

## EDUCATION

<b>Doctor of Medicine</b>	<b>University of British Columbia</b>	<b>2018 - Present</b>
<b>M.A.Sc., Biomedical Engineering</b>	<b>University of British Columbia</b>	<b>2015 –2017</b>
<i>Dissertation:</i> Intra-operative Ultrasound-based Augmented Reality for Laparoscopic Surgical Guidance		
<i>Supervisor:</i> Prof. Robert Rohling		
<i>Specialization:</i> Engineers in Scrubs Option		
<b>B.A.Sc., Computer Engineering</b>	<b>University of British Columbia</b>	<b>2010 –2015</b>
<i>Specialization:</i> Software Engineering Option		
Ranked top 5 in department; graduated with Distinction and Co-operative Education program.		

## HONORS, AWARDS, AND ACHIEVEMENTS

1. <i>2<sup>nd</sup> Place Best Poster Award</i> , Western Section of American Urology Association	<b>2018</b>
2. <i>Best Paper Award</i> , Augmented Environments for Computer Assisted Interventions	<b>2017</b>
3. <i>Best Paper Award</i> , 11 <sup>th</sup> Annual Lorne D. Sullivan Urology Research Day	<b>2017</b>
4. <i>Graduate Student Initiative Award</i> , University of British Columbia	<b>2017</b>
5. <i>Rising Star Award</i> , University of British Columbia Faculty of Applied Science	<b>2017</b>
6. <i>Faces of Today Recipient</i> , University of British Columbia Student Leadership Conference	<b>2017</b>
7. <i>Engineers in Scrubs Travel Grant</i> , University of British Columbia	<b>2016</b>
8. <i>First Place</i> , Rick Hansen Access Innovation Challenge	<b>2016</b>
9. <i>Finalist, Award for Excellence in BME Innovation</i> , Medical Device Development Centre	<b>2015</b>
9. <i>Engineers in Scrubs Research Fellowship</i> , University of British Columbia	<b>2015</b>
10. <i>Alexander Graham Bell Canada Graduate Scholarship Recipient</i> , NSERC	<b>2015</b>
11. <i>Dean's Honour List</i> , University of British Columbia	<b>2011-2015</b>
12. <i>Margaret E. Barr Bigelow Memorial Scholarship</i> , University of British Columbia	<b>2015</b>
13. <i>Trek Excellence Scholarship</i> , University of British Columbia	<b>2014</b>
14. <i>Undergraduate Student Research Award</i> , NSERC	<b>2014</b>
15. <i>Thomas Beeching Scholarship</i> , University of British Columbia	<b>2014</b>
16. <i>T.E and M.E. Ladner Memorial Scholarship</i> , University of British Columbia	<b>2014</b>
17. <i>Top 20 in Canada</i> , IEEE 24-Hour Programming Competition	<b>2012</b>
18. <i>Academic Scholarship</i> , Belmont Connect Trade	<b>2012</b>
19. <i>Engineering Entrance Scholarship</i> , Association of Engineers and Geoscientists BC	<b>2010</b>
20. <i>Senior Award of Excellence</i> , South Delta Secondary School	<b>2010</b>
21. <i>President's Entrance Scholarship</i> , University of British Columbia	<b>2010</b>
22. <i>Education Award for Outstanding School and Community Involvement</i> , Envision Financial	<b>2010</b>

## PROFESSIONAL EXPERIENCE

<b>Research Engineer</b>	<b>University of British Columbia</b>	<b>2018</b>
Developed an iOS app to record and quantify laboring women's shivering, showing positive correlation against clinician assessment. Released on the app store as "BCW Shivering App".		
Used state-of-the-art neural networks to detect kidney stones, achieving a mean precision of $0.70 \pm 0.10$ .		
Developed two HoloLens prototype applications (3D spine modelling and a simulated operating room) in Unity		
Developed and evaluated a needle guide, achieving a 95% success rate and accuracy to within 3.6 mm.		
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.		

