

EDUCATION

MD/PhD (Biomedical Engineering) **University of British Columbia** **2018 - Present**

Dissertation: Intelligent Renal Ultrasound: Multiparametric Ultrasound Imaging for Chronic Kidney Disease

Supervisors: Prof. Robert Rohling & Dr. Christopher Ngan

MASc (Biomedical Engineering) **University of British Columbia** **2015 –2017**

Dissertation: Intra-operative Ultrasound-based Augmented Reality for Laparoscopic Surgical Guidance

Supervisor: Prof. Robert Rohling

BASc (Computer Engineering) **University of British Columbia** **2010 –2015**

Ranked top 5 in department; graduated with Distinction and Co-operative Education program.

Specialization: Software Engineering. *CGPA:* 4.0

PROFESSIONAL EXPERIENCE

Research Engineer **University of British Columbia** **2018**

- Developed an iOS app to record and quantify laboring women's shivering. Released as "BCW Shivering App".
- Used state-of-the-art neural networks to detect kidney stones, achieving a mean precision of 0.70 ± 0.10 .
- Developed two HoloLens prototype applications (3D spine modelling and a simulated operating room) in Unity
- Mentored a Master's student in ultrasound image processing and experiment design for placenta segmentation
- Coordinated 12 projects with 3 hospital departments (Urology, Anesthesia, and Maternal/Fetal Medicine).
- Led the writing of 5 grants, receiving \$135,000 over two years.

Co-Founder **92 Medical** **2017 – 2018**

- Founded a venture that focused on ultrasound navigation guidance for epidural and facet joint injections for anesthesiology.
- Accepted into entrepreneurship@UBC's accelerator program
- Developed a needle guide for neuraxial anesthesia, achieving a 95% success rate and accuracy of 3.6 mm.
- Led the pre-clinical and feasibility validation, business development (incl. customer discovery and market research), and product development.

Graduate Research Assistant **University of British Columbia** **2015 – 2017**

- Led development on 3 ultrasound-based augmented reality systems for kidney cancer surgery, using C++, OpenCV and OpenGL, achieving a 50% improvement in healthy tissue removed in mock surgeries.
- Collaborated with industry and international academic groups (Northern Digital Inc & Imperial College London).

Undergraduate Research Assistant **University of British Columbia** **2014– 2015**

- Software development for using a mini-projector and ultrasound probe with a surgical robot in order to enhance the surgical view during kidney cancer surgeries. In collaboration with Imperial College London.
- Developed computer programs to perform computer visions tasks including stereo correspondence, image noise filtering, feature detection and tracking and camera calibration.

Software Development Intern **Safe Software** **2013, 2015**

- Implemented a re-design of C++ modules for with 5 different database formats to improve user experience.

Software Developer Co-op	NetApp Inc.	2012
<ul style="list-style-type: none"> Enhanced the functionality of a Perl daemon and fixed defects in ONTAP, a data management operating system 		

TEACHING EXPERIENCE

1. <i>Near Peer Tutors Coordinator</i> – created a pilot project with senior students teaching junior students in gross anatomy and neuroanatomy labs in undergraduate medical education	2019 - Present
2. <i>Session Facilitator</i> – organized and ran a province-wide student-led session on physical activity as part of the undergraduate medical curriculum	2019
3. <i>Instructional Skills Workshop</i> – workshop on effective instructional and teaching skills	2016
4. <i>Graduate Teaching Assistant</i> – EECE 542 Computer-integrated Surgery and ELEC 442 Introduction to Robotics	2016
5. <i>Undergraduate Teaching Assistant</i> – CPSC 261 Basics of Comp. Systems; CPSC 259 Data Structures and Algorithms for Elec. Eng.; CPSC 260 Data Structures and Algorithms for Comp. Eng.	2013-2015

ACADEMIC SERVICE

1. <i>Reviewer</i> . Augmented Environments for Computer Assisted Interventions (AE-CAI) Workshop at MICCAI	2020
1. <i>Reviewer</i> . Conf. on Neural information Processing Systems	2020
2. <i>Reviewer</i> . Intl Conf. on Medical Image Computing and Computer-assisted Interventions (MICCAI)	2020
2. <i>Reviewer</i> . Assoc. for Computing Machinery Conf. on Health, Inference and Learning (CHIL)	2020
3. <i>Reviewer</i> . Intl. Journal for Computer Assisted Radiology and Surgery (IJCARS)	2018, 2020
4. <i>Reviewer</i> . Machine Learning for Health (ML4H) Workshop at NeurIPS 2019.	2019
5. <i>Reviewer</i> . Joint MIAR/AE-CAI/CARE Workshop at MICCAI 2019.	2019
6. <i>Session Moderator</i> . Faculty of Medicine Research Trainee Day.	2019
7. <i>Reviewer</i> . Intl. Information Processing for Computer-Assisted Interventions Conf. (IPCAI)	2018

