org/10.2196/preprints.31727 https://cdn.techscience.cn/files/ijmhp/2023/TSP_IJMHP-25-9/IntJMentHealthPromot-25-09-30087/IntJMentHealthPromot-25-30087.pdf
April 29th 2021	**Treatment approaches and outcome trajectories for youth with high-risk opioid use: A narrative review DOI: 10.1111/eip.13155** Second author role, contributed 49% of the paper. Published with John Wiley & Sons Australia, Early Intervention in Psychiatry. https://onlinelibrary.wiley.com/doi/10.1111/eip.13155
March 11th, 2022	**Egyptian Students open to digital Mental Health Care: A Cross-Sectional Survey.** Second Author, contributed 60% of the paper. Journal of Medical Internet Research (JMIR) Formative Research.

August 8th 2019	**Machine learning and big data: Implications for disease modeling and therapeutic discovery in psychiatry DOI: 10.1016/j.artmed.2019.101704** First author role, contributed 80% of the paper. Published with Elsevier, Artificial Intelligence in Medicine. https://www.sciencedirect.com/science/article/pii/S0933365717301781?via%3Dihub

Academic presentations/participated

June 9-10, 2023	**1st Canadian Academy of Addiction Psychiatry (CAAP) conference** BC Mental Health & Substance use services (BCMHSUS) University of British Columbia (UBC) Provincial health services authority (PHSA) Event coordinator/participant
Mar 9th 2023	**3rd Annual BC Concurrent Disorders Conference (Hosted by BCMHSUS) conference.** Lightning talk: Machine Learning: A Predictive Model for Overdose
April 18, 2023	**Let's Talk Overdose: Shortcut to Survival for Adolescents and Young Adults** Andy Man Yeung Tai
December 6th 2022	**Translation in Action: from Neuropsychiatry Research to Health Solutions** Live e-Poster presentations The Application of Machine Learning and Predictive Modelling to Understand Risk of Overdose Andy Man Yeung Tai
April 6th – 7th 2022	**Let's Talk Overdose** **April 06, 2022 / 09:20 AM - 10:20 AM** **Workshop** Risk assessment & risk prediction Dr. Raymond Ng, Dr. Alireza Kazemi, Andy Man Yeung Tai

April 6th – 7th
2022

Let's Talk Overdose
Wednesday April 06, 2022 / 09:20 AM - 10:20 AM
Workshop
Implementation of a decision support for clinicians and vulnerable populations:
a systemaic review
Jane Kim & Andy Man Yeung Tai

Jan 25th
2022

Virtual Solutions for Substance Use Conference
Workshop
Chatbots in substance use care: A consensus discussion
Andy Man Yeung Tai and Jane Kim

June 23rd
2021

'Let's Talk Overdose: The Hidden Pandemic and How to Stop it'
Workshop
How to examine overdose risk factors and predictors
Andy Man Yeung Tai and Craig Hutton

April 3rd
2021

UBC Psychiatry 2021 VIRTUAL RESEARCH DAY **- The Application of**
Machine Learning and Predictive Modelling to Understand Risk of
Overdose (A preliminary model)
Poster presentation
Andy Man Yeung Tai

Mar
3th – 4th
2021

The 10th Annual E-Mental Health Conference: Virtual Care in Times of
Crisis and Beyond - Using Machine Learning to Determine Risk Factors of
Fatal Overdose
Workshop
Alireza Kazemi and Andy Man Yeung Tai

Jan 25,
2021

High-Risk Substance Use and Overdose Among Youth Conference
Workshop moderator for:
Block 1: Prevention and Early Intervention for Adolescent Substance Use
Dr. Martha J. Ignaszewski and Dr. Emily Tejani
Block 2: The Role of Childhood Trauma in Vulnerability to Substance Use
among Youth: Implications for Early Targeted Interventions
Dr. Hanie Edalati
Block 3: Biological risk factors for high-risk substance use
Dr. Christian Schütz

Dec 9th
2020

VIRTUAL SOLUTIONS FOR SUBSTANCE USE CARE CONFERENCE
- The Application of Machine Learning Methods and Predictive Modelling in
the Field of Addiction Psychiatry
Keynote speaker
Alireza Kazemi and Andy Man Yeung Tai

