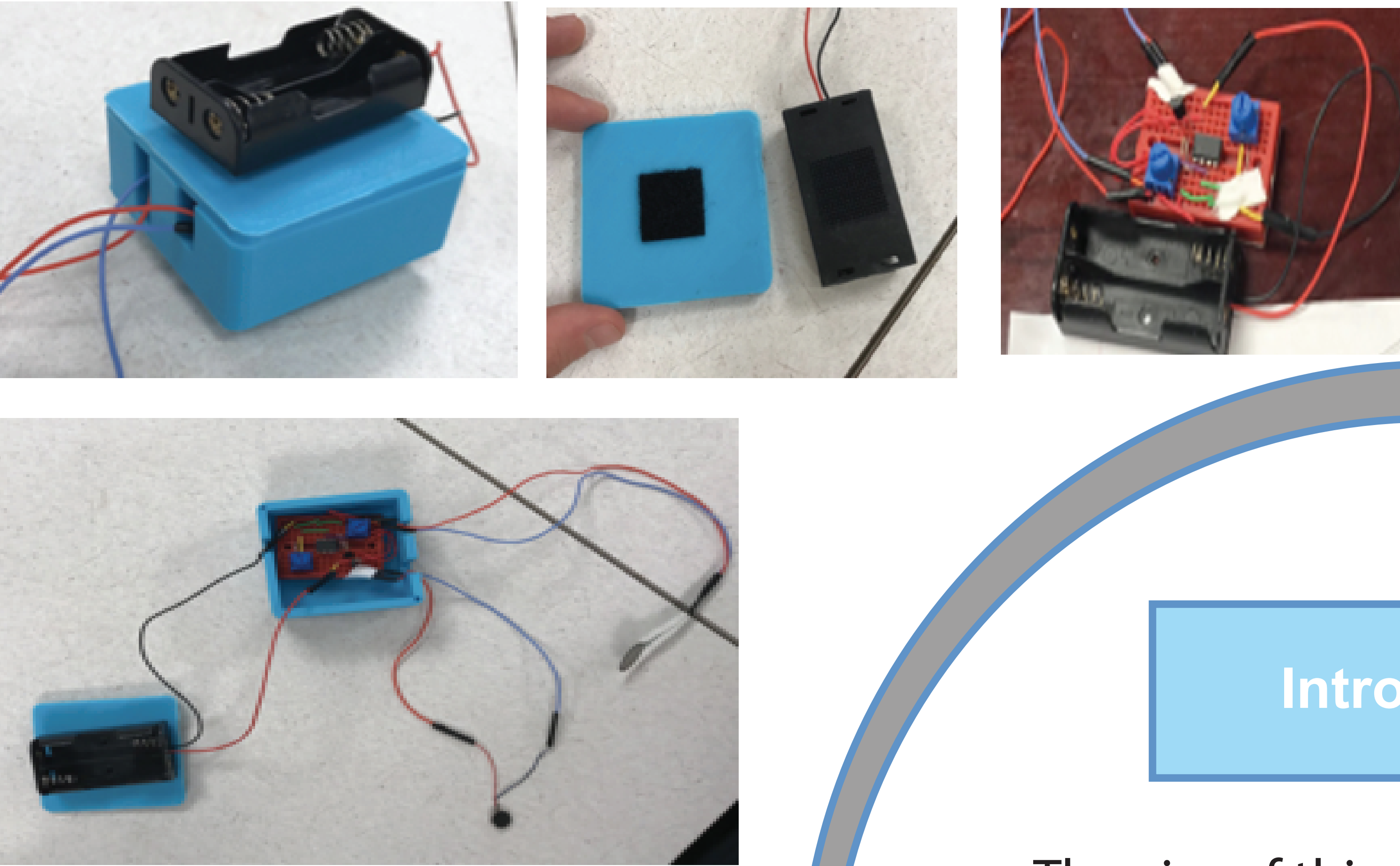




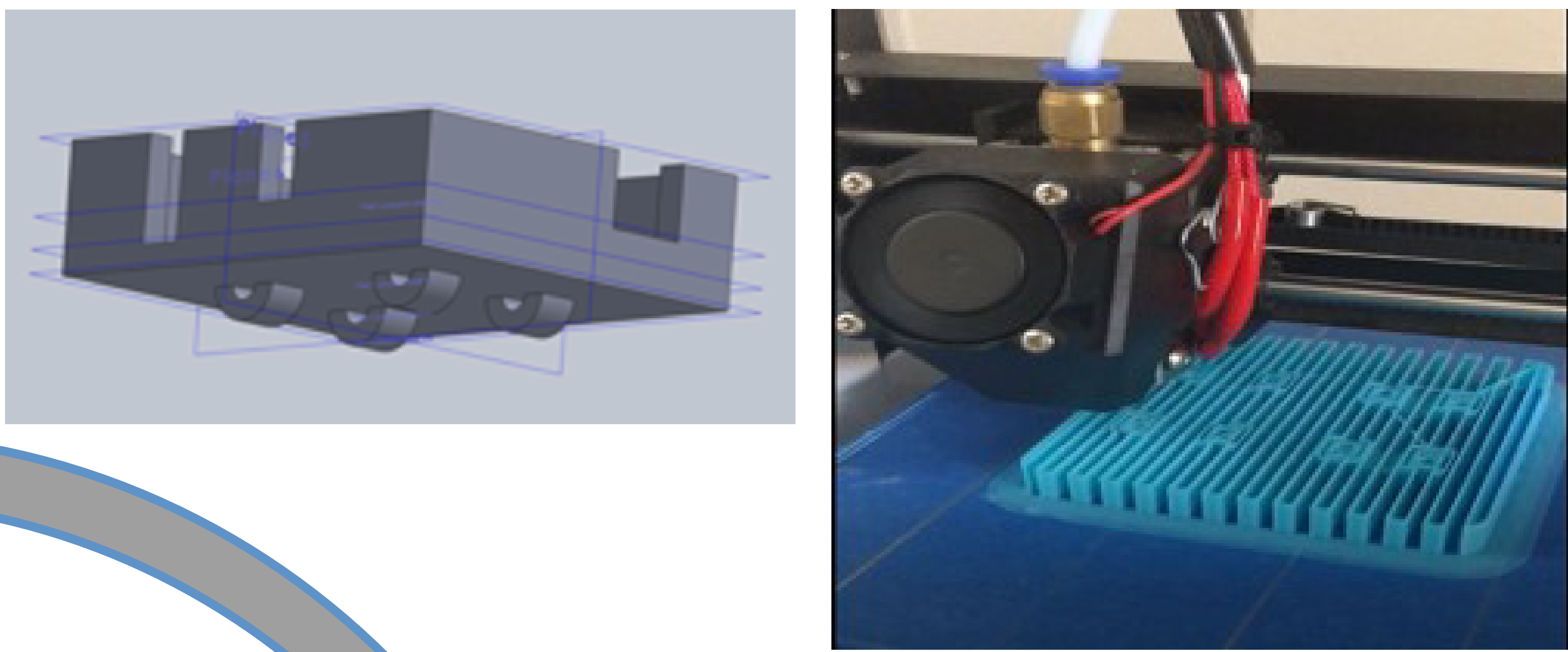
1. Initial Design - General Casing

The 3D printed enclosure for the circuitry was initially designed to have a sliding door top, attachable battery pack and outlets for associated force sensor and vibrating motor.