HONORS, AWARDS, AND ACHIEVEMENTS

1. <i>Vanier Canada Graduate Scholarship</i> , NSERC – ranked 1 st nationally (\$50,000/year x 3)	2020
2. <i>Four Year Fellowship</i> , University of British Columbia (\$18,200/year x 4, in title only)	2020
3. <i>Nominee for President's Student Leader Recognition Event</i> , University of British Columbia	2020
4. <i>BC MEDTECH Graduate Award</i> , School of Biomedical Engineering (\$1,450)	2019
5. <i>Excellent Reviewer Recognition (top 5%)</i> , ML4H Workshop at NeurIPS	2019
6. <i>Graduate Support Initiative</i> , School of Biomedical Engineering (\$4,000)	2019
7. <i>Graduate Award</i> , UBC Faculty of Medicine (\$7,800)	2019
8. <i>Clinician Investigator Scholarship</i> , UBC Faculty of Medicine (\$26,000)	2019
9. <i>2nd Place Best Poster Award</i> , Western Section of American Urology Association	2018
10. <i>Best Paper Award</i> , Augmented Environments for Computer Assisted Interventions (\$250)	2017
11. <i>Best Paper Award</i> , 11 th Annual Lorne D. Sullivan Urology Research Day (\$250)	2017
12. <i>Graduate Student Initiative Award</i> , University of British Columbia (\$500)	2017
13. <i>Rising Star Award</i> , University of British Columbia Faculty of Applied Science	2017
14. <i>Faces of Today Recipient</i> , University of British Columbia Student Leadership Conference	2017
15. <i>Engineers in Scrubs Travel Grant</i> , University of British Columbia (\$1000)	2016
16. <i>First Place</i> , Rick Hansen Access Innovation Challenge	2016
17. <i>Finalist, Award for Excellence in BME Innovation</i> , Medical Device Development Centre	2015

11. <i>Engineers in Scrubs Research Fellowship</i> , University of British Columbia (\$18,000)	2015
12. <i>Alexander Graham Bell Canada Graduate Scholarship</i> , NSERC (\$17,500)	2015
13. <i>Dean's Honour List</i> , University of British Columbia	2011- 2015
14. <i>Margaret E. Barr Bigelow Memorial Scholarship</i> , University of British Columbia (\$400)	2015
15. <i>Trek Excellence Scholarship</i> , University of British Columbia (\$750)	2014
16. <i>Undergraduate Student Research Award</i> , NSERC (\$4,500)	2014
17. <i>Thomas Beeching Scholarship</i> , University of British Columbia (\$500)	2014
18. <i>T.E and M.E. Ladner Memorial Scholarship</i> , University of British Columbia (\$950)	2014
19. <i>Top 20 in Canada</i> , IEEE 24-Hour Programming Competition	2012
20. <i>Academic Scholarship</i> , Belmont Connect Trade (\$4,000)	2012
21. <i>Engineering Entrance Scholarship</i> , Association of Engineers and Geoscientists BC (\$2,500)	2010
22. <i>Senior Award of Excellence</i> , South Delta Secondary School	2010
23. <i>President's Entrance Scholarship</i> , University of British Columbia (\$2,500)	2010
24. <i>Education Award for Outstanding School and Community Involvement</i> , Envision Financial (\$2,000)	2010

PUBLICATIONS AND PRESENTATIONS

Peer Reviewed Journal Publications

1. Singla R, Burlinson C, Honigmann S, Abolmaesumi P, Chau A, Rohling R. Interdisciplinary Development and Evaluation of a Novel Needle Guide For Ultrasound-Guided Lumbar Epidural Placement. *BMJ Innovations*. In press.
2. Hu R, Singla R, Deeba F, Rohling R. Acoustic Shadow Detection: Study and Statistics of B-Mode and Radiofrequency Data. *Ultrasound in Medicine and Biology*. 2019 Aug 1;45(8):2248-57.
3. Harriman DI, Singla R, Nguan C. The Resident Report Card: A Tool for Operative Feedback and Evaluation of Technical Skills. *The Journal of Surgical Research*. 2019 Jul 1;239:261-8.
4. Edgcumbe P, Singla R, Pratt P, Schneider C, Nguan C, Rohling R. Follow the light: projector-based augmented reality intracorporeal system for laparoscopic surgery. *Journal of Medical Imaging*. 2018 Feb;5(2):021216.
5. Singla R, Edgcumbe P, Pratt P, Nguan C, Rohling R. Intra-operative ultrasound-based augmented reality guidance for laparoscopic surgery. *Healthcare technology letters*. 2017 Nov 16;4(5):204-9.

