2020-21
UBC Bionics

Hiring Package

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About UBC Bionics

Amidst the increasing demand for bionic devices, a similarly growing public interest in bionic technology, and UBC's strategic positioning in the field, our design team, UBC Bionics strives to foster excellence in this particular study. Our ultimate goal is to create solutions that can replace human physiology, either by prosthesis or implants. UBC Bionics's current project is to design and build a smart bionic hand that can be used by individuals who have suffered an amputation or congenital birth defects.

Pillars of UBC Bionics

*"We're entering a **bionic era** where we're beginning to see technology that's sophisticated enough to emulate key physiological functions."*
-Hugh Herr

Community

UBC Bionics is a place where students can directly give back to the community of Canada by providing low-cost bionics while furthering their own education and advocacy.

Education

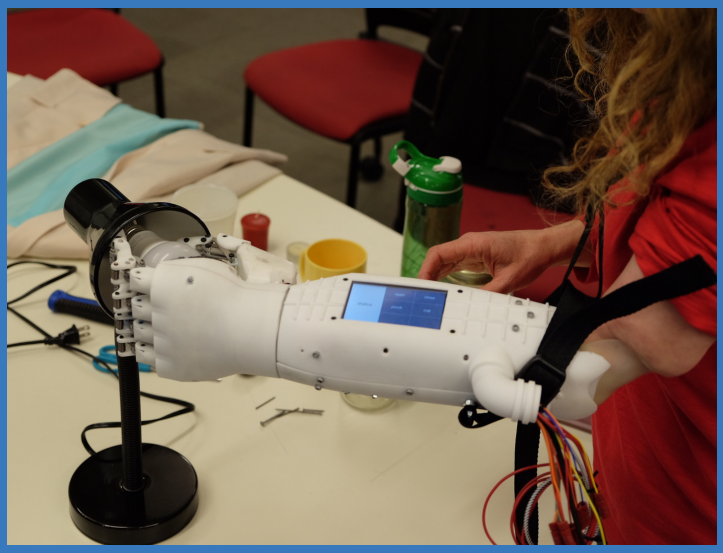
UBC Bionics endeavors to develop and enrich the future STEM leaders of our generation and beyond, equipping students with the know-how and hands-on technical experience.

Innovation

UBC Bionics aims to provide students with the platform to transform their ideas into reality, innovating new devices and exploring the frontiers of bionics.

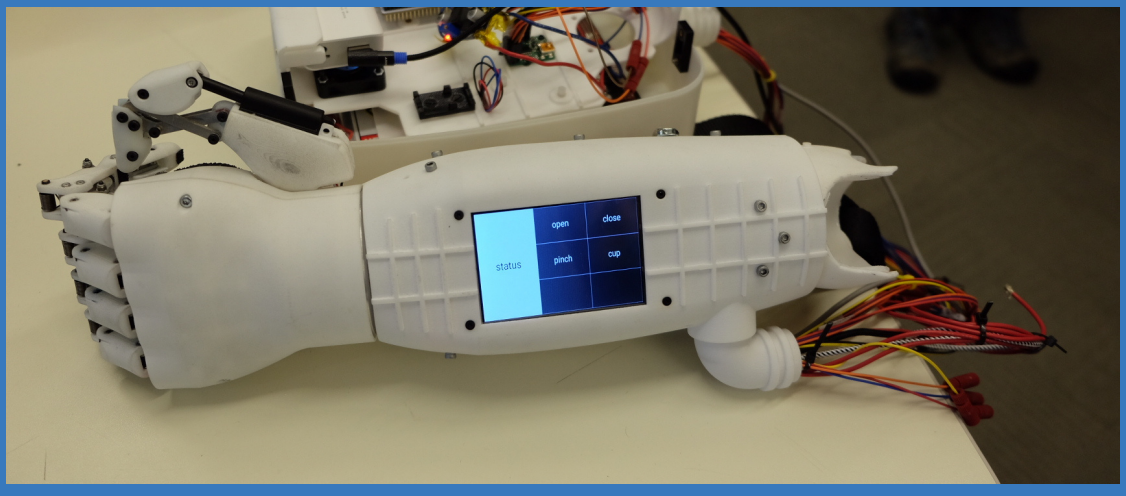
Our Pilot Project: GRASP

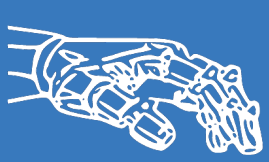
UBC Bionics's pilot project aimed to develop a low-cost, reliable, and smart bionic hand. The desired abilities of the hand include:



- object recognition
- various grip positions
- integration with machine learning
- incorporation of an anthropometrically-centered design
- a basis in sonomyography and myoelectricity

Our current device features many different functionalities, including a phone software interface, an intuitive anthropomorphic design, and various grip positions.



