Email: rsingla92@gmail.com **Phone**: 778-926-9475

Rohit Singla

SKILLS AND EXPERTISE

Languages	Technical Areas	Development Tools	Non-Technical
C/C++ & Java	Augmented reality & computer vision	OpenCV & OpenGL	Hard working and collaborative learner
Python & MATLAB	Medical image processing	Git & Subversion	Strong and adaptive problem-solver
MySQL, PostgreSQL, & PostGIS	Surgical navigation & robotics	Windows, Linux, Android, iOS	Excellent analytical & leadership skills

WORK EXPERIENCE

Research Engineer. (UBC Robotics and Control Lab, VGH STELLAR Lab) Jan 2018 – Present

Managing multiple urology projects with clinical collaborators, including intelligent system for surgical tool counting, semantic segmentation of surgeries, kidney stone tracking, and virtual reality hospital tours.
Developing a virtual operating room environment for the Microsoft HoloLens in Unity and C#
Developing an object detection algorithm for the localization of kidney stones in fluoroscopic images in MATLAB
Leading the development of a novel needle guide for 2D ultrasound that is accurate to within 3.5mm (includes pre-clinical and clinical study design and execution, and project management of a team of 3)

Graduate Research Assistant. (UBC Robotics and Control Lab) Sep 2015 – Dec 2017

Lead developer on 2 augmented reality systems for kidney cancer surgery, achieving a ~50% improvement of clinical measures in mock surgeries and receiving 2 best paper awards.
Developed and designed software modules for a Windows desktop app in C++ using OpenGL and OpenCV.
Implemented and executed calibration, feasibility, verification, and validation strategies for quality assurance.
Collaborated with industry (Northern Digital Inc.) and international academic groups (Imperial College London).

Graduate Teaching Assistant. (Dept. of Electrical and Computer Engineering) Sep 2016 – Dec 2016

Courses included: EECE 542 Computer-integrated Surgery, and ELEC 442 Introduction to Robotics
Mentored students in several technical topics including: medical imaging, image registration, & surgical robotics.

Software Development Intern. (Safe Software Inc.) May – Aug 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.
Created system-level tests to verify adherence to a design specification, increasing test coverage by 15%.

Undergraduate Research Assistant. (UBC Robotics and Control Lab) Jan 2014 – May 2015

Worked on Android-based 3D ultrasound needle guidance using accelerometer and gyroscope for tracking.
Implemented several MATLAB scripts and C++ programs to perform computer visions tasks including stereo correspondence, image noise filtering, feature detection and tracking and camera calibration.

EDUCATION

MASc in Biomedical Engineering. (University of British Columbia) Sep 2015 – Jul 2017

Thesis: Intra-operative Ultrasound-based Augmented Reality for Laparoscopic Surgical Guidance
Supervision by Prof. Robert Rohling. Enrolled in Engineers in Scrubs, a medical innovation program.

BASc in Computer Engineering, Software Option. (University of British Columbia) Sep 2010 – May 2015

Graduated with Distinction & completion of the Co-operative Education program. Ranked top 5 in the Dept.

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TECHNICAL PROJECTS

Patient Shivering Analysis iOS App. (Dept. of Anesthesia, BC Women's Hospital) Sept 2017 – Jan 2018
Created an iOS app to record accelerometer data, display the acceleration trace, and export data via email
Created MATLAB scripts to perform statistical analysis on collected data to assess inter-patient variability and correlation with patient and physician measures on shivering severity.

Portable Video Goggles. (Dept. of Otolaryngology, St. Paul's Hospital) Jan 2016 – Dec 2016
Designed and developed a video device using the Raspberry Pi and Python for patients to remotely record diagnostic information during vertigo attacks.
Implemented a single-button state machine to initiate, record, save, and shutdown for operational ease.

Artemis – marking surgical flaps using surgical navigation Sep 2014 – Apr 2015
Team lead and developer on a prototype tracking system with the Kinect v2 using C/C++ and Microsoft WPF to track a surgical marker in 3D space. Senior course project with Novadaq Inc.

SELECTED ACHIEVEMENTS

2017: Best Paper Award (11th Annual Augmented Environments for Computer Assisted Interventions)
2017: Best Paper Award (11th Annual Lorne D. Sullivan UBC Urology Research Day)
2017: Rising Star Award (UBC Faculty of Applied Science)
2017: Faces of Today Award Recipient (UBC) – outstanding leadership and efforts to improve the community
2016: Winner of the Rick Hansen Access Innovation Challenge.
2015: Finalist in Medical Device Development Centre's Awards for Excellence in BME Design and Innovation
2015: Engineers in Scrubs Research Fellowship.
2015: Alexander Graham Bell Canada Graduate Scholarship (NSERC) – Master's level.
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 (UBC) – top 5% of students for the year.
2014: Undergraduate Student Research Award (NSERC).

COMMUNITY AND VOLUNTEER WORK

Co-Director, Committee Member (Hatching Health) Feb 2016 – May 2017
Led 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.

Founder, Coordinator and Mentor (UBC Biomedical Engineering Connections) Sep 2016 – May 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. (UBC Sharing Science Radio) Feb 2015 – Jan 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) Aug 2014 – Dec 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.

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 over 18 students receiving university scholarships.