



The VADA Program

Visual and Automated Disease Analytics
Graduate Training Program

NEWSLETTER

LETTER FROM THE VADA PROGRAM PRINCIPAL INVESTIGATOR, DR. POURANG IRANI



Greetings – I hope you all had a great summer and are looking ahead to a productive academic year!

We welcome our new cohort of students and send farewells to another successful group of students that have completed the

VADA program. This year we have 8 Masters students, 6 new Doctoral students, and 8 returning Doctoral students that will participate in the VADA program for their second year. We also welcome our new program coordinator, Viktoriya Vasykiv, who is an alumna of the program herself and thank Alison Poppel for her many years of dedication to this role.

We have an exciting year ahead of us with VADA activities, including the Foundations course for first year students, a journal club for second year Doctoral students, internship presentations, and new assignments to program committees. Some of these activities are also returning to in-person with virtual flexibilities being mindful that the Covid-19 Pandemic is still effecting our communities.

This year, we are also looking at our last round of applications! As we move into the last portion of the program, we are very focused on identifying opportunities for sustainability and building on the strong foundation we have established."

The 2022/2023 Cohort

We welcome 22 students this academic year. New students include 8 Master's and 6 Doctoral. The program also welcomes back 8 Doctoral students for their second year. Read about our trainees below!

University of Manitoba Trainees

Masters Students



Samah Ahmed (Biochemistry and Medical Genetics)

Samah's research focuses on classifying audiogram data of healthy aging participants using automated phenotyping approaches to uncover genes and pathways associated with increased risk of age-related hearing loss. This can, in turn, guide the development of treatment and preventive strategies.



Maria Shenna Fauni (Biochemistry and Medical Genetics)

Shenna's research will investigate DNA methylation markers that reflect pathophysiological changes associated with aggressive progression and poor prognosis in patients with chronic lymphocytic leukemia (CLL). Using microarray data, bioinformatic tools, and predictive analytics, she aims to test the validity of DNA methylation measures as determinants of CLL trajectory.



Saqib Islam (Computer Science)

Saqib's research revolves around Predictive Machine Learning, Computer Vision, and Interdisciplinary applications of Deep Learning in medical image processing, image registration, and longitudinal image data. He is developing predictive models to extract relevant features from thermograms (thermal imaging) to assist in the early detection of diabetic foot ulceration from thermograms and working on utilizing x-ray imaging of hands and feet of patients taken at multiple timepoints to devise a longitudinal-diagnostic model to predict disease progression of Rheumatoid Arthritis (RA) using joint space narrowing and erosion scores (sharp van heijde scores).



Jocelyn Ivette Zambrano Alvarado (Microbiology)

Jocelyn is performing a longitudinal analysis of aquatic bodies in rural Manitoba to elucidate the spatiotemporal composition of T4-like viruses, bacteria, and microeukaryotes. The waterways in this study are adjacent to urban and agricultural impacted areas. A case-control study is also being conducted to compare microbiomes in a lesser impacted forested area. In this project, direct precipitation with skimmed milk is used to concentrate microbial fractions. Taxa identification of bacteria, microeukaryotes, and T4-like viruses will be completed with deep-amplicon sequencing of 16S rRNA, 18S rRNA, and g23, respectively with Nanopore technology. Changes in α and β diversity and network analysis will also be conducted between waterways and through seasons. The main goals of Jocelyn's project are to understand the influence that contaminating activities have on the microbiome of waterways and to provide valuable information in the assessment of complementary indicators of aquatic pollution.



University
of Manitoba



NSERC
CRSNG



University
of Victoria



The VADA Program

Visual and Automated Disease Analytics
Graduate Training Program

NEWSLETTER

New Doctoral Students



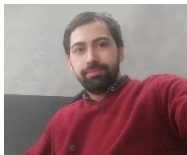
Mohd Wasif Khan (Biochemistry and Medical Genetics)

Mohd Wasif Khan is a computational biology student investigating the role of genetics and microorganisms in Early Childhood Caries (ECC). Another focus of his research is to identify the associations between taste genetics and oral microbiome in healthy individuals and ECC patients. For his research, he uses statistical techniques like meta-analysis, mediation analysis, and advanced machine learning methods. Through his research, he expects to get more insight into the pathogenesis of ECC and standardize the methods for such analyses along with appropriate visualization methods.



