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ROHIT SINGLA

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EDUCATION

Doctor of Medicine — **University of British Columbia** — **2018 - Present**

M.A.Sc., Biomedical Engineering — **University of British Columbia** — **2015 –2017**

Dissertation: Intra-operative Ultrasound-based Augmented Reality for Laparoscopic Surgical Guidance
Supervisor: Prof. Robert Rohling

B.A.Sc., Computer Engineering — **University of British Columbia** — **2010 –2015**

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

HONORS, AWARDS, AND ACHIEVEMENTS

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

PUBLICATIONS AND PRESENTATIONS

Journal Articles

1. 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.
2. 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.

Conference Presentations

1. 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. [poster]
2. 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. [oral]

3. Schneider C, Singla R, Hetherington J, Forbes C, Tang S, Cho A, Hoyda T, Lan J, Rohling R, Nguan C. Quantitative Measurement of Tacrolimus-induced Tremor in Renal Transplant Recipients: A Feasibility Study. UBC Nephrology Research Day. 2018. [oral]
4. 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. [oral]
5. 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. [oral].
6. 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. [oral]
7. 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. [poster]
8. 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. [poster]
9. 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). 2018. [oral].
10. Singla R, Egcumbe 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. [oral]
11. 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]
12. Edgcumbe P, Singla R, Pratt P, Yang GZ, Nguan C, Rohling. Pico Lantern: A miniature projector for surgical navigation in laparoscopic surgery. Clinician Investigator Trainee Association of Canada. 2015. [oral]

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 Conference, 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

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

PROFESSIONAL EXPERIENCE

Research Engineer **University of British Columbia** **2018**
Developed an iOS app to record and quantify laboring women's shivering, showing positive correlation against clinician assessment (rho=0.47, $p < 0.05$). Released on the app store ("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 applications (3D spine modelling and a simulated operating room) in Unity
Developed and evaluated a needle guide, achieving a 95% success rate and accurate to within 3.6 mm.
Coordinated 12 projects with 3 hospital departments (Urology, Anesthesia, and Maternal/Fetal Medicine)
Led writing of 5 grants, receiving $135K over two years.

Co-Founder **92 Medical** **2017 – 2018**
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.
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 2 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)

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

Undergraduate Research Assistant **University of British Columbia** **2014 – 2015**
Collaborated on using miniaturized projector and ultrasound in conjunction with the da Vinci surgical system to enhance the surgeon's view during minimally invasive surgeries. This was done in 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.

VOLUNTEER EXPERIENCE

Co-Director **Hatching Health** **2016 - 2017**
Led a team of 6 in logistics of a 135-person medtech hackathon, while fundraising $23,000 to run the 3-day event.

Founder, Coordinator and Mentor **UBC Biomedical Eng. Connections** **2016 – 2017**
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.

Treasurer, Radio Host, Contributor. **Sharing Science Radio** **2015 – 2017**
Organized a weekly science radio show. Topics include deep sea exploration, bees, and mental biases

Co-Founder and President **UBC Technology in Medicine Club** **2014 –2015**

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.

Software Lead **UBC Orbit** **2013 - 2014**

Worked in a team of 30 to design nano-satellites for a Canada-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.