

Rohit Singla

EDUCATION

MASc in Biomedical Engineering (University of British Columbia) Sept 2015 - present
Supervision by Prof. Robert Rohling and Prof. Purang Abolmaesumi. Enrolled in Engineers in Scrubs, a clinically oriented medical innovation program. *Research Areas:* ultrasound imaging, surgical robotics, and augmented reality.

BASc in Computer Engineering, Software Option (University of British Columbia) Sept 2010 – May 2015
Graduated with Distinction & Completion of the Co-operative Education program. Ranked top 5 in the Department.

WORK EXPERIENCE

Graduate Research Assistant. (UBC Robotics and Control Lab) Sept 2015 – Present
Thesis: Ultrasound-based Augmented Reality Systems for Guidance in Laparoscopic Partial Nephrectomies.
Developing an augmented reality system to provide intra-operative information in planning and execution of minimally invasive surgeries, leveraging OpenCV, OpenGL C/C++ and ultrasound image processing.
Developing a projector-based augmented reality system for use in intra-operative surgical planning and exploring novel applications in the context of laparoscopic surgeries.
Active collaborations with *Imperial College London* and with *Northern Digital Inc.*

Graduate Teaching Assistant. (Dept. of Electrical and Computer Engineering) Sept 2016 – Dec 2016
Assisted instructors in marking, lecturing, and projects for robotics and advanced computer assisted surgery courses.

Software Development Intern. (Safe Software Inc.) May – Aug 2013, May – August 2015
Designed and implemented C++ modules to extend the functionality of the flagship product called FME.
Implemented a re-design of database formats modules to drastically improve user experience. Formats include PostgreSQL, PostGIS, Amazon Redshift, Oracle, and variants.
Developed front-end and back-end work, complying with a design specification and increased test coverage by 15%.
Engaged product owners and developers; eliciting and iterating on feedback to achieve high stakeholder satisfaction.

Undergraduate Research Assistant. (UBC Robotics and Control Lab) Jan 2014 – May 2015
Research Areas: medical imaging processing, interventional ultrasound, augmented reality, and surgical robotics.
Collaborated on applications of a miniaturized projector and ultrasound to enhance the surgeon's abilities during laparoscopic and robot-assisted laparoscopic surgery. In collaboration with *Imperial College London*.
Worked on a smartphone-based 3D ultrasound guidance system to provide a low-cost solution for needle insertion done by anesthesiologists in the practice of obstetrics.
Worked with several research libraries, such as the Intuitive Surgical Inc. API and Ultrasonix's Ulterius SDK, to support PhD candidates in achieving their research goals.
Researched a variety of computer vision and image processing methods for clinical applications which include stereo correspondence, image de-noising filters, feature detection and tracking.
Recipient of an NSERC Undergraduate Student Research Award.

Undergraduate Teaching Assistant. (UBC Dept. of Computer Science) Sept – Dec 2013, Nov – Dec 2014, Jan – May 2015
Taught and marked approximately 230 engineering students in the fundamentals of data structures, Objected Oriented programming, algorithms, and computer systems in C/C++ through labs and term projects.

PUBLICATIONS

Edgcumbe, P.*, Singla, R.*, Pratt, P., Schneider, C., Nguan, C., & Rohling, R. (2016, August). Augmented Reality Imaging for Robot-Assisted Partial Nephrectomy Surgery. In *International Conference on Medical Imaging and Virtual Reality* (pp. 139-150). Springer International Publishing.

Email: rsingla92@gmail.com

Phone: 1.778.926.9475

TECHNICAL PROJECTS

Portable Video Goggles.

Jan 2016 – Dec 2016

Design and development of portable video goggles for patients to record diagnostically useful nystagmus during spontaneous vertigo attacks. In collaboration with *the Dept. of Otolaryngology at St. Paul's Hospital*.

Artemis – marking surgical flaps using surgical navigation

Sept 2014 – April 2015

Led, designed and developed a prototype tracking with the Kinect v2 to improve patient outcomes in plastic reconstructive surgery and burn treatment. In collaboration with *Noradag Inc.*

Selected as a finalist in the Medical Device Development Centre's Awards for Excellence in Biomedical Engineering Student Design and Innovation.

Basic Microkernel

Sept 2013 – December 2013

Implemented the memory management unit, dispatcher, context switcher, inter-process message passing, signal handling, interrupt descriptor table, keyboard driver, and process scheduling algorithms of a microkernel given the bootstrap code.

COMMUNITY AND VOLUNTEER WORK

Co-Director, Committee Member (Hatching Health)

Feb 2016 – Present

Leading the logistics, planning, and sponsorship requirement of Vancouver's leading inter-disciplinary medical innovation event featuring 100 participants, 35 mentors, a team of 6 organizers and a budget of \$23,000.

Organizer (Biomedical Engineering Student Executive Association)

June 2016 – Present

Created and organizing the association which features student leaders from several of UBC's biomedical student life ventures to coordinate and unify efforts and activities to provide a world-class student community.

Founder, Organizer and Mentor (UBC Biomedical Engineering Connections)

Sept 2016 – Present

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. Organizer until Nov 2016.

Advisor (UBC Biomedical Engineering Student Team)

Aug 2015 – Dec 2016

Advising project teams on a technical and administrative basis, as well as recruiting and interviewing of engineers.

Software Lead. (UBC Orbit)

Jan 2013 – May 2014

Led a team of four software developers in the development of hardware and software components including data collection, error correction, position determination, communications, and system maintenance.

Founder and President. (UBC Technology in Medicine Club)

Aug 2014 – Dec 2015

Led the club in creating hands-on workshops and facilitating seminars lectures to educate medical and engineering students. Topics included: evolution of technology in surgery, medical device collaboration, and e-Health.

Assistant Coach. (South Delta Varsity Football Club)

May 2010 – Aug 2015

Led and taught over 80 teenagers on the techniques and game of American football on a weekly basis, leading to a winning record over five seasons, and over 18 students receiving university scholarships.

SELECTED ACHIEVEMENTS

2017: Faces of Today Award Recipient – outstanding leadership and efforts to innovate and improve the community

2017: Graduate Student Initiative Award -

2016: Winner of the Rick Hansen Access Innovation Challenge (Rick Hansen Foundation).

2015: Engineers in Scrubs Research Fellowship.

2015: NSERC Alexander Graham Bell Canada Graduate Scholarship – Master's level.

2015: Margaret E. Barr Bigelow Memorial Scholarship – merit-based academic award.

2011 – 2015: Dean's Honour List – sessional averages of 86.3%, 89.9%, 89.2%, and 91.8%.

2014: Trek Excellence Scholarship for Continuing Students – top 5% of students for the year.

2014: NSERC Undergraduate Student Research Award.