Nov 25th 2020	**CAIDA: Emerging Technologies: BC's AI Showcase** Poster presentation. A predictive model for overdose Andy Man Yeung Tai
Oct 21st 2020	**Canadian Academy of Psychiatry Epidemiology (CAPE): 2020 Annual Scientific Symposium** Poster presentation. A predictive model for overdose Andy Man Yeung Tai
Sep 24th – 25th 2020	**Machine learning: Innovative Applications in Psychiatry and Public Health.** 2nd Annual International Psychiatry Congress of Tanta Neuropsychiatry Department "eMental Health" 15-minute keynote speaker Andy Man Yeung Tai
June 20- 24 2020	**Review of Current Treatments for Youth With Opioid Use Disorder (OUD)** Poster presentation. 2020 CPDD Workshop International Research Poster Session. Andy Man Yeung Tai
June 19-21 2020	**Review of Current Treatments for Youth With Opioid Use Disorder (OUD)** Poster presentation. 2020 Nida International Forum Andy Man Yeung Tai
June 20, 2019	UBC Psychiatry 2019 RESEARCH DAY **Risk assessment and Management platform** Lightning talk Andy Man Yeung Tai
Feb. 2020	**British Columbia Centre for Disease Control (BCCDC) Geography and Overdose (GEOOD) Conference.** Building a public health and research agenda for addressing geographic contributors to overdose. Andy Man Yeung Tai
June 2019	**Altered Microglial Morphology in Prefrontal Cortex in Schizophrenia and Bipolar Disorder** Contributor. World Congress of Biological Psychiatry. Andy Man Yeung Tai

Feb 1st – Feb 2nd 2019	**Addiction and concurrent disorders' E-Mental Health Conference.** **The Use of Artificial Intelligence in Predicting Fatal Opioid Overdoses – Results of a Key Informant Survey of Psychiatrists and Family Physicians.** Poster presentation. Addiction and concurrent disorders' E-Mental Health Conference Andy Man Yeung Tai
Feb 1st – Feb 2nd 2019	**Addiction and concurrent disorders' E-Mental Health Conference.** **Technology Access, Literacy, and Interest among Patients with Concurrent Substance Use and Mental Health Disorders** Poster presentation. Addiction and concurrent disorders' E-Mental Health Conference Andy Man Yeung Tai

Internships

October 30th 2022– January 22nd 2023	University of Sydney, Brain and Mind Centre, Digital Mental Health Team. Project Title: Machine Learning Synergy Home University Superivor: Dr. Michael Krausz Host University Supervisor: Dr. Ian Hickie and Dr. Frank Iorfino Knowledge translation, presentation on work at home university (UBC). Andy Man Yeung Tai

Awards

October 30th 2022– January 22nd 2023	**Mitacs Globalink Research Award - for research abroad** Project Title: Machine Learning Synergy *Intern stipend Andy Man Yeung Tai 30-Oct-2022 — 22-Jan-2023 FR94347 $2,000.00* *Materials and Research Costs ** Must be spent by Mar 22, 2023 $4,000.00* *TOTAL AWARD $6,000.00*
2021/2022	**University of British Columbia (UBC) Master of Data Science (MDS) Teacher's Assistant (TA) Award** For Outstanding Work in DSCI 524, 541, 531 and DSCI 523, 532, 522 **2021/2022**
2021-2023	**President's Academic Excellence Initiative PhD Award** Awards totalling approximately $4.3 million per year are provided to recognize the significant contributions of PhD students to the research activities of the university. The awards are available to all new and continuing PhD students, except those who have their tuition paid by an external sponsor*.

June 4th 2021	**2021 Research Day Lightning Talk & ePoster People's Choice Award**
	<u>Clinical Research Poster</u>:
	Andy Man Yeung Tai, The Application of Machine Learning and Predictive Modelling to Understand Risk of Overdose (A preliminary model)

Oct 2019	**Faculty of Medicine Graduate Award**
	Funded by the Graduate Support Initiative, awards are offered to domestic and international students who are registered full-time in PhD, DMA, and Master's (except full cost-recovery) degree programs at The University of British Columbia.

Mar 2019	**NIDA Travel award**
	$500 travel award (U.S. dollars) for the 2020 NIDA International Forum.

