

Combat Food Insecurity

Problem



- Stalk Lodging is a phenomenon where a plant stalk breaks and falls over before it is able to be harvested causing loss of production
- Every year farmers in the U.S lose 5% - 25% of their harvest to stalk lodging

Project Goal

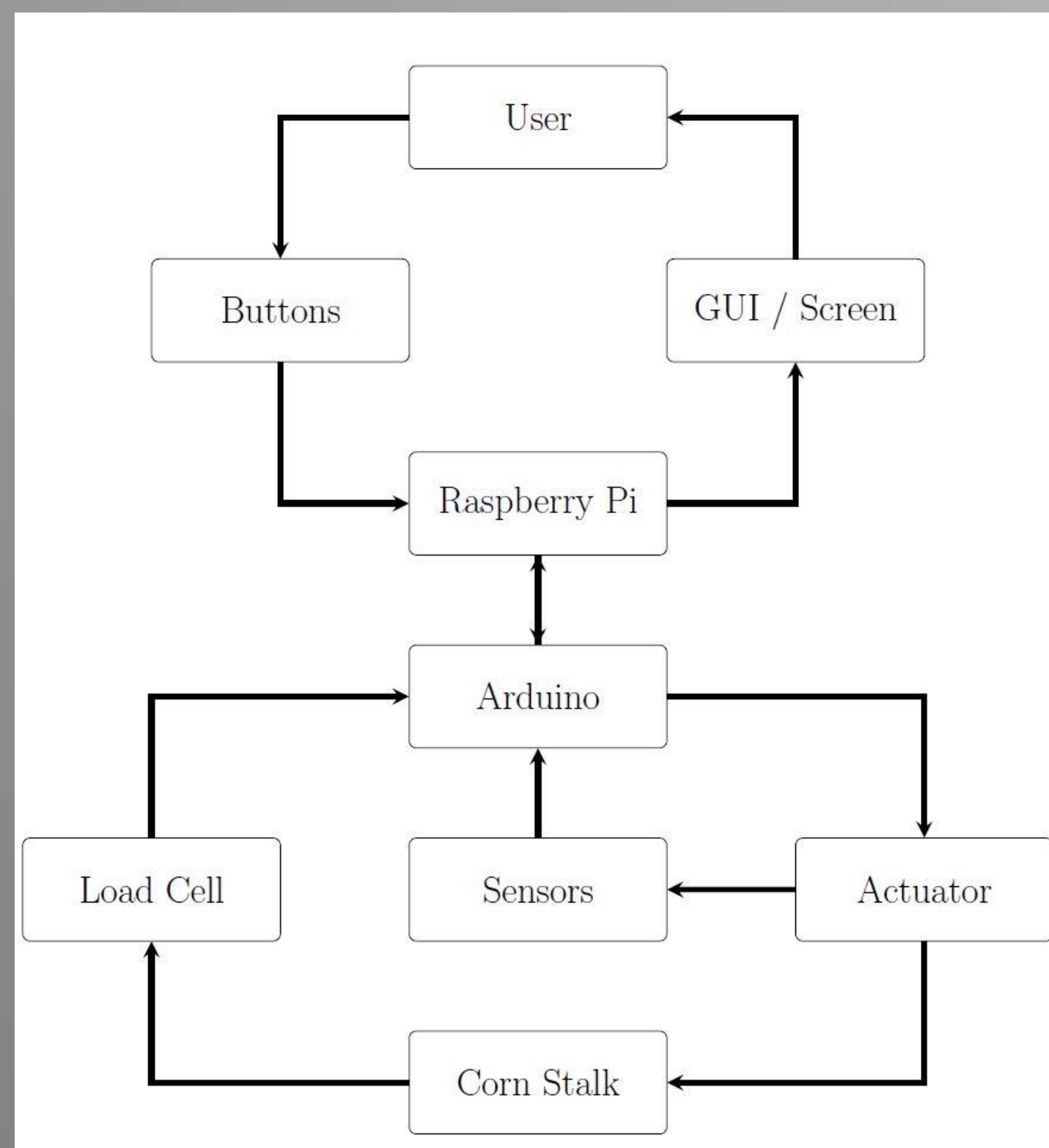
- To create a device that allows plant breeders to accurately measure stalk strength in an economically feasible and high throughput manner so they may breed for stronger stalks to prevent lodging.

