ANDREW SHIN

in Andrew Shin ⬡ Projects 🌐 Website ✉ a9shin@uwaterloo.ca

EDUCATION

University of Waterloo - Biomedical Engineering
Candidate for Bachelor of Applied Science
- Biology/Chemistry, Data Structures/Algorithms (C#/C++), Dynamics, Digital Circuits, Signals, Prototyping/Design, Systems Modelling, Tactile Sensors

SKILLS

- **Biomedical** : Microfludics, Fluid Dynamics, Myoelectric, Immunoassay Development, LNP formualtion
- **Mechanical**: SolidWorks, AutoCAD, Rapid Prototyping, Circuitry, Soldering, CFD, PLM, CAD Drawings

EXPERIENCE

Instrumentation Engineer
Cytiva - Precision NanoSystems Inc.   *Sep 2023 - Dec 2023*
- Resolved product incident reports in **sustaining engineering** by managing **Product Life Cycle**, investigating product failures, and improving SOPs, manufacturing work instructions
- Designed, documented and built **test jigs**, with loadcell, picoscope and custom syringe fixture, for **V&V tests** to assess stick-slip behaviour of syringes
- Supported manufacturing transfer of the external pipeline for the 'GMP System' instrument by creating **GD&T** standard **P&ID** manufacturing-drawings
- Managed **Multi-level BOM** of Tubing for 'GMP System' throughout manfacturing transfer and explored each materials compatibility with gamma testing for **RoHS/REACH** Compliance

R&D Microfludics Engineer
Vital Biosciences   *Jan 2023 - Apr 2023*
- Conducted **immunoassay** experiments on consumable **microfluidic** disc devices, optimizing analysis of blood by changing spin, input reagent volumes and channel / chamber design.
- Designed microfluidic channel and chambers using **AutoCAD layers** by changing volume and shape of chambers to manipulate centrifugal pressure driven fluid-flow, to be milled or **injection molded**
- Integrated **iterative V&V testing** to investigate contamination and sedimentation failures in on-disc assays through image/video analysis and measuring final level of assay complexes

PROJECTS

- **Prosthetic Hand Device**
  - Prototyped a medium fidelity **EMG** based **prosthetic**-hand device with 3D printed fingers, gears, circuit/battery housing and arm socket
  - Optimized Amps and Rectifier and Bandpass Filter to produce desired gain, isolate signals in 90-200 Hz range, and increase resolution of EMG signal   Tested electrical properties of circuit using multimeter and oscillospe to evalute performance based of theoretical circuit analysis techniques

- **EMG Fabric R&D Hardware - UW Biomechatronics**
  - Developing a wearable and reusable, fabric-based snap-on **EMG sensors** to be used in prosthetics for amputee users
  - Modelled **exoskeleton** of hand and housing for MyoWare to ESP32 and a snap-on **electrodes** using SolidWorks to store circuit components of prosthetic
  - Programmed **Python** script to process EMG data collected from MyoWare sensor using an **Arduino** to categorize and recognize various hand movements

- **Object Detection - Hand Signals**
  - Developed a program to recognize and translate various hand signals into English in real-time
  - Used **Python**, **OpenCV** and **LabelImg** to collect images and classify data to be used to train model
  - Trained **Tensorflow** object detection model using images and display bounding box