

CONTACT INFORMATION

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EDUCATION

The University of British Columbia (UBC)

Vancouver, BC

MSc, Physics

Sep 2020 - Present

- Thesis Topic: Quantative MRI using Luminal Water Imaging for Clinical Prostate Cancer Detection
- Relevant Coursework: Nuclear Magnetic Resonance Imaging, Radiological Imaging, Visual Computing, Quantum Mechanics

The University of British Columbia (UBC)

Vancouver, BC

BASc, Engineering Physics, Minor in Commerce

Sep 2013 - May 2018

- Graduation with Dean's Honour List
- Relevant Coursework: Linear Circuits, Signal and systems, Systems and Control, Electronic Circuits, Digital Systems and Microcomputuers, Applied Partial Differential Equations, Variational and Approximate Methods, Optics, Electromagnetic Theory

Eidgenössische Technische Hochschule Zürich (ETHZ)

Zurich, Switzerland

Exchange Student (Mechanical and Process Engineering)

Sep 2016 - Feb 2016

- Studied graduate level courses during an exchange semester during my BASc
- Relevant Coursework: Quantitative Flow Visualization, Plasmonics, and Radiation Heat Transfer

RESEARCH

MRI Research Lab, UBC

Vancouver, BC

MSc Student advised by Dr. Piotr Kozlowski

Sep 2020 - Present

Developing computer vision algorithms for quantitative MRI analysis of prostate tissue using novel Luminal Water Imaging (LWI) technique.

- Currently writing Python and MATLAB code to analyze multiexponential T2 signal for multiparametric mapping of quantitative properties and cancer probabilities
- Implemented and tested U-NET architectures to automatically segment the prostate gland from its surrounding regions in MR T2 echo images

Nanoplasmonics Laboratory, University of Victoria

Victoria, BC

Undergraduate Researcher advised by Dr. Reuven Gordon

May 2017 - Aug 2017

Awarded an NSERC Research Award to research optical tweezing techniques for egg-white protein analysis and co-authored to two peer-reviewed publications.

- Developed MATLAB code using autocorrelation and standard deviation analyses on Brownian motion signals to characterize and identify proteins based on molecular mass
- Assisted in the design of double-nanoholes aperatures (DNH) and characterized its degradation and efficacy through SEM and protein trapping ability

RREACH Lab, UBC

Vancouver, BC

Undergraduate Researcher advised by Dr. Machiel Van der Loos

May 2016 - Aug 2016

Awarded an Undergraduate Student Research Award Fellowship for conducting clinical studies and successfully developed a pediatric "smart" mattress prototype.

- Designed, produced, and tested SleepSmartV2, the lab's first digital sensor prototype to measure temperature and motion in real time using a PIC18F4550 microcontroller programmed in C and interfaced with LabVIEW and MATLAB
- Conducted human research trials with SleepSmartV1 under the guidelines of the Research Ethics Board of Canada

Atomically Resolved Dynamics, Max Planck Institute for the Structure and Dynamics of Matter

Undergraduate Researcher advised by Dr. Wesley Robertson

Hamburg, Germany

Jan 2015 - Apr 2015

Developed software and hardware for laser and mass spectrometry research and contributed to a peer-reviewed journal publication.

- Implemented MATLAB and LabVIEW software algorithms to develop an auto-alignment system for high-throughput sampling with an achieved alignment accuracy of $3.7\mu\text{m}$

TEACHING
ASSISTANCE AT
UBC

Physics 401: Electromagnetic Theory

Spring 2021

Topics: Maxwell's Theory, Wave propagation in dielectrics, conductors and plasmas, wave guides, radiation, antennae, and special relativity

Physics 100: Introductory Physics

Fall 2020

Topics: Kinematics, force, energy, momentum, use of graphs and vectors in physics; thermal energy, heat transfer, and electricity

WORK
EXPERIENCE

Stōkō

Vancouver, BC

Engineering Physicist & Mechanical Designer

Oct 2018 - July 2020

Brought mechanical, research, and imaging expertise to design, develop, and test the Stoko K1 knee brace from prototype to production.

- Independently developed the proprietary 3D imaging system software to inform and combine biomechanics to the design of the knee brace
- Supervised two engineering interns and collaborated in designing and developing an automated test jig to determine and confirm the mechanical efficacy of the brace
- Developed and conducted pilot studies together with physiotherapists under the guidelines of Research Ethics Board of Canada

Dynamic Optics

Port Coquitlam, BC

Project Coordinator & Mechanical Engineer

Jun 2020 - Oct 2020

Managed mechanical designs, optimized optical and fluid subsystems, and coordinated among key industry stakeholders for the HyDRA optical mirror polisher project.

- Developed preliminary designs for optical metrology systems using both commercial and experimental interferometry systems
- Supervised mechanical engineering co-op students on the design of HyDRA force plates and safety systems surrounding a KUKA robot

International Student Summer Programs

Victoria, BC

Student Assistant

Summers of 2011-2013

Assisted with teaching English to Japanese students during Summer exchange programs.

Badminton Coach

Victoria, BC

Coach

2009 - 2013

Taught badminton to youths aged 7-18 for various badminton programs.

PEER-
REVIEWED
PUBLICATIONS

N. Hachohen, **C. J. X. Ip**, and R. Gordon. "Analysis of Egg White Protein Composition with Double Nanohole Optical Tweezers". *ACS Omega*. 2018, 3, 5, 5266-5272. doi.org/10.1021/acsomega.8b00651. My contributions: aided in performing analysis and manuscript writing.