Requirements

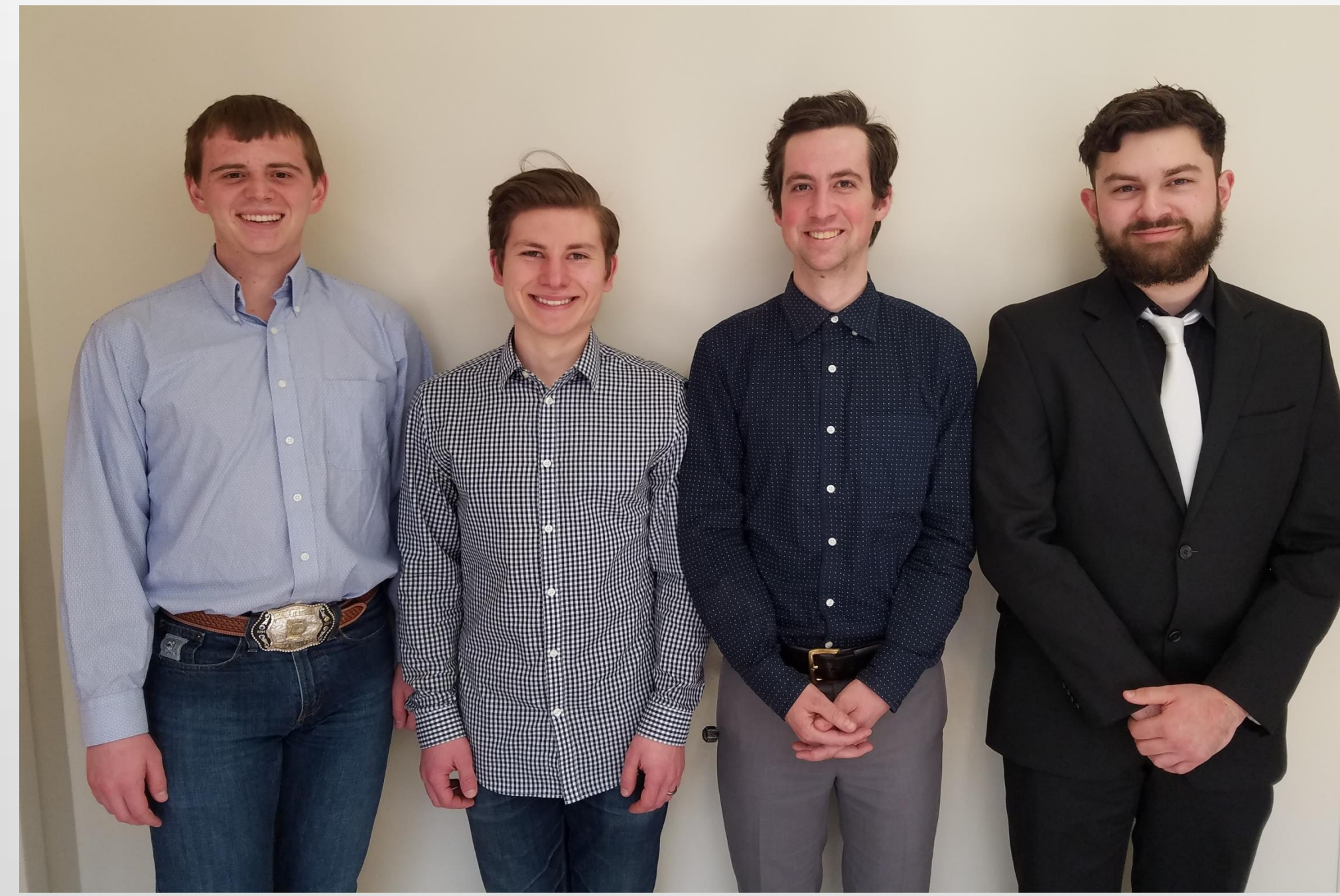
The Device must :