Peer-Reviewed Conference Publications (with Oral Presentations)

1. Hu R, Singla R, Yan R, Mayer C, Rohling R. Acoustic Placenta Segmentation with a Convolutional Neural Network Weighted by Acoustic Shadow Detection. In *2019 41st Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBS)* 2019 Jul 23 (pp.6718-6723). IEEE. Berlin, Germany.
2. Honigmann S*, Zhu YC, Singla R, Abolmaesumi P, Chau A, Rohling R. EpiGuide 2D: visibility assessment of a novel multi-channel out-of-plane needle guide for 2D point of care ultrasound. In *SPIE Medical Imaging 2019: Image-guided Procedures, Robotic Interventions and Modelling* 2019 Mar 8 (Vol. 10951, p. 109510K.) International Society for Optics and Photonics. San Diego, USA.
3. Singla R, Edgcumbe P, Pratt P, Nguan C, Rohling R. Intra-operative ultrasound-based augmented reality guidance for laparoscopic surgery. *12th Annual Augmented Environments for Computer-Assisted Interventions (AE-CAI)*. 2017 Sep. Quebec City, Canada.
4. Edgcumbe P*, Singla R†, Pratt P, Schneider C, Nguan C, Rohling R. Augmented reality imaging for robot-assisted partial nephrectomy surgery. In *International Conference on Medical Imaging and Virtual Reality*. 2016 Aug 24. (pp.139-150). Bern, Switzerland.

Conference Abstracts (with Oral Presentations)

*S. Honigmann received the "Image-Guided Procedures, Robotic Interventions, and Modeling Student Paper Award" as an outstanding paper in the area of surgical robotics and related topics

† Indicates equal contribution

1. Burden L, Spooner L, **Singla R**, Khehra K, Cho A, Nguan C. PatientLink: A Novel Application to Address Stress and Anxiety in Patient Supporters During Surgical Operations. *Northwest Urological Society's 66th Annual Conference*. 2020. Vancouver, Canada.
2. Khehra K, Stewart C, Cho A, **Singla R**, Nguan C. Patient Reported Outcomes From Renal Transplant Recipients: Initial Results From A Single Centre Study. *Northwest Urological Society's 66th Annual Conference*. 2020. Vancouver, Canada.
3. **Singla R**, Lundeen C, Forbes C, Hogarth D, Nguan C. Fluoroscopic targeting of renal calculi during extracorporeal shockwave lithotripsy using a machine learning algorithm. *American Urological Association*. 2019. Chicago, USA.
4. Dawidek M, **Singla R**, Cho A, Ho L, Nguan C. Pilot: Clinical Comparison of An Audio-based Uroflowmetry App Against Conventional Uroflowmetry in Adults. *UBC Urology 13th Annual Lorne D. Sullivan Research Day*. 2019. Vancouver, Canada.
5. **Singla R**, Lundeen C, Forbes C, Hogarth D, Nguan C. Update on renal calculus targeting using machine learning for extracorporeal shockwave lithotripsy. *UBC Urology 13th Annual Lorne D. Sullivan Research Day* 2019. Vancouver, Canada.
6. **Singla R**, Forbes C, Lundeen C, Nguan C. Automatic renal calculi localization in fluoroscopy for extracorporeal shockwave lithotripsy. *UBC Urology 12th Annual Lorne D. Sullivan Research Day*. 2018. Vancouver, Canada.
7. **Singla R**, Rohling R, Nguan C. HoloSurgeon: towards an augmented reality enhanced surgical warm-up method. *UBC Urology 12th Annual Lorne D. Sullivan Research Day*. 2018. Vancouver, Canada.
8. Schneider C, **Singla R**, Hetherington J, Forbes C, Tang S, Lan J, Rohling R, Nguan C. Quantitative measurement of Tacrolimus-induced tremor in renal transplant recipients: a prospective feasibility study. *UBC Urology 12th Annual Lorne D. Sullivan Research Day*. 2018. Vancouver, Canada.
9. Burlinson C, **Singla R**, Honigsmann S, Abolmaesumi P, Rohling R, Chau A. Single-operator, real-time ultrasound-guided neuraxial anaesthesia using a novel needle guide and 2D ultrasound. *European Society of Regional Anaesthesia and Pain Therapy*. 2018. Dublin, Ireland.
10. **Singla R**, Edgcumbe P, Pratt P, Nguan C, Rohling R. Intuitive Intraoperative Ultrasound-based Augmented Reality for Robot-Assisted Laparoscopic Surgery. *UBC Urology 11th Annual Lorne D. Sullivan Research Day*. 2017. Vancouver, Canada.