N. Hachohen, **C. J. X. Ip**, G. K. Laxminarayana, T. S. DeWolfe, and R. Gordon. "Nanohole optical tweezers in heterogeneous mixture analysis". *Proc. SPIE 10347, Optical Trapping and Optical Micro-manipulation XIV 103470F*, 2017. doi.org/10.1117/12.2273358. My contributions: aided in performing analysis and manuscript writing.

W. D. Robertson, L. R. Porto, **C. J. X. Ip**, M. K. T. Nantel, F. Tellkamp, Y. Lu, and R. J. D. Miller. "Note: A simple image processing based fiducial auto-alignment method for sample registration." *Rev. Sci. Instrum.* 2015, 86. 086105. doi.org/10.1063/1.4929408. My contributions: aided in performing experiments, development of instrumentation, and manuscript writing.

HONOURS & AWARDS	Dean's Honour List	2018
	NSERC Undergraduate Student Research Award	2017
	2nd Place at UBC Senior Design Competition	2017
	Engineers in Scrubs Undergraduate Student Research Award Fellowship	2016
	Applied Science Coordinated International Exchange Award	2016
	1st Place at UBC Senior Design Competition	2015
	District Dogward Authority Award Scholarship	2013
	Carol Lobb Award (Athletics, Good Academic Standing, & Contribution to Community)	2013
	Athletic Director's Merit Award	2013
PROFESSIONAL DEVELOPMENT	DeepLearning.AI: Neural Networks and Deep Learning Course	Jun 2021
	Stanford d.School: Research as Design Pop-Out Course, attendee	May 2019
	BC Tech Summit, company representative & attendee	Mar 2019
	Laser Safety Training	May 2017
	Workplace Hazardous Materials Information System Training (WHIMIS)	May 2017
	Innovation in Health and Research Technologies Symposium, attendee	Jun 2016
	Tri-Council Policy Statement: Course on Research Ethics	May 2016
OUTREACH	The (un)Scientific Method, founding member	Dec 2020 - Present
	<i>A new female-led podcast by graduate students at UBC with the goal of increasing science literacy in out community through sharing the unique stories and research perspectives of young STEM researchers</i>	
	Physics and Astronomy Outreach, volunteer	Fall 2020 - Present
	<i>Volunteering to teach physics workshops to various audiences, including those from underrepresented demographics in STEM i.e. girls and Indigenous youth</i>	
	Women in Science, mentor	Fall 2020 - Present
	<i>Mentoring an undergraduate female student in applied science on academic and career goals</i>	
	Physics Circle, volunteer	Fall 2020 - Spring 2021
	<i>Organizing physics sessions consisting of a guest lecturer and a worksheet for interested high school students every other week</i>	
	STEM Mentoring Cafe, volunteer	Fall 2019
	<i>Participated in mentoring events as part of Open Science Network for high school students to discuss with STEM professionals and learn about various scientific fields</i>	
	Shad International, project mentor	July 2019
	<i>Mentored a diverse team of high school students involved in the Shad Program on a project about solving problems in food security, water management, and waste</i>	
	VEX & First Robotics, volunteer	Spring 2018 - Spring 2019
	<i>Volunteered as a robotics judge for several high school VEX and FIRST Robotics competitions</i>	
	Engineering Physics Student Association, graduate representative	Sep 2017 - May 2018
	<i>Organized and supported the graduating class of Engineering Physics to meet graduation requirements and raised funds to for professional development events</i>	
	Engineering Physics Student Mentorship Program, mentor	Sep 2017 - May 2018
	<i>Mentored a group of younger Engineering Physics students and coordinated weekly activities and events</i>	

	Engineering Physics Student Association, events coordinator <i>Organized and raised funds through sponsorships from the university and private companies for successful networking and social events for students, faculty, and alumni</i>	Sep 2015 - May 2017
	St. Michael's Outdoor Leadership Program, leader <i>Guided several outdoor trips for high school students, such as a five-day sea kayaking trip around the Gulf Islands</i>	Sep 2011 - Jun 2013
TECHNICAL PROJECTS	Optics Experiments <i>Conducted experiments for an optics course: characterization of the HeNe Laser spectrum and mode-control, understanding Fourier optics, and building a Michelson Interferometer</i>	Spring 2018
	Experimental Physics <i>Conducted and reported on experiments for an experimental physics course: NMR pulse sequencing, measuring material properties through acoustic impedance, and analysis of samples using gamma ray spectroscopy</i>	Fall 2017
	Electrical Impedance Tomography <i>Implemented a solution to an inverse problem in MATLAB to image anomalies within a region given its boundary measurements for an applied maths course (github)</i>	Fall 2017
	Senior Design Engineering Robot Competitions <i>Developed autonomous robots for various university competitions (github)</i>	Fall 2015 - Fall 2017
	Simulating Radiative Heat Transfer <i>Implemented Monte-Carlo Methods in MATLAB to solve net energy transfers of varying surfaces and compared solutions to the analytical "Radiosity" method</i>	Fall 2016
	UBC Formula Electric, Student Team <i>Developed PCB circuitry and 3D printed waterproof casing for the Tractive System Active Light and designed braking disks and hydraulics for the braking system</i>	Fall 2014 - Fall 2016
	Autonomous Robot for Object Retrieval <i>Designed, prototyped, and developed a fully autonomous robot in a team of four with my focuses on software and electrical systems (website)</i>	Fall 2014 - Fall 2016
	UBC Orbit, Student Team <i>Designed a vacuum system components and researched satellite payload mechanisms</i>	Fall 2014 - Fall 2016
INTERESTS	Played badminton for 14+ years, ranking top in Canada for Women's Doubles and Mixed Doubles and invited to the Junior Pan American Games in 2007 in Guatemala. Enjoys photography (recently into black and white film), ice cream recipe development, and the outdoors for hiking.	