**Email**: rsingla92@gmail.com **Phone**: 1-778-926-9475

Website: ca.linkedin.com/in/rsingla92

# **Rohit Singla**

## **TECHNICAL SKILLS**

| Languages          | Development Tools         | Other Technical       | Non-Technical            |
|--------------------|---------------------------|-----------------------|--------------------------|
| C/C++              | OpenCV & OpenGL           | Augmented reality &   | Hard working and quick   |
|                    |                           | computer vision       | learner                  |
| MATLAB & Python    | Git & Subversion          | Surgical navigation & | Strong and adaptive      |
|                    |                           | robotics              | problem-solving skills   |
| Java               | Windows, Linux, Android   | Camera/projector      | Excellent organizational |
|                    |                           | calibration           | & analytical skills      |
| PostgreSQL/PostGIS | Visual Studio 2008 – 2015 | Medical image         | Market analysis &        |
|                    |                           | processing            | business development     |

### **WORK EXPERIENCE**

## **Graduate Research Assistant. (UBC Robotics and Control Lab)**

Sep 2015 – Present

Project lead on an augmented reality system for kidney cancer surgery, achieving a ~50% improvement of clinical measures in mock surgeries and receiving 2 best paper awards

Developed software modules for a Windows desktop application in C++ using OpenGL and OpenCV.

## **Graduate Teaching Assistant. (Dept. of Electrical and Computer Engineering)**

Sep 2016 – Dec 2016

Mentored students in several technical topics including: medical imaging, point-based and intensity-based registration, error estimation, surgical robotics, and forward/inverse kinematics.

#### Software Development Intern. (Safe Software Inc.)

May – Aug 2013, May – Aug 2015

Implemented a re-design of C++ modules interfacing with databases to drastically improve user experience. Formats include PostgreSQL, PostGIS, Amazon Redshift, Oracle Object-Relational, and Oracle Spatial. Developed front-end and back-end work according to a design specification and increased 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 de-noising filters, 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.

#### **TECHNICAL PROJECTS**

## **Patient Shivering Analysis.**

Sent 2017

Created MATLAB scripts to process, sanitize and analyze iPhone accelerometer data from shivering patients. Performed statistical analysis on collected data to assess inter-patient variability and correlation with patient and physician measures on shivering severity.

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## Portable Video Goggles.

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. Performed problem identification and requirements elicitation with clinicians from St. Paul's Hospital.

### 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

### **Advisor (UBC Biomedical Engineering Student Team)**

Aug 2015 – Aug 2017

Advising project teams on a technical and administrative basis; and recruiting of engineering students.

#### 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, Organizer 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.

# 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.