Conference Abstracts (with Poster Presentations)

1. Burden L, Spooner L, **Singla R**, Khehra K, Cho A, Nguan C. PatientLink: a novel application to address stress and anxiety in patient supporters during surgical operation. Canadian Urological Association Conference. 2020. Victoria, Canada.
2. Davey C, Lyman K, **Singla R**, Harriman D, Nguan C. "Baseline Measurements of Physical Function and Frailty in Pre-Transplantation End Stage Renal Disease Patient". Canadian Urological Association Conference. 2020. Victoria, Canada.
3. Dawidek M, **Singla R**, Spooner L, Nguan C. Clinical Validation of an Audio-based Uroflowmetry App in Adult Males. Canadian Urological Association Conference. 2020. Victoria, B.C.
4. Khehra K, Stewart C, Cho A, **Singla R**, Nguan C. Patient reported outcomes from renal transplant recipients: initial results from a single centre study. Canadian Urological Association Conference. 2020. Victoria, B.C.
5. Burden L, Spooner L, **Singla R**, Khehra K, Cho A, Nguan C. PatientLink: A Novel Application to Address Stress and Anxiety in Patient Supporters During Surgical Operations. *Quality Forum 2020: Shaping Success Together*. 2020. Vancouver, Canada.
6. Khehra K, Stewart C, Cho A, **Singla R**, Nguan C. Patient Reported Outcomes From Renal Transplant Recipients: Initial Results From A Single Centre Study. *Quality Forum 2020: Shaping Success Together*. 2020. Vancouver, Canada.
7. Philips D, Gill D, **Singla R**, Spooner L, Tang S, Nguan C. A Novel Device to Monitor Gross Hematuria After Urologic Surgery. *Quality Forum 2020: Shaping Success Together*. 2020. Vancouver, Canada.

8. Khehra K, Stewart C, Cho A, **Singla R**, Nguan C. Patient Reported Outcomes in Renal Transplant Recipients and Donors Over One Year: A Single Institution Experience. *Western Section of American Urological Association*. 2019. Monterey, USA.
9. Schneider C, **Singla R**, Forbes C, Hetherington J, Cho A, Tang S, Rastin T, Hoyda T, Lan J, Nguan C. Quantitative Measurement of Tacrolimus-induced Tremor in Renal Transplant Recipients: A Prospective Feasibility Study. *Western Section of American Urological Association*. 2019. Monterey, USA.
10. Voznyuk S, Mehdi H, **Singla R**, Rohling R, Gill M, Nguan C. An Interdisciplinary Approach to Preventing Retained Surgical Items with the Use of Augmented Reality. *Collaborating Across Borders VII Conference: Crossroads of Collaboration*. 2019. Indianapolis, USA.
11. Burden L, Khehra K, **Singla R**, Cho A, Nguan C. Surveying Sources of Anxiety in Family and Friends of Patients Undergoing Surgical Operations. *UBC Urology 13th Annual Lorne D. Sullivan Research Day*. 2019. Vancouver, Canada.
12. **Singla R**, Forbes C, Lundeen C, Nguan C. Renal calculus targeting using machine learning for extracorporeal shockwave lithotripsy (ESWL). *Western Section of American Urology Association*. 2018. Monterey, USA.
13. Burlinson C, **Singla R**, Honigsmann S, Hetherington J, Abolmaesumi P, Rohling R, Chau A. Feasibility of 2D ultrasound guided, real-time, single operator, midline lumbar epidural placement using a novel needle guide. *Society of Obstetric Anesthesiology and Perinatology*. 2018. Miami, USA.
14. Collins J, Gunka V, Taylor J, **Singla R**, Rohling R, Massey S. Assessment of shivering with a smartphone application in parturients undergoing cesarean delivery under epidural anesthesia. *Society of Obstetric Anesthesiology and Perinatology*. 2018. Miami, USA.

PATENTS

1. Rohling R, **Singla R**, Honigsmann S, Burlinson C, Hetherington J, Abolmaesumi P. *Apparatus, System, and Methods for Imaging a Medical Device in the Body*. US Provisional Patent No.: 62/666,260. Percentage: 15%.

