

## **ARUSHRI SWARUP**

58 Northforest Trail, Kitchener, Ontario, N2N 2Z1

519-575-5468 | arushri.swarup@mail.utoronto.ca

**PERSONAL STATEMENT:** A driven, hard-working and optimistic MASc. candidate, developing new instruments to facilitate endoscopic ear surgery, through IBBME and the Hospital for Sick Children. Through the undergraduate program of Engineering Science, Biomedical Systems Option at U of T as well as through internships, she developed engineering design, teamwork and project management skills.

## **WORK EXPERIENCE**

**Masters of Applied Science Candidate – IBBME and the Hospital for Sick Children** Sept, 2016 - Present

- Collaborating with a pediatric ear surgeon to develop and test surgical instruments
- Fabricated a prototype instrument using a micro-mill machine and assembly of components and presented it at the 2<sup>nd</sup> World Congress for Endoscopic Ear Surgery in Bologna, Italy in April, 2017
- Conducting a needs analysis survey for international endoscopic ear surgeons to inform the design of instruments, with SickKids Research Ethics Board approval; a clinical peer-reviewed paper will be submitted in September, 2017

**Capstone Engineering Design Teaching Assistant – IBBME** Sept, 2016 - Present

- Provides thorough feedback to engineering teams on how to design prototypes, manage the project, communicate with clients & supervisors and deliver final presentations
- Connected teams with resources and advisors around University of Toronto and SickKids Hospital
- Presented a poster at the CEEA conference in June, 2017: "Using a Multidisciplinary Team-Based Challenge to Promote Brainstorming and Prototyping of Medical Devices"

**Research Student – Centre for Image Guided Innovation and Therapeutic Intervention (CIGITI) at The Hospital for Sick Children** May – August, 2016

- Co-author for an American Society of Mechanical Engineers (ASME) design innovation paper submitted May, 2017 outlining the mechanical design and test results of a compliant joint
- Used Solidworks, 3D printing and CNC Mill Machining to fabricate specimens, characterized force vs. deformation using a force sensor and Arduino apparatus, and analyzed results with Matlab
- Mentored summer students to design and fabricate prototypes

**Engineering Associate – Baylis Medical Company** May, 2014 – August, 2015

- Performed and documented device verification and validation testing as per ISO standards
- Prototyped and tested medical device production tools while incorporating feedback from senior engineers and device production operators

## **EDUCATION**

University of Toronto September, 2011 – April, 2016

- **Bachelor of Applied Science and Engineering, Biomedical Systems Option, Graduated with Honours, 3<sup>rd</sup> and 4<sup>th</sup> year GPA: 3.7**

## **ENGINEERING PROJECTS**

**Design of an Endoscopic Neurosurgical Bipolar Robotic Tool** January – June, 2017

- Collaboratively designed, fabricated and tested a bipolar robotic tool with a team at the CIGITI lab
- Used CAD, micro-milling machine and soldering techniques to fabricate and assemble the tool
- Produced two videos outlining the design which included testing the tool operated by a surgical robot

- The tool was demonstrated at a presentation at the Hamlyn Robotics Competition hosted by Imperial College London in June, 2017

#### **Design and Fabrication of an Endoscopic Ear Surgery Tool**

September – December, 2015

- Collaboratively designed a modified surgical tool for Endoscopic Ear Surgery with four team members and an ear surgeon at SickKids Hospital
- Used Solidworks, 3D printing and Mill machining to design a functional prototype and tested inside a 3D printed ear canal model and a cadaver ear canal

#### **Undergraduate Thesis: Computer Simulation of Nerve Stimulation**

September, 2015 – April, 2016

- Developed a model of electrical nerve stimulation on a simplified human leg using COMSOL Multiphysics physical modeling software
- Analyzed nerve excitability using Matlab and optimized model parameters
- Delivered thesis presentation to peers and supervisor; submitted Thesis report

#### **Fabrication of Pneumatic Engine - Basic Machining Course at George Brown College**

February, 2015

- Learned to use a lathe, mill machine and drill press to machine a pneumatic engine

#### **Aeroponic Garden Project**

May 2012 – November, 2014

- Collaboratively built an Aeroponic Garden System consisting of individual garden units with a central nutrient-spraying and drainage system, with a team and U of T professor
- Implemented the project in an elementary school classroom in Toronto

#### **SKILLS**

- Matlab, Solidworks, SolidCAM, Microsoft Office, COMSOL Multiphysics, ImageJ
- CNC Mill Machining, Laser Welder, Force Gauge, Pull Test Stand, 3D Printing
- Certified in Laser Safety Training by U of T, May, 2013

#### **AWARDS**

- Harry Barberian Scholarship Award, Otolaryngology – Head&Neck Surgery, U of T, 2017
- POS Innovation Grant, SickKids, 2017
- Director's Innovation Award, August, IBBME, 2016
- Dean's List University of Toronto, 2015-2016
- NSERC IUSRA Award May-August, 2014 and 2015 during PEY at Baylis Medical

#### **CLINICAL AND VOLUNTEER EXPERIENCE**

Grand River Hospital/Regional Cancer Centre Volunteer: Summer Student Program

July – August, 2011

- Converses with patients undergoing chemotherapy

Volunteer at Baylis Medical Company Christmas Party

December, 2014

Engineering Science Ambassador

September – December, 2013

- Converses with prospective Engineering Science students at University Fairs

#### **HOBBIES**

Bollywood Dance Instructor at Hart House, U of T

February – July, 2016

**REFERENCES** – supplied upon request