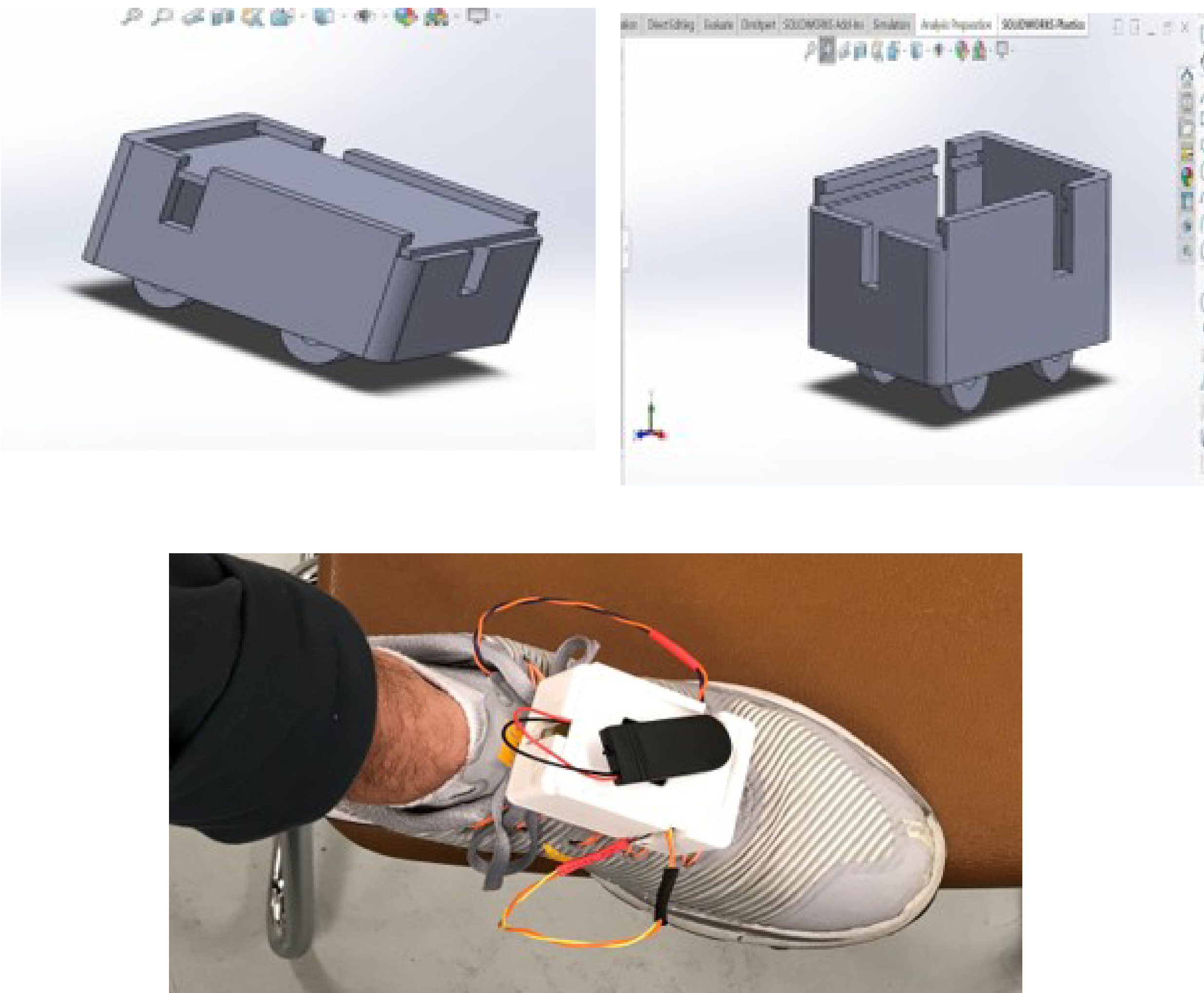
2. Initial Design - Incorporating the Lace Loops

Device mounted on shoe laces with hook mounting system. The design was inspired by wireless tracking devices used in racing events. The intent was to feed shoe laces through the enclosure to ground the structure. The sensor was taped to the user's ankle.



4. Secondary Design- Streamlined Device Casing

The second iteration of the prototype was designed to contain more compact circuitry. Adjusted methodologies for attachment of required sensors and alert motors.



Introduction

The aim of this research project is to design and develop a vibrational feedback device which is convenient and effective in measuring the force output on specific regions of the user's foot, allowing for improved testing of chronic ankle instability.

3.Secondary Design - Ankle Housing for Motor

Improved methodologies for attachment of required sensors and alert motors through the use of elastic ankle strap with inset sensor compartments



5. Ongoing Design - Improved FSR Placement and Modified Insole Design

Custom insole modifications allow for FSR circuitry to run throughout the subject's shoe through the heel, reducing the kinking of wires as well as the disturbance to natural gait patterns of the subject.

6. Future Plans

- 1) Microcontroller used to further decrease the size of the device and its casing. Additionally, more compartments should be incorporated into the elastic ankle strap to allow for housing of the device, moving it off of the user's laces.
- 2) These custom insoles were to be developed in a range of insole sizes (M7-12) in order to accommodate different users