**ARUSHRI SWARUP**

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**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. Has developed prototyping, engineering design, teamwork and project management skills through her undergraduate degree of Engineering Science, Biomedical Systems Option at U of T and her internships.

**WORK EXPERIENCE**

**Masters of Applied Science Candidate – Institute for Biomaterials and Biomedical Engineering and the Hospital for Sick Children** Sept, 2016 - Present

* Working with a pediatric ear surgeon to develop and test surgical instruments to facilitate endoscopic ear surgery (EES)
* Presented a prototype tool at the 2nd World Congress for Endoscopic Ear Surgery in Bologna, Italy, April, 2017
* Conducting a needs analysis survey for international endoscopic ear surgeons to inform the design of new tools to address surgeon’s needs, with SickKids Research Ethics Board approval
* Conducting a time flow study to analyze the inefficiencies of surgical steps to determine new tool functionalities that would facilitate EES

**Capstone Engineering Design Teaching Assistant – IBBME** Sept, 2016 – Apr, 2017

* Provide technical and project management support for student teams on how to translate their client’s needs to an engineering problem; marked reports and presentations
* Presented a poster at the CEEA conference in June, 2017 titled: “Using a Multidisciplinary Team-Based Challenge to Promote Brainstorming and Prototyping of Medical Devices”
* Facilitated prototyping exercise lab sessions, lecture about how to succeed in class

**Research Student – Centre for Image Guided Innovation and Therapeutic Intervention at the Hospital for Sick Children** May – Aug, 2016

* Co-author for ASME research paper submitted May, 2017
* Used Solidworks, 3D printing and CNC Mill Machining to fabricate components for experiments and analyzed data using Matlab
* Conducted experiments to characterize force vs. deformation trends nitinol tubes using a motor, force sensor, Arduino board and laser apparatus
* Mentored summer students to design and fabricate prototypes

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

* Designed, tested, documented and implemented device verification and validation testing
* Managed projects involving communication with company departments and suppliers
* Prototyped and tested production tools, using Solidworks and 3D printing, while incorporating feedback from senior engineers and production operators
* Developed a Laser Welding Training Document and Manufacturing Protocols

**EDUCATION**

University of Toronto  September, 2011 – April, 2016

* **Bachelor of Applied Science and Engineering, Biomedical Systems Option, Graduated with Honours, 3rd and 4th year GPA: 3.7**
* Relevant Courses: Biomedical Engineering Design, Undergraduate Thesis, Biomaterial and Medical Device Development, Human Physiology, Cells and Tissue Engineering

**ENGINEERING PROJECTS**

**Design of a Neuroendoscopic Bipolar Robotic Tool** January – June, 2017

* Collaboratively designed a bipolar tool with a team at the CIGITI lab
* Used CAD, micro-milling machine and soldering technqiues to fabricate and assembly a micro-tool
* Delivered two videos outlining the design which included testing the tool on the DVRK
* Tool was demonstrated at a presentation at the Hamlyn Competition hosted by Imperial College London

**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 ENT 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
* Analyzed nerve excitability using Matlab and optimized model parameters
* Delivered thesis presentation to peers and supervisor and submitted Thesis report

**Fabrication of Pneumatic Engine -** Basic Machining Course at George Brown College February, 2015

* Used Lathe, Mill machine and Drill press to machine a pneumatic engine

**Development of an Antimicrobial Resistant Microorganism Monitoring System**  May – August, 2013

* Conducted diffraction-based immunoassays and tested them on a system of optical instruments along with a fellow student and analyzed data using Matlab

**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

**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

* Interacted with patients undergoing chemotherapy

**LEADERSHIP/VOLUNTEER EXPERIENCE**

Engineering Science Ambassador  September – December, 2013

* Conversed with prospective Engineering Science students at University Fairs

**HOBBIES**

Bollywood Dance Instructor at Hart House, U of T February – July, 2016

REFERENCES: Available on Request