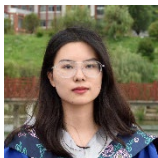
Katherine Li (Medical Microbiology and Infectious Disease)

Katherine's research focuses on the genetic diversity and antigenic variation amongst SARS-CoV-2 variants of concern (VOCs). She is analyzing the mutation patterns of high-profile VOCs such as the Omicron and Delta lineages to better understand how these relate to the emergence of new VOC lineages and their impact on host immune recognition.



Hassan Maleki Golandouz (Community Health Sciences)

Hassan's research will focus on developing models that combine multiple sources of error-prone data, such as those found at the Manitoba Centre for Health Policy (MCHP), for accurately measuring chronic health conditions and outcomes at the population level, to improve the quality of care and reduce the associated costs. The primary research question is: What factors affect the accuracy and precision of rule-based approaches, statistical model-based approaches, and machine-learning model-based approaches to develop algorithms for identifying individuals with chronic health conditions in electronic health data?



Shi Zhang (Community Health Sciences)

Shi's research will focus on developing mixed-effects modelling approaches to analyze health data with multilevel structures like the hospital stay of COVID-19 patients in Manitoba partially cross-classified by residential areas and hospitals.

Returning Doctoral Students



Taylor Davedow (Medical Microbiology and Infectious Disease)

Taylor's research is focused on the genomics of non-O1/non-O139 Vibrio cholerae and aims to characterize virulence markers and reveal phylogenetic relationships within Canada and internationally. This information could guide future surveillance, outbreak detection and response.



Muditha Bodawatte Gedara (Community Health Sciences)

Muditha's research will focus on statistical methods for Patient-Reported Outcome Measures (PROMs), which are appraisals from patients about their well-being and quality of life. I will use machine-learning methods to investigate heterogeneity in longitudinal PROMs data. I intend to develop new approaches to detect potential sources of measurement errors in longitudinal PROMs data by combining item response theory models with data-driven machine learning methods.



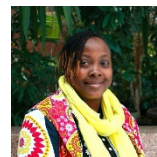
Md Ashiqul Haque (Community Health Sciences)

Ashiq's research focuses on developing model-based chronic disease risk factor (e.g., smoking, obesity) ascertainment algorithms using machine-learning models applied to administrative health data and electronic medical records.



Leann Lac (Computer Science and Statistics)

Leann's research focuses on developing and applying machine learning and statistical methods to joint longitudinal and time-to-event multimodal health data to improve final risk prediction in disease prevalence and patients' outcome.



Ruth Mwatelah (Medical Microbiology and Infectious Diseases)

Ruth's research is focused on assessing the impact of sex and behavior associated with sex work on the microbiome and immune milieu of the female genital tract of adolescent girls and young women engaging in high risk sexual behavior. This will provide additional knowledge to better understand HIV risk factors at the time of entry into sex work. You can learn more about her through her LinkedIn profile.



University
of Manitoba



NSERC
CRSNG



University
of Victoria



The VADA Program

Visual and Automated Disease Analytics
Graduate Training Program

University of Victoria Trainees

Masters Students



Henry Oluka (Health Information Science)

Henry applies his B.Sc. in Computer Science, Health Information Science and Statistics in health information technology research, which explores the use of advanced data analytics and UML modeling techniques to develop use cases and explore methodologies to support remote patient monitoring (RPM) using automated context-sensitive alert systems in smart home environments to improve remote patient care.



Dee Dee Wong (Health Information Science)

Dee Dee is interested in using machine learning techniques and data analytics to parse infectious disease data from social media.