COMPETITIVE FUNDING (including Fellowships and Research Grants):

Funder:	Project Title:	$ Awarded	Years Funded
Health Canada	*Project Title: Risk Assessment and Management Platform (RAMP): An Online Overdose Risk Score System with Tailored Feedback to Improve access and connect Users to Existing Resources and Improve Their Long-term Overdose Risk.)*	*$1,407,790*	3

Volunteer Experiences

May 2023 - Present	Sherpa: Blog Writer Demo
	Developing the Blog Writer demo with Sherpa and LangChain, enabling automated blog creation from audio transcripts using LLM APIs. This demonstrates Sherpa's ability to enhance workflows through flexible AI integration.

Jan – May 2023	Comparative Analysis of Treatment Outcomes and Reliability in In-Person and Telemedicine Healthcare for Mental Disorders: A Literature Review Mentored paper Jadeyn Feng University of Toronto
Jan – May 2023	The Role of E-Health Platforms in Detecting and Providing Early and Ongoing Treatment for Mental Health in Low-Income Developing Countries: A Review Mentored paper Sejal Jain Nova Southeastern University
Jan – May 2023	What are some comorbidities of overdose: A systematic literature review Mentored paper David Walji, BHSc Student, Emily Li, BHSc Student Department of Health Sciences, Queen's University, Kingston, Ontario, Canada
June-August 2022	Feasibility study: Machine learning in neurodegenerative disorders, Alzheimer's' disease URNCST Mentored paper program Xiangxuan Kong University of Toronto
Jan 2021	UBC Neuroscience Undergraduate Club, Neuroscience Undergraduate Research Conference (NURC) 2021 Conference oral presentation judge
2021 March 13th – 14th	Trident Tournament CS:GO Esports Partner with UBC, SFU, UVIC Sponsored by Memory Express 600 dollar tournament
Sep 2019-present	Building blocks Founder Non-profit peer mentoring app organization Corporation Number 1176510-8
Sep 2019 – January 2020	Coast Mental Health Help promote recovery of people with mental illness in this Vancouver-based non-profit housing organization. **Synopsis:** Games/Movie night coordinator + One on one mentorship at St. Helen's Hotel, 1161-1163 Granville St, Vancouver, Canada
Mar. 2018	UofT Charity Intramural All-Star Basketball Game **Synopsis:** Selected to participate in the charity intramural all-star game. All proceeds go towards the RightToPlay charity.

Sep. 2013 – Jun. 2014	Help Program / Toronto Western Hospital **Synopsis:** I was able to work in a ward in Toronto Western, and take part of patient care. The intent of this program was to help the elderly avoid onset of Dementia and Alzheimer.
Mar. 2012	ME to We, Kenya Outreach Program Assistant **Synopsis:** With Me to We, departing from Vancouver I took week long trip to volunteer to build a school in the suburbs of Kenya, in the Masa Mara.

Clubs

Sep 2019 – Aug 2020	Neuroscience Graduate Student Association (NGSA) Position: Vice President Student Life The Student Advisory Committee will oversee the development of the disorder-specific ideal suite of services for the purposes of the UBC e-Mental Health study.
Sep 2019 – Aug 2021	Walter Gage Toastmasters A Club that improve your communication and build leadership skills.
Sep 2019 – Aug 2020	Neuroscience Graduate Student Association (NGSA) Position:1st year representative The Student Advisory Committee will oversee the development of the disorder-specific ideal suite of services for the purposes of the UBC e-Mental Health study.
Sep 2019 – Sep 2023	UBC E-Sports CS:GO director

Merits

2012 - 2014	Varsity Basketball Team UofT

Personal Skills

First languages	English
Other languages	Cantonese, Mandarin
Computer skills	**Tools:** MS Office, Google Suite, Atom, Mendeley, Adobe, Photoshop, GitHub project workflow, SQL, VScode, Juypter lab, SPSS, Wix, Rstudio, Slack, Covidence, Nvivo, Wordpress **Languages:** R, Pythons, JavaScript, React (minor) **Others:** Experience with hardware, mobile applications on Android, embedded systems, data analytics, machine learning, AI

Qualifications	Officers' Partners' and Directors' Course (IFSE)
	First Aid and CPR-C
	NLS Lifeguard
	Nalaxone trained

Research Interests

Sciences and other	• Neuroscience
	• Psychology
	• Sociology
	• Addiction and mental health
	• Nutrition
	• Philosophy
	• Electronic Mental Health
	• Programing, Artificial Intelligence, Machine Learning

