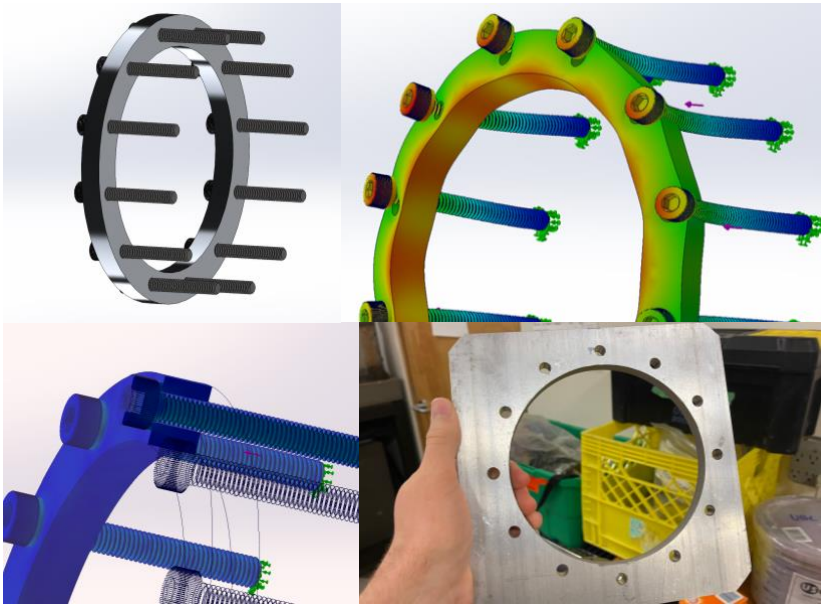
Relevant Projects

Outlined below are several projects I have been a part of, ranging from high school projects to technical assignments on the UBC Rocket, and UBC Concrete Toboggan design teams.



UBC Rocket Washer Design

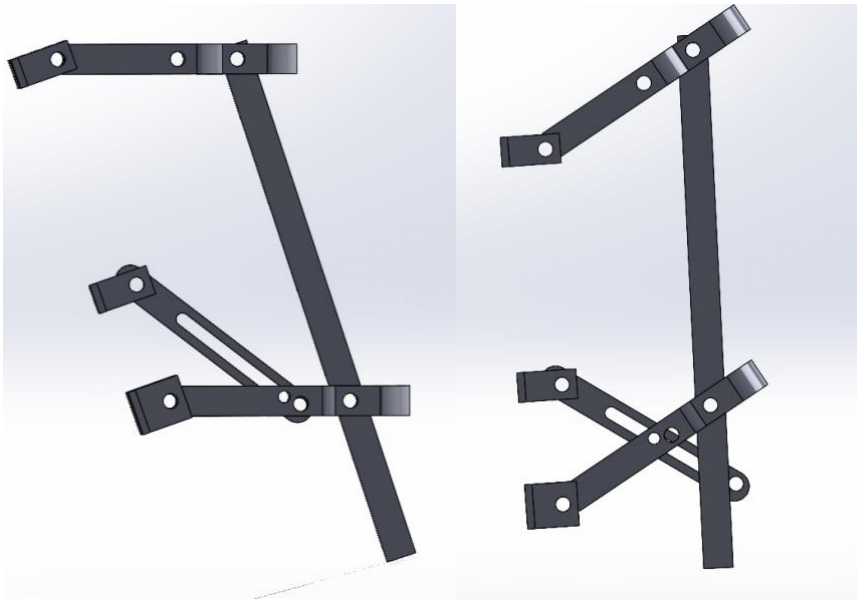
During a hot fire of the UFE 1 liquid rocket engine. The test stand experiences a RUD (rapid unscheduled disassembly).

As part of UBC Rocket's liquid propulsion sub-team, I was tasked with designing a new mount, machined to higher precision for mounting the rocket engine during the next hot fire. To accomplish this, I designed the part in SolidWorks, ran multiple FEA tests on the component and finally I was taught how to manufacture the part using the UBC PHAS waterjet.

UBC Concrete Toboggan Brake Design

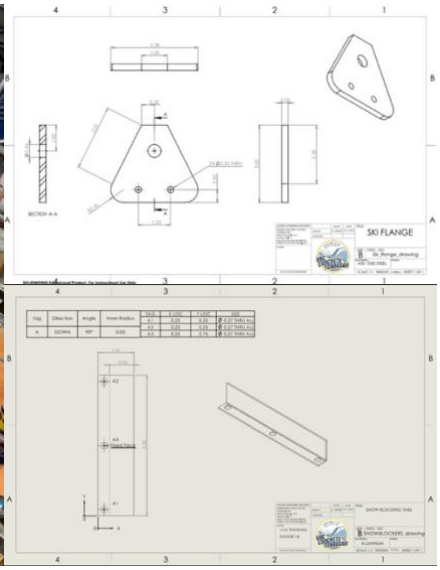
At the 2024 concrete toboggan competition UBC placed last, in large part due to an overweight braking system that used a large metal plate to brake.