Parisa Rahnema Naserabad (Health Information Science)

Parisa holds undergraduate degree in Medical and Health Physics and master degree in Biomedical Engineering. Her research experience in medical physics and medical imaging introduced her to medical and health data processing and analysis. She started her second master degree in Health Information Sciences at University of Victoria. Her research focuses on data extraction for automated review of radiotherapy treatment plans and modeling. This project aims to improve planning efficiency and treatment quality in radiation therapy at BC Cancer.

New Doctoral Students

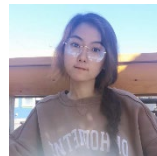


Reza Alemy (Health Information Science)

A medical doctor by education and a data scientist by trade, Reza finished his MD and attained Radiation Oncologist designation in Iran. After 12 years of practice, he immigrated to Canada where he finished his Master's degree in Health Informatics at the University of Victoria and is currently going through his PhD in the same field. His work in the past 15 years has been mostly in the development of data analysis and management frameworks for healthcare big data, including insurance, clinical, and pharmaceutical information sources. An

expert in standards such as HL7, DICOM, and NCPDP, he has used this data to create inference and prediction models for various resources.

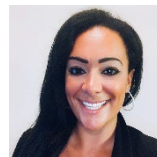
Reza holds a designation of Certified Professional in Healthcare Information and Management Systems (CPHIMS) from HIMSS, Certified Agile Professional from PMI, and Healthcare Applied Data Scientist from MIT. His main focus in the past couple of years has been Natural Language Processing of disease registries and insurance claims, signal processing of Near Infrared Spectroscopy (NIRS) in muscle oxygenation using adversarial neural networks, and location prediction using Internet of Things signal triangulation.



Kailun Bai (Mathematics and Statistics)

Kailun's research is focused on developing method and tool for single-cell RNA sequencing data analysis, especially on cell type annotation, which is a crucial step in analyzing single-cell RNA sequencing data.

Returning Doctoral Students



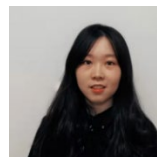
Amanda Joseph (Health Information Science)

Amanda is passionate about health system reform and the intersection of where health informatics can be utilized to create positive change in the healthcare landscape. Her research interests include process improvement in healthcare, patient safety, robotics, usability engineering and human factors (cognitive impacts of the patient, physician and caregiver journey). Specifically, her research incorporates predictive modeling, data visualizations and simulation software to contextualize the trajectory across the continuum of care and the necessity of safe and effective healthcare service delivery.



Lisa Shah (Health Information Science)

Lisa's research will focus on quantifying the electronic medical record (EMR) documentation-related burden faced by Canadian physicians. This will be followed by investigating how EMR usability improvements can decrease the cognitive load and documentation-related burden of Canadian physicians.



Yushan (Yulia) Hu (Mathematics and Statistics)

Yushan holds a Bachelor's degree in Computer Science and Technology from Northwestern Polytechnical University. Her research interests





The VADA Program

Visual and Automated Disease Analytics
Graduate Training Program

include (1) Bioinformatics, (2) Biostatistics, (3) chronic obstructive pulmonary disease, and (4) big data problems.

University of British Columbia Trainees

Masters Students



Eranga Desaa (Computer Science)

Eranga's research focuses on mitigating the adverse outcomes of anxiety in a healthcare setting by transferring relevant internal imagery to augmented and virtual reality environments.

New Faculty



The VADA Program welcomes a new faculty member, Dr. Hezhao Ji! Dr. Ji, is a senior research scientist at the National Microbiology Laboratory (NML) at the JC Wilt Infectious Diseases Research Centre, Public Health Agency of Canada. Dr. Ji is also an adjunct professor in the Department of Medical Microbiology and Infectious Diseases at the University of Manitoba since 2013. Dr. Ji obtained his medical degree in 1993, MSc. in medical immunology in 1996 and Ph.D in medical microbiology and infectious diseases in 2007. With over 29 years' extensive research experience in the relevant fields, Dr. Ji is an established researcher in genomics and genetics research on human viral diseases, particularly HIV/AIDS. Dr. Ji has been leading the NML effort in developing and implementing next generation sequencing (NGS)-based HIV drug resistance (HIVDR) genotyping technologies since 2008. Working with his WHO and PAHO counterparts, Dr. Ji has devoted tremendous efforts in promoting the implementation of NGS HIVDR testing in front-line reference labs in recent years. Besides HIVDR and HIV viral genetics, Dr. Ji's research projects also involve metagenomics, molecular epidemiology of infectious diseases and public health.

