Natalie Smith | Biomedical Engineer

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Education

University of Victoria **Victoria BC**
B.Eng, Biomedical Engineering *2011–2016*
Specialization in Mechatronics

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 **Victoria BC**
Undergraduate Researcher *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 an implemented a fuzzy PID control system in LabView with adaptive control for the crystal growth furnace

University of Victoria **Victoria BC**
Undergraduate Researcher *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 **Victoria BC**
Clinical Engineering Co-op *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 **Victoria BC**

Team Leader, Facility Attendant *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 CO2 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

Dr. Nikolai Dechev	Dr. Kelly Stegman-Brooks	Michael Sheehan
Associate Professor	University of Victoria	Program Technician
University of Victoria	Biomedical Design and Systems Laboratory	Saanich Commonwealth Place
Biomedical Design and Systems Laboratory	kstegman@uvic.ca	250-475-7607
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