INVITED PRESENTATIONS

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| 1. "Ultrasound for Chronic Kidney Disease", Island Medical Lunch Seminar, Victoria, BC | 2019 |
| 2. "The Future of Anesthesiology", Anesthesiology Resident Rounds, Vancouver, BC | 2017 |
| 3. "The Evolution of Laparoscopic Surgery", IHI Health Innovation for All, Vancouver, BC | 2017 |
| 4. "Introduction to Ultrasound Imaging", EECE 544 Medical Imaging, UBC, Vancouver, BC | 2016 |
| 5. "Introduction to Robotic Surgery", BMEG 500 Orientation to the Clinical Environment, UBC | 2016 |

VOLUNTEER EXPERIENCE

Founder	UBC AI in Medicine Club	2019 – Present
Collaborating on a national policy paper for artificial intelligence (AI) education promotion for the Canadian Federation of Medical Students		
Created a series of hands-on educational workshops for non-technical medical students to learn and experience AI as applied to medical imaging.		
Created a club focused on improving awareness of and exposure to AI technology within healthcare for medical trainees given the increasing prevalence of AI.		

Student Affairs Representative	University of British Columbia	2018 – Present
Organized and hosted two student panels for first and second years addressing clerkship concerns and transitions to distributed sites with a total attendance of 50+ students		
Student advocate for medical student well-being and support in conjunction with faculty and staff, acting as a point-of-contact for questions and concerns related to the MD program or otherwise.		

Section Editor, Reviews	UBC Medical Journal	2018 - Present
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Responsible for facilitating the peer review process of student articles, eliciting faculty member reviews, and providing prompt and succinct revision requests to authors.

Vice President, Island Medical **University of British Columbia** **2018 - 2019**
Elected class representative for a cohort of 32 medical students in the Island Medical Program.
Introduced and trialed Piazza, a modern online discussion forum, as an educational tool for the MD program.

Co-Director **Hatching Health** **2016 - 2017**
Led a team of 6 in logistics and execution of a 135-person medical technology hackathon, while fundraising \$25,000 to run the 3-day event.

Founder, Coordinator and Mentor **UBC Biomedical Eng. Connections** **2016 – 2017**
Started a paired-student mentorship initiative to connect 27 undergraduate, new graduates and current graduate students together to promote a sense of community and support incoming students' queries.

Treasurer, Radio Host, Contributor **Sharing Science Radio** **2015 – 2017**
Organized a bi-weekly science-themed radio show with news and interviews intended for the layperson. Select topics include medical imaging, salmon, deep sea exploration, and science education research.

Co-Founder and President **UBC Technology in Medicine Club** **2014 –2015**
Led the club in facilitating 3 hands-on laparoscopic surgery workshops and med-tech seminars to educate medical and engineering students. Topics included: evolution of surgical technology, medical device collaboration, and e-Health technologies.

Software Lead **UBC Orbit** **2013 - 2014**
Led a team of 4 developers to create software for a nano-satellite as part of the Canadian Satellite Design Challenge, a nation-wide competition.

Assistant Coach **South Delta Varsity Football Club** **2010 –2015**
Led and taught over 80 teenagers on the techniques and game of American football on a weekly basis, leading to over 18 students receiving university scholarships.

Student Ambassador **UBC Biomedical Engineering Program** **2016 –2017**
Engaged prospective UBC students through one-on-one conversations, lab and facility tours, and school fairs.

Representative **University of British Columbia** **2014 –2016**
Represented the Department of Electrical and Computer Engineering and the Faculty of Applied Science at various mentorship and student recruitment events. Featured in the Department's promotional video.

Engineering Liaison **Global Health Conference @ UBC** **2015 –2015**
Raised \$3000 towards the operating budget of the conference through sponsorship package creation and engagement with academic groups.

MEMBERSHIPS AND AFFILIATIONS

<i>Student Member</i> , Victoria Interdisciplinary Collaboration in Emergency Medicine (VIC-EM)	Present
<i>Member</i> , Artificial Intelligence in British Columbia (AInBC)	2019 – Present
<i>Student Member</i> , Clinician Investigator Trainee Association of Canada	2019 – Present
<i>Student Member</i> , Canadian Point of Care Ultrasound Society	2019 – Present
<i>Student Member</i> , American Society of Nephrology	2019 – Present

Student Member, Canadian Medical Association
Student Member, Doctors of British Columbia
Student Member, Diabetes Canada
Student Member, Society of Obstetricians and Gynaecologists of Canada

2018 – Present
2018 – Present
2019 - 2020
2018 - 2019