VADA Committees

The 5 VADA committees for the school year have been formed, including Internship/Lab Exchange Committee, Summer School Committee, Recruitment and Selection Committee, Research Excellence Committee, and Sustainability Committee. The committees consist of VADA faculty and second year Doctoral students. The committees are expected to meet on a bi-monthly basis. Check out the assignments below:

NEWSLETTER

Internship/Lab Exchange Committee

Faculty:

Miguel Uyaguari (Chair)

Meaghan Jones

Meghan Azad

Laura Cowen

Natalie Knox

Second Year Doctoral Students:

Ruth Mwatelah

Md Ashiqul Haque

Summer School Committee

Faculty:

Lisa Lix (Chair)

Pingzhao Hu

Julien Arino

Xuekui Zhang

Hezhao Ji

Second Year Doctoral Students:

Lisa Shah

Muditha Lakmali Bodawatte Gedara

Recruitment and Selection Committee

Faculty:

Abdul Roudsari (Chair)

Jason Leboe-McGowan

Depeng Jiang

Alex Thomo

Britt Drogemoller

Pourang Irani

Second Year Doctoral Students:

Taylor Davedow

Yulia (Yushan) Hu

Research Excellence Committee

Faculty:

Lyle Mckinnon (Chair)

Gary Van Domselaar



University
of Manitoba



NSERC
CRSNG



University
of Victoria



The VADA Program

Visual and Automated Disease Analytics
Graduate Training Program

Elizabeth Borycki
Celine Nadon
Andre Kushniruk
George Tzanetakis

Second Year Doctoral Students:

Leann Lac

Sustainability Committee (Ad hoc)

Faculty:

Alex Kuo (Chair)
Andre Kushniruk
Britt Drogemoller
George Tzanetakis

Second Year Doctoral Students:

Amanda Joseph

Foundations of Disease Analytics Course

The Foundations of Disease Analytics Course is back in person for the first time since the Covid-19 Pandemic! We have 15 students taking the course this year, and 8 returning PhD students giving presentations throughout the year about their VADA Internships.

Summer School

The 2022 Summer School took place June 20th – 24th as a hybrid event of in-person and virtual attendance. Sessions included speakers and panelists from the Public Health Agency of Canada, Digital Health Canada, various universities, and many more! Check out the summer school's program [here](#). Congratulations to: the Big Data Challenge winners, Yixiu Liu, Yichun Zhao, Hanieh Sadri, Bradley Rey, Taylor Davedow; Poster competition winners Amy Kim (Master's) and Taylor Davedow (Doctoral); and student choice poster winners Amanda Joseph (Video Presentation), Amy Kim (Poster), and Yichun Zhao (Video and Poster Combo). Many thanks to Lois Holizki and Sasha Zinovich from University of Victoria for their work in making a successful summer school! Planning for the 2023 Summer School has begun.

VADA Program Internships – Summer 2022

VADA Program students are required to complete internships that are 8 weeks long at the masters' level or 16 weeks long at the doctoral level. Students this summer were in the midst of exciting internships with a variety of hosts across Canada:

- Asif Ahmed Nelay and Yushan (Yulia) Hu – University of Saskatchewan

NEWSLETTER

- Beili Huang and Leann Lac – University of Manitoba
- Evangeline Wagner, Yichen Yan, Yichun Zhao, and Amanda Joseph – University of Victoria
- Farzana Akter – Manitoba Health
- Hanieh Sadri – Island Health
- Henry Halder – CancerCare Manitoba
- Lisa Shah – Gastroenterology Central Access and Triage; Pacific Digestive Health
- Muditha Bodawatte Gedara – Government of Manitoba
- Taylor Davedow and MacKenzie Wilke – National Microbiology Laboratory
- Viet Dao – Office of the Public Health Officer, BC Ministry of Health
- Amy Kim – Centre for Addiction and Mental Health

Trainee Presentations, Awards and Accomplishments

Muditha Lakmali Bodawatte Gedara received a PhD in Health Research Studentship Award from Research Manitoba.