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| <b>Co-Founder</b>  | <b>92 Medical</b>                     | <b>2017 – 2018</b> |
| <p>Founded 92 Medical, a venture that aims to remove the guesswork from epidural and facet joint injections for anesthesiology. Accepted into entrepreneurship@UBC's accelerator program.</p> <p>Led the pre-clinical and feasibility validation, business development (incl. customer discovery and market research), and product development.</p>  |                                       |                    |
| <b>Graduate Research Assistant</b>   | <b>University of British Columbia</b> | <b>2015 – 2017</b> |
| <p>Led development on 2 augmented reality systems for kidney cancer surgery, using C++, OpenCV and OpenGL, achieving a 50% improvement in healthy tissue removed in mock surgeries.</p> <p>Collaborated with industry and international academic groups (Northern Digital Inc., Imperial College London).</p>  |                                       |                    |
| <b>Software Development Intern</b>   | <b>Safe Software</b>                  | <b>2013, 2015</b>  |
| <p>Implemented a re-design of C++ modules interfacing with databases in adherence to a design specification as to improve user experience. Formats: PostgreSQL, PostGIS, Redshift, Oracle Object-Relational and Spatial.</p>   |                                       |                    |
| <b>Undergraduate Research Assistant</b>  | <b>University of British Columbia</b> | <b>2014 – 2015</b> |
| <p>Development of software for the use of a miniaturized projector and ultrasound with a surgical robot to enhance the surgeon's view during partial nephrectomies. In collaboration with Imperial College London.</p> <p>Developed computer programs to perform computer visions tasks including stereo correspondence, image noise filtering, feature detection and tracking and camera calibration.</p> |                                       |                    |

## **PUBLICATIONS AND PRESENTATIONS**

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### **Works Submitted**

1. Singla R, Burlinson C, Honigmann S, Abolmaesumi P, Chau A, Rohling R. Accuracy of a Novel Needle Guide Design for Single Operator, Real-time Two-Dimensional Ultrasound-Guided Lumbar Intervertebral Needle Placement. *Ultrasound in Medicine and Biology*. 2018. [in submission].
2. Hu R, Singla R, Deebe F, Rohling R. Acoustic Shadow Detection: Study and Statistics of B-Mode and Radiofrequency Data. *Ultrasound in Medicine and Biology*. 2018. [in submission].
3. Harriman DI, Singla R, Ngan C. The Resident Report Card: A Tool for Operative Feedback and Evaluation of Technical Skills. *The Journal of Surgical Research*. 2018. [in submission]

### **Peer Reviewed**

4. 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. *SPIE Medical Imaging*. 2019. [in print][oral].<sup>1</sup>
5. Burlinson C, Singla R, Honigmann 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. [abstract][oral]
6. Burlinson C, Singla R, Honigmann 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. [abstract][poster]
7. 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. [abstract][poster]
8. Edgcumbe P, Singla R, Pratt P, Schneider C, Ngan C, Rohling R. Follow the light: projector-based augmented reality intracorporeal system for laparoscopic surgery. *Journal of Medical Imaging*. 2018 Feb;5(2):021216. [publication][featured]

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<sup>1</sup>Simon Honigmann received the “Image-Guided Procedures, Robotic Interventions, and Modeling Student Paper Award”, recognizing it as an outstanding paper in the area of surgical robotics and related topics

9. Singla R, Edgcumbe P, Pratt P, Nguan C, Rohling R. Intra-operative ultrasound-based augmented reality guidance for laparoscopic surgery. *Healthcare technology letters*. 2017 Oct;4(5):204. [publication]
10. Singla R, Edgcumbe P, Pratt P, Nguan C, Rohling R. Intra-operative ultrasound-based augmented reality guidance for laparoscopic surgery. *12<sup>th</sup> Annual Augmented Environments for Computer-Assisted Interventions (AE-CAI)*. 2017. [oral].
11. Edgcumbe P, Singla R, Pratt P, Schneider C, Nguan C, Rohling R. Augmented reality imaging for robot-assisted partial nephrectomy surgery. *International Conference on Medical Imaging and Virtual Reality*. 2016 Aug. [publication][oral]

### Non-Peer Reviewed

12. Khehra K, Singla R, Cho A, Nguan C. Patient Reported Outcomes (PROs) from Renal Transplant Donors and Recipients: Initial Results from Single Centre. *UBC Life Sciences Research Night*. 2018. [poster]
13. 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. [abstract][poster]
14. 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 12<sup>th</sup> Annual Lorne D. Sullivan Research Day*. 2018. [abstract][oral].
15. Singla R, Forbes C, Lundeen C, Nguan C. Automatic renal calculi localization in fluoroscopy for extracorporeal shockwave lithotripsy. *UBC Urology 12<sup>th</sup> Annual Lorne D. Sullivan Research Day*. 2018. [abstract][oral]
16. Singla R, Rohling R, Nguan C. HoloSurgeon: towards an augmented reality enhanced surgical warm-up method. *UBC Urology 12<sup>th</sup> Annual Lorne D. Sullivan Research Day*. 2018. [abstract][oral]
17. Singla R, Edgcumbe P, Pratt P, Nguan C, Rohling R. Intuitive Intraoperative Ultrasound-based Augmented Reality For Robot-Assisted Laparoscopic Surgery. *UBC Urology 11<sup>th</sup> Annual Lorne D. Sullivan Research Day*. 2017. [abstract][oral]
18. Singla R, Hetherington J, Spiedel J, Arranguantei JPG, Nickmanesh R. Portable Video Goggles for Diagnosing Nystagmus. *Innovation in Health and Research Technologies Symposium*. 2016. [poster]