Bio

My career in research started in 2015, when I researched out to a former professor at the University of Toronto, where I attained my undergraduate degree in Neuroscience. My experiences in the Mood Disorder and Pharmacology Unit (MDPU) of the McIntyre Lab at Toronto Western Hospital allowed me to work on a literature review article on how artificial intelligence (AI), machine learning (ML) and big data could play a role in psychiatry. This opened my eyes to how I could contribute in medical practice through the analysis of big data with next generation technology such as artificial intelligence and machine learning. This research experience resulted in a first author manual-script publication to Elsevier's journal, Artificial Intelligence in Medicine [1]. It was the exposure to the frontiers of the unknown in neuroscience research with the Josselyn Lab at Sick Kids Hospital that sparked my interest in research. In her lab, I investigated epitranscriptomics and behavioural studies of the amygdala with optogenetics. Under the microbiologist Dr. Brandon Walters, I accumulated molecular biology skills such as mini prepping, PCR, cell transformations, cell culturing, DNA sequencing and cell transformation. Under the PHD student Alex Jacob, I handled mice, and learned skills such as perfusions, animal brain slicing and imaging, optogenetic testing and operant conditioning.

Upon my return to Vancouver in July 2018, my aspiration was to pursue my academic journey at the esteemed institution, UBC. During my time at UBC, I had the privilege of working in two distinct laboratories. Initially, I joined Dr. Clare Louise Beasley's lab at BC Children's Hospital, Child and Family Research Institute. In this lab, I acquired expertise in identifying morphological microglia and classifying them into amoeboid, rod, and dystrophic groups based on samples from patients with Bipolar disorder, Schizophrenia, and control subjects. Subsequently, I had the opportunity to work under the guidance of Dr. Michael Krausz in the Addiction and Concurrent Disorder Group (ACD group) at the Institute of Mental Health at UBC. Since joining the ACD lab in 2018, I have been actively involved in a significant government-funded initiative called the Risk Assessment and Management Platform (RAMP). This multi-year project, with a budget of 1.4 million dollars, received funding from the Substance Use and Addictions Program of Health Canada from 2019 to 2021.

RAMP aims to develop an online e-mental health platform to address the overdose crisis in British Columbia. Notable features of RAMP include risk assessment, online intervention modules, and behavioral tracking to mitigate risky behaviors within the drug-using population. Within the framework of this project, I had the opportunity to leverage my expertise in AI/ML to create a predictive risk model. This model will be integrated into RAMP, serving as a crucial component of the risk assessment process.

During my academic journey, I have been fortunate to collaborate with esteemed international doctors from various countries, including Egypt, Switzerland, Germany, and Australia. One noteworthy collaboration took place between 2019 and 2021, when I had the opportunity to work with Dr. Mostafa Mamdou, an Egyptian Psychiatrist with MD, MSc, and PhD credentials. Together, we published research exploring the receptiveness of Egyptian students to utilizing e-mental health platforms similar to RAMP [2]. Furthermore, I have been closely collaborating with Dr. Frank Iorfino from Australia, Dr. Maximillian Meyer from Switzerland, and Jim Schmeckenbecher, a German PhD candidate, on manuscripts that are either under review or currently in progress. A comprehensive list of publications I am currently involved in can be found in my long-form CV.

In addition to my involvement in publications, I have actively participated in numerous conferences, both locally and internationally. At local conferences such as the Let's Talk Overdose conferences, UBC Psychiatry Research Day, CAIDA: Emerging Technologies: BC's AI Showcase, and the 3rd Annual BC Concurrent Disorders Conference hosted by BCMHSUS, I had the privilege of hosting workshops on various computer science topics, including chatbots and the use of machine learning to predict overdose risk factors. Furthermore, I have presented my work internationally, including a keynote speech at the 2nd Annual International Psychiatry Congress of Tanta Neuropsychiatry in Egypt and participation in the annual College on Problems of Drug Dependence in the United States, where I discussed similar topics. I am proud to mention that my presentations have received recognition and awards, such as the UBC 2021 Research Day Lightning Talk & ePoster People's Choice Award.

In addition to my academic accomplishments, I have actively embraced teaching and mentoring roles throughout my journey as a graduate student. As an Associate Editor for The Undergraduate Research in Natural and Clinical Science and Technology (URNCST) Journal, I have had the privilege of guiding multiple teams of undergraduate students in the URNCST Mentored Paper program. Together, we have explored diverse topics ranging from AI to psychiatry and mental health. These experiences have allowed me to contribute to the growth and development of aspiring researchers, fostering an environment where both students and academics can excel, engage, and make a meaningful impact in their respective fields.