Amanda Joseph attended the International Conference on Informatics, Management, and Technology in Healthcare in Greece and presented the following articles:

- Joseph AL**, Monkman H, Kushniruk AW, Borycki EM. The Utilization of Health Informatics Interventions in the COVID-19 Pandemic: A Scoping Review. *Stud Health Technol Inform.* 2022 Jun 1;163-6.
- Joseph AL**, Monkman H, Kushniruk AW. An Evaluation Guide and Decision Support Tool for Journey Maps in Healthcare and Beyond. *InAdvances in Informatics, Management and Technology in Healthcare* 2022 Jun 1 (pp. 171-174). IOS Press.
- Joseph AL**, Monkman H, MacDonald L, Kushniruk AW. Contextualizing Online Laboratory (lab) Results and Mapping the Patient Journey. *Studies in Health Technology and Informatics.* 2022 Jun 1;295:175-8.

Taylor Davedow published the following:

- Davedow T**, Carleton H, Kubota K, Palm D, Schroeder M, Gerner-Smidt P, Al-Jardani A, Chinen I, Kam KM, Smith AM, Nadon C. PulseNet International Survey on the Implementation of Whole Genome Sequencing in Low and Middle-Income Countries for Foodborne Disease Surveillance. *Foodborne Pathogens and Disease.* 2022 May 1;19(5):332-40.



University
of Manitoba



NSERC
CRSNG



University
of Victoria



The VADA Program

Visual and Automated Disease Analytics
Graduate Training Program

NEWSLETTER

Alumni Updates

Yixiu Liu published two articles:

- **Liu Y**, Jiang D. Multimorbidity Patterns in US Adults with Subjective Cognitive Decline and Their Relationship with Functional Difficulties. *Journal of Aging and Health*. 2022 Mar 24:08982643221080287.
- **Liu Y**, Jiang D, Tate R, John PS. Frequency of data collection and estimation of trajectories of physical functioning and their associations with survival in older men: analyses of longitudinal data from the Manitoba Follow-Up Study. *BMJ open*. 2022 Apr 1;12(4):e054385.

Mst Farzana Akter published two articles:

- **Akter MF**, Sathi SS, Akter A, Ullah MO. Applying an Unsupervised Machine Learning Approach to Detect Dietary Habits of Breast Cancer Patients in Bangladesh. *Journal of Scientific Research in Medical and Biological Sciences*. 2022 Mar 12;3(1):29-36.
- **Akter**, M. F., & Ullah, M. O. (2022). Awareness levels of breast cancer among female university and medical college students in Sylhet city of Bangladesh. *Cancer Reports*, e1608.

Yichun Zhao published the following:

- **Zhao Y**, Weber J. Detecting Fake Users on Social Media with a Graph Database. *The Arbutus Review*. 2021 Oct 25;12(1):49-56.

Conference Funding

Current students have \$500 of allocated funds for conference registration (including online conferences), travel expenses, and accommodation expenses available for use.

Alumni who were unable to use their allocation due to the emergence of COVID-19 are still able to access \$500 to support conference registration or travel and can contact the program coordinator (vada.program@chimb.ca) for more information.

Funding requests cannot be made retroactively. Interested students must complete the VADA Conference Funding Application form and submit for approval prior to attending/registering for conferences to secure their funding.

The VADA Program on Social Media

The VADA Program is on [Twitter](#) and [LinkedIn](#). Feel free to follow and connect with the program coordinator if there is something VADA related you feel could be shared on these platforms.

SAVE THE DATE: Last round of applications for admission to the VADA Program coming in January 2023!



University
of Manitoba



NSERC
CRSNG



University
of Victoria