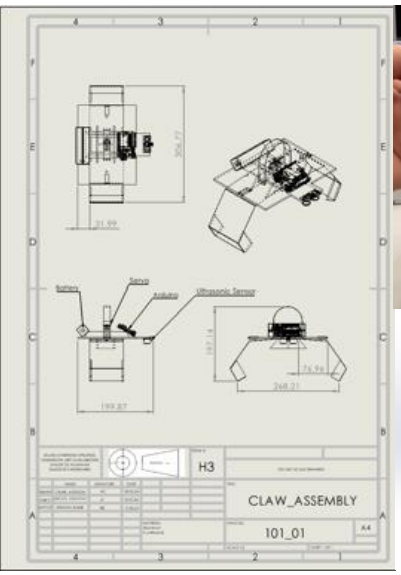
As part of the braking sub-team, I imagined a new braking system that dropped the toboggan onto the snow to brake. This will save a substantial amount of weight and increase our braking force. On the right are CAD models I constructed in SolidWorks for the 2025 braking system.

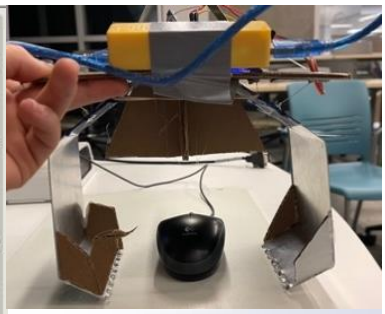


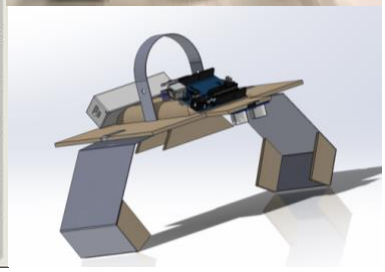
UBC Concrete Toboggan Part Drawings

As part of the UBC concrete toboggan braking sub-team, I was tasked with creating SolidWorks drawings for manufacturing the various braking components. In doing this I learned various techniques for creating simple, easy to understand engineering drawings.









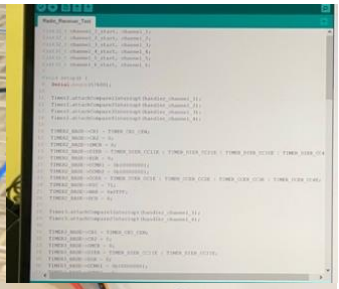
Claw Project CAD Design

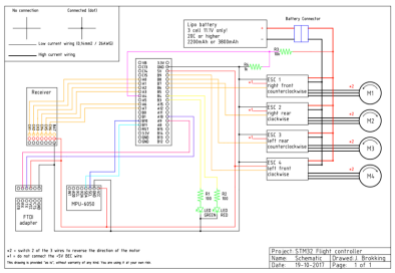
In my APSC 101 course, one of the projects was designing and building a claw to retrieve objects. For this project I helped design, program, and manufacture the claw. I was also responsible for modelling the claw in CAD and creating various engineering drawings in Solidworks.

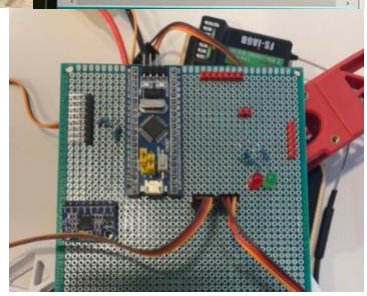
Keychain CAD Design

For my APSC 100 course I designed a keychain from scratch, this involved learning various Solidworks functions and tools. The keychain was then 3d printed and now resides on my backpack.

Gr12 Capstone Project







For my 12th grade capstone project, I decided to build a drone from scratch.

For this project I learned how to use the STM32 microcontroller with various other components (MPU6050, radio receiver, speed controllers). I also learned how to solder, going from complete beginner to soldering the header pins onto all the components. I also soldered the entire circuit shown on the bottom left onto a prototype board shown on the bottom right. Finally, I used the Arduino to program the STM32 to act as a flight controller for the drone. In the end I was able to construct a fully functional drone from scratch. More information can be found on my blog: https://addisoncraik.com/blog/