Furthermore, I have had the honor of serving as a guest lecturer and a teacher's assistant for undergraduate and master's programs, including Neuroscience, Computer Science, and Data Science. Through these roles, I have had the opportunity to share my knowledge and enthusiasm for these subjects, inspiring students and creating a supportive learning environment. I strongly believe in the power of education as a catalyst for transformative

change, and I am dedicated to nurturing the next generation of scholars and practitioners in the fields of Neuroscience, Computer Science, and Data Science.

My commitment to teaching and mentorship has been acknowledged through prestigious accolades, such as the 2021/2022 Teaching Assistant Award in the Master of Data Science program at UBC. This recognition reaffirms my dedication to fostering a supportive and enriching learning environment where students can thrive and reach their full potential.

In summary, my journey as a graduate student has not only been marked by my research endeavors but also by my passion for teaching and mentoring. By combining my expertise in research with my dedication to education, I aim to inspire and empower students, equipping them with the skills and knowledge they need to become successful professionals in their chosen fields.

Works cited:
1. Tai, Andy MY, et al. "Machine learning and big data: Implications for disease modeling and therapeutic discovery in psychiatry." *Artificial intelligence in medicine* 99 (2019): 101704.
2. Mamdouh, Mostafa, et al. "Egyptian Students Open to Digital Mental Health Care: Cross-Sectional Survey." *JMIR Formative Research* 6.3 (2022): e31727.

Research Impact Statement

This research impact statement outlines the anticipated impact and contributions of my research in the field of Neuroscience, which focuses on utilizing interdisciplinary fields such as artificial intelligence, computer science, data science, and psychiatry to find innovative solutions to complex multimodal problems in healthcare. Specifically, my research addresses the ongoing opioid crisis in Vancouver, British Columbia, by employing machine learning techniques to model the risk of fatal overdose and create clinical decision support systems for addressing risky behaviors at the individual level. Additionally, the potential application of my work extends to predicting comorbid outcomes such as mental health disorders, suicide, and suicidal ideation, thereby enabling personalized treatment trajectories.

The opioid crisis has presented a significant challenge to public health in Vancouver since 2015, requiring comprehensive and tailored approaches to mitigate its impact. By leveraging interdisciplinary knowledge and advanced machine learning techniques, this research holds immense significance in developing innovative solutions to address the complex and multifaceted nature of the crisis. Additionally, the potential application of the research in predicting comorbid outcomes widens its impact across various domains within healthcare and mental health.

This research makes substantial contributions to multiple disciplines, including neuroscience, computer science, data science, and psychiatry. By integrating these fields, we expand the

knowledge and methodologies available for addressing the opioid crisis. Through the utilization of machine learning techniques, we enhance risk assessment capabilities, enabling accurate modeling of the risk of fatal overdose and prediction of comorbid outcomes. This interdisciplinary approach promotes collaboration and innovation, advancing the understanding of addiction, mental health, and effective treatment strategies.

From a theoretical perspective, our research contributes to the understanding of addiction and mental health disorders by elucidating the complex relationships and risk factors involved. By developing machine learning models that integrate diverse data sources, including clinical information, behavioral patterns, and social determinants of health, we advance theoretical frameworks, providing insights into the mechanisms underlying these conditions.

Practically, the research has significant implications for clinical practice and healthcare professionals. The development of clinical decision support systems, embedded with machine learning models, empowers clinicians, healthcare workers, and professionals working with vulnerable populations to identify high-risk behaviors. By providing personalized suggestions for interventions and treatments, these systems enable tailored care for individuals, resulting in improved outcomes and a more personalized treatment trajectory. The potential extension of this work to predict comorbid outcomes further enhances the applicability and impact across mental health domains, enabling early identification and intervention.

By utilizing machine learning techniques, we enhance risk assessment, enable tailored care, and create clinical decision support systems that empower clinicians and professionals working with vulnerable populations. Furthermore, the potential extension of the research to predict comorbid outcomes expands its application and relevance in mental health domains. Through this work, we aim to contribute to improved outcomes, early intervention, and a more personalized approach to treatment within the opioid crisis and mental health domains.

References

Additional contact information available upon request

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