The VADA Program
Visual and Automated Disease Analytics Graduate Training Program

NEWSLETTER

LETTER FROM THE VADA PROGRAM PRINCIPAL INVESTIGATOR

Welcome back to the Fall term! I hope you had a rejuvenating and relaxing summer.

We are now into our second year of the NSERC CREATE VADA Program, and I would like to highlight some of our past achievements, while sharing our vision for the upcoming one.

First off, I would like to welcome our incoming students, across both campuses, as well as new Faculty members who will be strengthening our program's offerings. I also welcome Ms. Allison Poppel our Program Coordinator. Furthermore, I wish to congratulate our first graduates, Ms. Allison Feely and Mr. Rayhan Shikder, who successfully completed all the requirements of the VADA program. Congratulations and best wishes on your journey forward!

In our first year (2017-18) we put considerable effort into setting up the necessary structures to ensure we successfully meet our objectives. We launched our course in the Fundamentals of Disease Analytics which included the participation of all our Faculty members, through seminars and assignments. Students were excited to see the various perspectives and learning approaches in this emerging field. Our committees (recruitment, internship, course development, leadership) were busy drafting mandates all while ensuring we meet our goals. Our students were all able to secure summer internships in academic and industrial settings, and we look forward to building further ties with new labs and organizations to ensure the success of our students.

Students and Faculty will attest to the great energy surrounding our summer school. It took place between July 9-13, 2018, and was hosted by the George and Fay Yee Centre for Healthcare Innovation (CHI) at the University of Manitoba. A full list of activities is provided here. Five full days was packed with seminars on professional development skills (project management, ethics, presentations) as well as technical skills in R, Python and Visual Communications. The latter culminated in a Big Data Challenge which allowed students to work in teams to mine large health data surveys, analyze and then present novel insights. Students spent many hours working on the challenge, which truly impressed us all. Students also presented their recent research outcomes through a poster session at our reception. Overall, it was a huge success and I would like to thank all those who helped, especially members from CHI.

Our upcoming year is filled with new and exciting ideas. The Foundations course has changed to focus on specific skills development. Our returning PhD students are implicated in assisting with various aspects of the program and will further develop their skills for communicating research through outreach opportunities with the greater community. We are also soon launching our web site, which will significantly aid in communicating our goals and recruit trainees down the road.

I would like to take this opportunity to thank the VADA Leadership Team and Program Team members for their participation on committees and for the various roles they take part in. I look forward to our continued partnerships and a great year ahead.

Sincerely,
Pourang Irani
VADA Program Principal Investigator

2017/18 TRAINEES
University of Manitoba
Master of Science Students

- **Marcello Nesca** (Community Health Sciences) - Marcello will be exploring existing and new tools to visualize the quality of unstructured data (such as pictures and voice recordings) in electronic health databases. The implications of data veracity (the varying quality of data) of unstructured data, impacts everyday patients from wrongly prescribed pharmaceuticals to life and death situations.
- **Kenny Hong** (Computer Science) - Kenny's research examines how we can use Augmented Reality technology such as the Hololens in order to improve procedural and analytical tasks. He is focusing on developing an algorithm to optimize the interactions between the user and the augmented digital objects against visible real world objects.
- **Viktoriya Vasylkiv** (Psychology) - Viktoriya is investigating what types of features make health-related data videos persuasive and effective in promoting health-oriented behaviours.

PhD Students (* denotes returning student)

- **Naomi Hamm** (Community Health Sciences) - Naomi's research focuses on developing and applying new methods for identifying chronic disease incidence within electronic health databases.
- **Shamsia Sobhan** (Community Health Sciences) - Shamsia's research involves developing and applying semi-competing risk models for population health risk prediction. Major objectives of her research includes developing automated covariate selection tools for high-dimensional data and addressing the effects of covariate measurement errors on semi-parametric models.
- **Mohaiminul Islam** (Computer Science) - Mohaiminul's research is highly interdisciplinary. It requires knowledge from artificial intelligence, genome science, data science, and statistical science. This research will develop transfer learning and visualization techniques using deep learning for integrating multi-omics data for precision medicine
- ***Olawale Ayilara** (Community Health Sciences) – Olawale's research involves developing and applying methods to automate the analyses of patient-reported outcomes for longitudinal data. He focuses on differential item functioning and latent variable mixture models.
- ***Ali Neshati** (Computer Science) – Ali's research will develop techniques to help individuals better understand personal health-related data collected by smartwatches.

University of Victoria
Master of Science Students

- **Matthew Parker** (Statistics) - Matthew's research focuses on abundance and prevalence estimation of open populations as they change through time. He approaches this through the application of integer time series models (such as INAR and N-Mixtures) to under-reported count data.

PhD Students (* denotes returning student)

- **Hoi Wong** (Statistics) - Hoi's research will involve developing statistical methodology and computational tools for discovering genetic variants underlying longitudinal disease progression.
- **Yan Xu** (Statistics) - Yan's thesis is about developing hierarchical models for complex genome data in the framework of Bayesian analysis and its applications in medical research, such as finding novel biomarkers and therapeutic solutions. I also intend to develop statistical software for analyzing high-throughput data
- **Eugene Opoku** (Statistics) - Eugene's research focuses on Bayesian joint-multi modal analysis, computation and predictive analysis on disease data using neural networks.
- ***Tom Arjannikov** (Computer Science) – Tom's research involves studying automatic tagging or the automatic labeling of otherwise unlabeled data with semantic tags.
- ***Abdulmonem Shennat** (Computer Science) – Abdulmonem's research involves designing and implementing algorithms to compute the dimensions of data flow.
- ***Shannon Tracey** (Social Dimensions of Health) – Shannon's research aims to investigate factors that facilitate and support the use of social media among older adults to enhance disaster resilience.

