NICHOLAS RICHARDSON

Research topic

Signal decomposition and source separation

Faculty

Faculty of Science

Program

Doctor of Philosophy in Mathematics (PhD)

Research supervisor(s)

Michael Friedlander

Ozgur Yilmaz

Home town

Burlington

Country

Canada

Selected Award(s)

NSERC Postgraduate Scholarships

Four Year Doctoral Fellowship (4YF)

President's Academic Excellence Initiative PhD Award

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WHY DID YOU DECIDE TO PURSUE A GRADUATE DEGREE?

There is a phrase that has been repackaged in many ways, but goes something like "The more you learn, the more you realise you don't know". After my undergraduate degree in mathematical physics, I learned there were real-world unsolved problems in areas like mathematics of music that I could use my unique skill set and passion to tackle. Beyond that, there were so many unanswered questions I felt a desire to study that the pragmatic approach would be to continue in academia in a graduate degree.

WHY DID YOU DECIDE TO STUDY AT UBC?

Having grown up outside of Toronto and completed my undergrad and master's degree at the University of Waterloo, I was ready to change the scenery and go study somewhere else. I joke that is it the farthest I could move without leaving Canada, but more truthfully it was the campus that felt "right" after visiting, in a city where you ski one day and sail the next—yes, I have done both. Another reason was that I used a technique by one of my current supervisors during my master's thesis and got to meet with them after applying to UBC. My supervisors were very enthusiastic and supportive of my work so I knew we would be a great fit.

WHAT IS IT SPECIFICALLY, THAT YOUR PROGRAM OFFERS, THAT ATTRACTED YOU?

I knew the math program at UBC could give me the freedom to research and take courses I was interested in. Being affiliated with the Institute for Applied Mathematics also meant I could easily collaborate with other departments and not get stuck in a box for my degree. I also wanted a program where I could develop my skills as a teacher because it is something I enjoy and is useful should I stay in academia.

WHAT WAS THE BEST SURPRISE ABOUT UBC OR LIFE IN VANCOUVER?

I knew the campus is big, but I have been here almost a year but still feels like I have yet to explore even half of it. Also, except when there's snow, you can get almost anywhere in Vancouver and the neighbouring cities with transit just using your student pass.

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WHAT ASPECTS OF YOUR LIFE OR CAREER BEFORE NOW HAVE BEST PREPARED YOU FOR YOUR UBC GRADUATE PROGRAM?

An easy answer would be to say that my master's degree prepared me for my PhD at UBC; which is absolutely did. But I will say that performing music has also helped me in many ways like balancing when to practice/study and when to improvise, how to work in sync as a team, and how to enjoy the moment even if there is a lot going on.

WHAT DO YOU LIKE TO DO FOR FUN OR RELAXATION?

Music is such a huge part of my life that I could not survive without it! On campus I sing with the A Cappella and Jazz clubs while off campus I enjoy going to concerts and making videos for my YouTube channel. You can also find me beatboxing at the Vancouver Beatbox Championships this year.

WHAT ADVICE DO YOU HAVE FOR NEW GRADUATE STUDENTS?

One of the main reasons you are here is to learn so take advantage of the opportunities you have to develop your knowledge, but also learn a new skill, learn a new perspective, or learn more about your peers.

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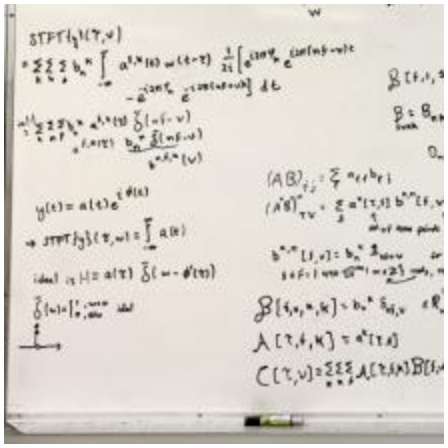

Learn more about Nicholas's research

I study the properties and methods for analysing real world signals. The applications I work on covers a variety of domains such as audio, images, and geology to name a few. I am developing new tools to study data in these fields by combining ideas from time-frequency analysis, unsupervised learning, and mathematical optimization. The main challenge is to uncover simple or important features within otherwise complicated data. More specifically, this could be isolating a singer from other musical instruments, or identifying key elements in rocks samples for classifying them.

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