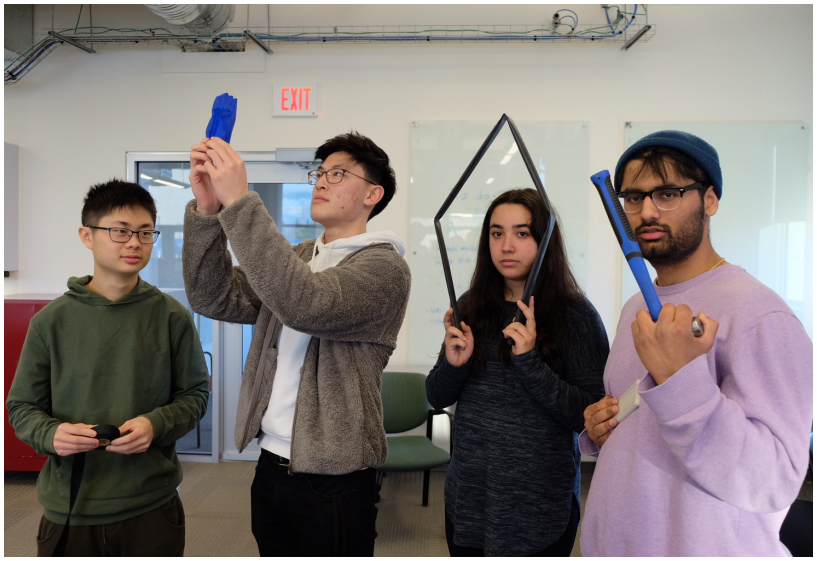


Cybathlon 2021

Last year, UBC Bionics was excited to announce its acceptance to the CYBATHLON 2020 main event on May 2-3 in ETH Zurich, Switzerland. This event happens once every 4 years and is the pinnacle of bionics competitions, with industry-leading companies and research labs such as Ottobock and Touch Bionics participating. Unfortunately, UBC Bionics was unable to attend or make online accommodations for the competition due to COVID-19. Nonetheless, we have taken this time to improve upon our design and functionality with the hopes of attending a CYBATHLON Series competition in 2021. Once again we plan on participating in an arm-related race using our current project, GRASP.

For more information about CYBATHLON and the competitions and showcases they hold please refer to CYBATHLON's website linked below:
https://cybathlon.ethz.ch/en

Our Team



Sub-team Descriptions and Duties

Mechanical

- Designs structure of bionic arm, models devices on CAD software
- Research and develop mechanical designs via engineering design process, prototyping, and SolidWorks

Electrical

- Develops EMG acquisition and battery management systems and integrates sensors, motors, and actuators via our PCB
- create PCBs using Altium
- Use electrical equipment like Oscilliscope for testing

Software

Embedded

- Works on low-level control of the hardware and taking in sensor data
- Detail the most optimal design, programming, and actuation methods to follow
- Uses Rust to program

Analytics

- Uses data science and machine learning to improve the usability of the hand
- Uses Python to program and does data analysis on sensor information like EMG, FSR, etc.

Administration

- Recruitment
- Organizing meetings and taking minutes
- Maintaining budget and accounting
- Planning team-bonding events
- Social media presence and website development

Message from the Team Captains

"UBC Bionics, since its inception, has been dedicated to advancing student knowledge on the manmade replacement for human physiology. As we begin our fourth year, we are amazed at how far this team has come and incredibly excited for the future. Bionics is such a fascinating field, and we believe this team has the ability to advance it even further. We hope you'll join us in helping us get there!"

Faheem Saeed
Founder and Co-Captain

Braeden Jury
Co-Captain

Contact Information

We would love for you to help us in reaching our goals as a team and furthering our capabilities as innovators. If you are interested, please contact us at the following addresses:

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