New Faculty

This year the VADA Program has welcomed three new faculty members from University of Victoria Department of Statistics. Drs. Nathoo, Zhang and Cowen bring a wealth of knowledge and experience to the program:

Dr. Farouk Nathoo – Dr. Nathoo focuses on the development of statistical methods for the analysis of neuroimaging data and imaging genetics. He also applies and develops Bayesian approaches for statistical modelling and computation. A secondary focus is the development of Bayesian methods for cognitive science and general biostatistics research.

Dr. Xuekui Zhang – Dr. Zhang's research involves developing and applying methods to analyze data generated from genomic studies. He focuses on mixture models and other machine learning algorithms. Xuekui also interested in the design of clinical trials with potential subgroup effects (i.e. for personalized medicine).

Dr. Laura Cowen - Dr. Cowen develops statistical methods to study population dynamics, particularly through the use of capture-recapture methods and applications. Her work crosses the border into disease analytics through studying elusive human populations such as people who use injection drugs and homeless populations with mental health issues.

INTERNSHIPS

"I am incredibly grateful for the opportunity to work with and learn from the highly skilled professionals in Population Health Assessment and Epidemiology at Island Health. I was able to practice and apply my skills with Tableau to automate and visualize data for the reporting on the opioid overdose crisis. My manager and team were able to identify and foster my strengths, leaving me feeling like I made a valuable contribution to their current reporting processes and capabilities." –
Shannon Tracey

This summer the VADA Program trainees were placed at host companies and laboratories to complete their internships. Internship placements were successfully completed at Population Data BC, Island Health – Vancouver Island Health Authority, the Canadian Network of Observational Drug Effect Studies, Manitoba Centre for Health Policy, and the iFLYTEK Laboratory for Neural Computing and Machine Learning at York University. Trainees worked on a specific visualization or automated analytics project for a minimum of 8 week (Master's students) or 16 weeks (PhD Students). The goals of the internships are to enable the trainees to put the professional skills they learned in the classroom into practice, to expand their technical skills in visualization and automated analytics to address real-world problems, to develop professional networks that will benefit their career development, and to foster collaborative and interdisciplinary research. For more information about hosting a VADA Program trainee, please contact the VADA Program Coordinator.

"It was extremely beneficial to our team to have Shannon placed with us for an internship. Shannon was able to bring a fresh and focused perspective and applied her skills and interest in data analysis and data visualization as well as her background in knowledge translation to immensely improve our public health surveillance and reporting capabilities."

– Maritia Gully, Manager, Population Health Assessment and Epidemiology – Island Health

VADA Program Website

After working with Bounce Design from Winnipeg, the VADA Program leadership team is happy to announce that the VADA Program will very shortly have its own website. Up to date information on trainees, faculty, publications and news and events can all be found online.

Conference Funding Opportunities

The VADA Program has funding available for trainees to attend conferences. Up to $500 annually has been allotted for eligible conference registration, travel and related expenses. For more information please contact the program coordinator.

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Upcoming Activities

Foundations of Disease Analytics Course Schedule for Term 1

Date	Instructor	Course
October 5, 2018	Dr. Lisa Lix	Types of Data – Health Registry and Administrative Data
October 19, 2018	Dr. Lisa Lix	Types of Data – Student-led activity
November 2, 2018	Dr. Lisa Lix and Patricia Roche	Internship Presentations by PhD Students Session on Creating Effective Research Abstracts, Posters, and Infographics
November 9, 2018	Dr. Rob Balshaw & Ms. Kristine Kroeker	R Software Skills
November 30, 2018	Dr. Rob Balshaw & Ms. Kristine Kroeker	R Software Skills
January 11, 2019	Dr. Lisa Lix	Internship Presentations by PhD Students Data Analysis Skills Session
February 1, 2019	Dr. Lisa Lix	Data Analysis – Student-led activity

VADA PROGRAM SUMMER SCHOOL
July 9 – 13, 2018 | Winnipeg, MB

The first summer school was attended by all VADA Program trainees; other students affiliated with the University of Manitoba also participated. The Summer School consisted of a student-led research poster session, a Big Data Challenge, and technical and professional skill development sessions. The Big Data Challenge enabled teams to tackle an automated analytic or visualization problem using a real-world dataset. Training in R and Python software packages was also offered.

Dates for the 2019 summer school are being finalized.

2019 ITCH Conference

The 2019 Information Technology and Communications in Health Conference will take place February 14-17, 2019 in Victoria, BC. The conference is being hosted by the University of Victoria School of Health Information Science and the theme will be: *From Research to Practice: Improving Usability, Safety and Patient Outcomes with Health Information Technology*. For more information visit uvic.ca/hsd/itch

APPLICATIONS FOR THE 2018/19 ACADEMIC YEAR

Applications to the VADA Program for the 2018/19 academic year will be available on the VADA Program website before the end of 2018. Applicants will be required to submit:

- a completed application form
- a curriculum vitae
- two letters of reference
- transcript(s)

Applicants must be registered or accepted to a graduate program at the University of Manitoba or University of Victoria by September 2019 and have an advisor who is part of the VADA Program team. **Applications will be due by March 1, 2019.**

FOR MORE INFORMATION:

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