### PATENTS

1. Rohling R, Singla R, Honigmann 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.

### INVITED PRESENTATIONS

1. "The Future of Anesthesiology", Anesthesiology Resident Rounds at BC Women's Hospital	2017
2. "The Evolution of Laparoscopic Surgery", IHI Health Innovation For All, Vancouver, BC	2017
3. "Introduction to Ultrasound Imaging", EECE 544 Medical Imaging, UBC	2016
4. "Introduction to Robotic Surgery", BMEG 500 Orientation to the Clinical Environment, UBC	2016

### TEACHING EXPERIENCE

1. Instructional Skills Workshop – workshop on effective instructional and teaching skills	2016
2. Graduate Teaching Assistant – EECE 542 Computer-integrated Surgery and ELEC 442 Introduction to Robotics	2016
3. Undergraduate Teaching Assistant – CPSC 261 Basics of Computer Systems; CPSC 259 Data Structures and Algorithms for Electrical Engineers; CPSC 260 Data Structures and Algorithms for Computer Engineers	2013 - 2015

## ACADEMIC SERVICE

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|---|------|
| 1. Reviewer. IPCAI 2018 Special Issue: Information Processing for Computer-Assisted Interventions, 9th International Conference | 2017 |
| 2. Reviewer. International Journal for Computer Assisted Radiology and Surgery (IJCARS)   | 2018 |

## VOLUNTEER EXPERIENCE

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|---|---|-----------------------|
| <b>Founder</b>  | <b>UBC AI in Medicine Club</b>            | <b>2019 – Present</b> |
| Created a club focused on improving awareness of and exposure to artificial intelligence (AI) technology within healthcare for medical trainees given the increasing prevalence of AI.                                |   |                       |
| <b>Vice President, Island Medical</b>   | <b>University of British Columbia</b>     | <b>2018 - Present</b> |
| Elected class representative for a cohort of 32 medical students in the Island Medical Program. Introduced Piazza, a modern day online discussion forum, as an educational tool for the MD program.                   |   |                       |
| <b>Student Affairs Representative</b>   | <b>University of British Columbia</b>     | <b>2018 – Present</b> |
| 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.                    |   |                       |
| <b>Junior Section Editor, Reviews</b>   | <b>UBC Medical Journal</b>                | <b>2018 - Present</b> |
| Responsible for facilitating the peer review process of student articles, eliciting faculty member reviews, and providing prompt and succinct revision requests to authors.   |   |                       |
| <b>Co-Director</b>  | <b>Hatching Health</b>                    | <b>2016 - 2017</b>    |
| 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.   |   |                       |
| <b>Founder, Coordinator and Mentor</b>  | <b>UBC Biomedical Eng. Connections</b>    | <b>2016 – 2017</b>    |
| Started a student life initiative connecting undergraduate, new graduates and current graduate students together to promote a sense of community, and support incoming students' queries.                             |   |                       |
| <b>Treasurer, Radio Host, Contributor</b>   | <b>Sharing Science Radio</b>              | <b>2015 – 2017</b>    |
| Organized a bi-weekly science radio show with news and interviews intended for the layperson.   |   |                       |
| <b>Co-Founder and President</b>   | <b>UBC Technology in Medicine Club</b>    | <b>2014 –2015</b>     |
| Led the club in facilitating hands-on workshops and seminars to educate medical and engineering students. Topics included: evolution of surgical technology, medical device collaboration, and e-Health technologies. |   |                       |
| <b>Software Lead</b>  | <b>UBC Orbit</b>                          | <b>2013 - 2014</b>    |
| Worked in a team of 30 to design nano-satellites for a Canada-wide competition.   |   |                       |
| <b>Assistant Coach</b>  | <b>South Delta Varsity Football Club</b>  | <b>2010 –2015</b>     |
| 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.  |   |                       |
| <b>Student Ambassador</b>   | <b>UBC Biomedical Engineering Program</b> | <b>2016 –2017</b>     |
| Engaged prospective UBC students through one-on-one conversations, lab and facility tours, and school fairs.  |   |                       |
| <b>Representative</b>   | <b>University of British Columbia</b>     | <b>2014 –2016</b>     |
| 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.