

# Natalie Smith | Biomedical Engineer

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## Education

**University of Victoria**  
*B.Eng, Biomedical Engineering*  
Specialization in Mechatronics

**Victoria BC**  
2011–2016

## Key Competencies

- Hands on experience with leading edge software and firmware technologies including C/C++, MySQL, MatLab, LabView, and microcontrollers
- Experience working with medical devices in clinical settings
- Experience with the project development life cycle and navigating through various stages of development in a team setting
- Self-starting, independent worker with the willingness and work ethic to learn new technologies and skills
- Extensive experience with customer service and practical problem-solving as well as exceptional written and verbal communication skills

## Experience

**University of Victoria**  
*Undergraduate Researcher*

**Victoria BC**  
May–Aug 2015

Worked in the Crystal Growth Laboratory designing a new control system for a 30 zone crystal growth furnace.

- Ran experiments on the crystal growth furnace including material preparation, furnace loading, and sample testing using a Scanning Electron Microscope
- Designed and implemented a fuzzy PID control system in LabView with adaptive control for the crystal growth furnace

**University of Victoria**  
*Undergraduate Researcher*

**Victoria BC**  
Sept–Dec 2013

Worked in the Biomedical Design and Systems Laboratory developing a medical phantom for use in testing and calibrating an ultrasound-controlled hand prosthesis.

- Designed and developed a medical phantom representing the ultrasonic properties of the tendon-hand system
- Tested prototypes and determined ultrasonic properties of materials
- Used an Ultrasonix ultrasound machine and MatLab to capture video and images of phantom prototypes

**Island Health**  
*Clinical Engineering Co-op*

**Victoria BC**  
Jan–Apr 2013

Worked in the Biomedical Engineering department of Island Health to assist in tasks such as device procurement and installation, cost analysis, preventative maintenance, and consulting with medical professionals.

- Assisted in medical device procurement and installation in hospital settings
- Performed cost analysis for major contract renewals
- Performed preventative maintenance on medical devices such as infusion pumps, defibrillators, and AEDs
- Consulted with medical professionals within multiple health networks across Canada in preparation for a networked fetal monitoring system

### **Saanich Commonwealth Place**

*Team Leader, Facility Attendant*

**Victoria BC**

*2011–Present*

Work in supervisory roles as a Team Leader and Facility Attendant to oversee multiple staff and ensure that programs are running safely and effectively.

- Team Leader: Directly supervise a team of lifeguards to ensure safe pool coverage, oversee first aid situations, mediate public relations situations and provide excellent internal and external customer service
- Facility Attendant: Responsible for overseeing all facility programs, coordinating and providing back-up for all staff and conducting emergency procedures in case of emergencies

## **Technical Projects**

**Biomedical Design Project:** Worked with BOMImed to develop a breathing simulator according to their specific needs

- Designed and built a breathing simulator to mimic breathing action of human lungs
- Integrated sensors and mechanisms including a linear actuator to produce, regulate and monitor the output of the simulator to have the desired temperature, humidification, and CO<sub>2</sub> content of expelled breath

**Mechatronics:** Designed the firmware to accomplish a conveyor belt sorting task

- Integrated multiple sensors, actuators and motors with a microcontroller
- Programmed microcontroller in C to accomplish desired tasks

**Microfluidic Chip:** Worked in a team of students to complete all stages of development for a microfluidic chip including problem definition, concept generation, project planning, modeling, decision making, design synthesis, prototyping, and testing

- Generated prototypes and completed Solidworks models for parts fabrication
- Created final design by pouring and setting PDMS into custom machined Delrin moulds

**Neural Networks:** Designed a neural network to classify data instances in an online breast cancer database as malignant or benign

- Used MatLab to implement a three-layer feedforward neural network
- Put neural network through training, validation, and test stages to automatically classify instances of breast cancer malignancy

**Biomedical Image Processing:** Solved task of retinal vessel segmentation in retinal images by using MatLab to implement adaptive local thresholding by multithreshold probing

## **References**

<b>Dr. Nikolai Dechev</b>	<b>Dr. Kelly Stegman-Brooks</b>	<b>Michael Sheehan</b>
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**BSI America**  
Los Angeles, CA

April 9, 2017

Dear Sir or Madam,

I am writing to apply for the position of Medical Device Technical Specialist at BSI America. I graduated with a Bachelor's degree in Biomedical Engineering with a specialization in mechatronics and I believe my academic and professional background make me an ideal candidate for this position.

I have experience with medical devices in a clinical setting while working with Island Health in Victoria, BC. Here I was involved in medical device contract renewals, medical device preventative maintenance, and device procurement and installation in hospital settings. In addition to my clinical experience, I have research experience at UVic's Biomedical Design and Systems Laboratory designing, prototyping, and testing a medical ultrasound phantom to mimic the ultrasonic properties of the hand and wrist. My academic career has also given me extensive technical experience through a wide variety of project work. I have worked in teams to develop biomedical devices such as microfluidic chips and human lung simulators. Through these projects I was exposed to Solidworks design, machining, and key aspects of the product development lifecycle. Additionally, project work with biomedical image processing, mechatronics, and neural networks have given me extensive experience in MatLab, C, sensor integration, and with microcontrollers.

My wide-ranging work and academic experiences have given me the ability to work effectively within a team setting while also being a motivated, proactive and self-starting independent worker. I value clear written and verbal communication to ensure projects are completed efficiently. I also have excellent problem-solving skills which allow me to deal with the unknown and unexpected. I am extremely resourceful with the willingness and work ethic to learn new technologies and skills in the ever-changing field of Biomedical Engineering.

I believe that my experience, drive and passion for learning and hard work would make me an excellent addition to your team as a Medical Device Technical Specialist. I look forward to following up to this application.

Sincerely,

**Natalie Smith**

*Attached: Resume*