- Measure force data
- Accurately measure distance traveled
- Store and analyze collected data
- Have an accuracy of +/- .01 mm
- Be portable
- Be handheld
- Be durable
- Be affordable

Electronics Diagram

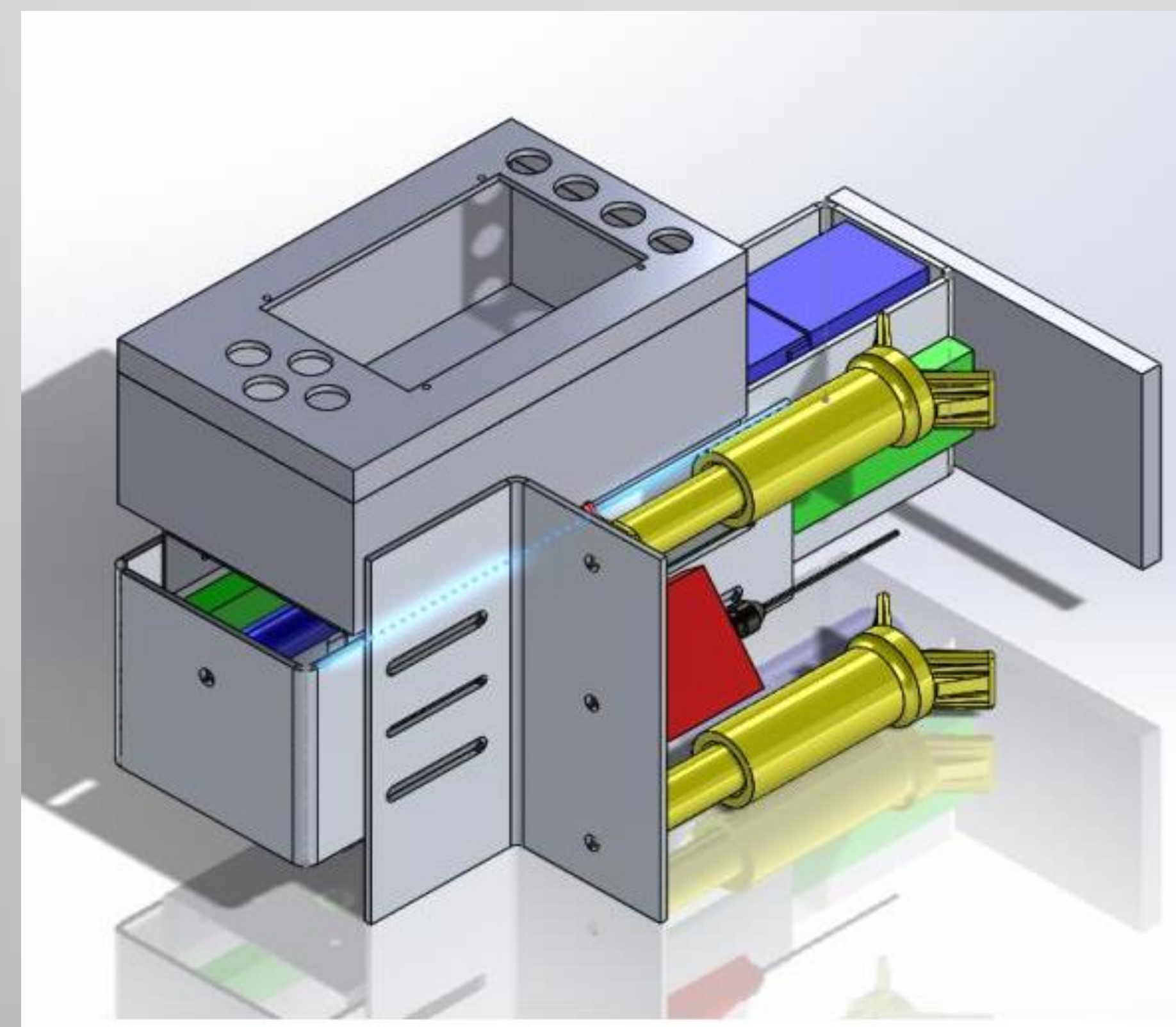


- The diagram shows the progression of data as it is collected and analyzed

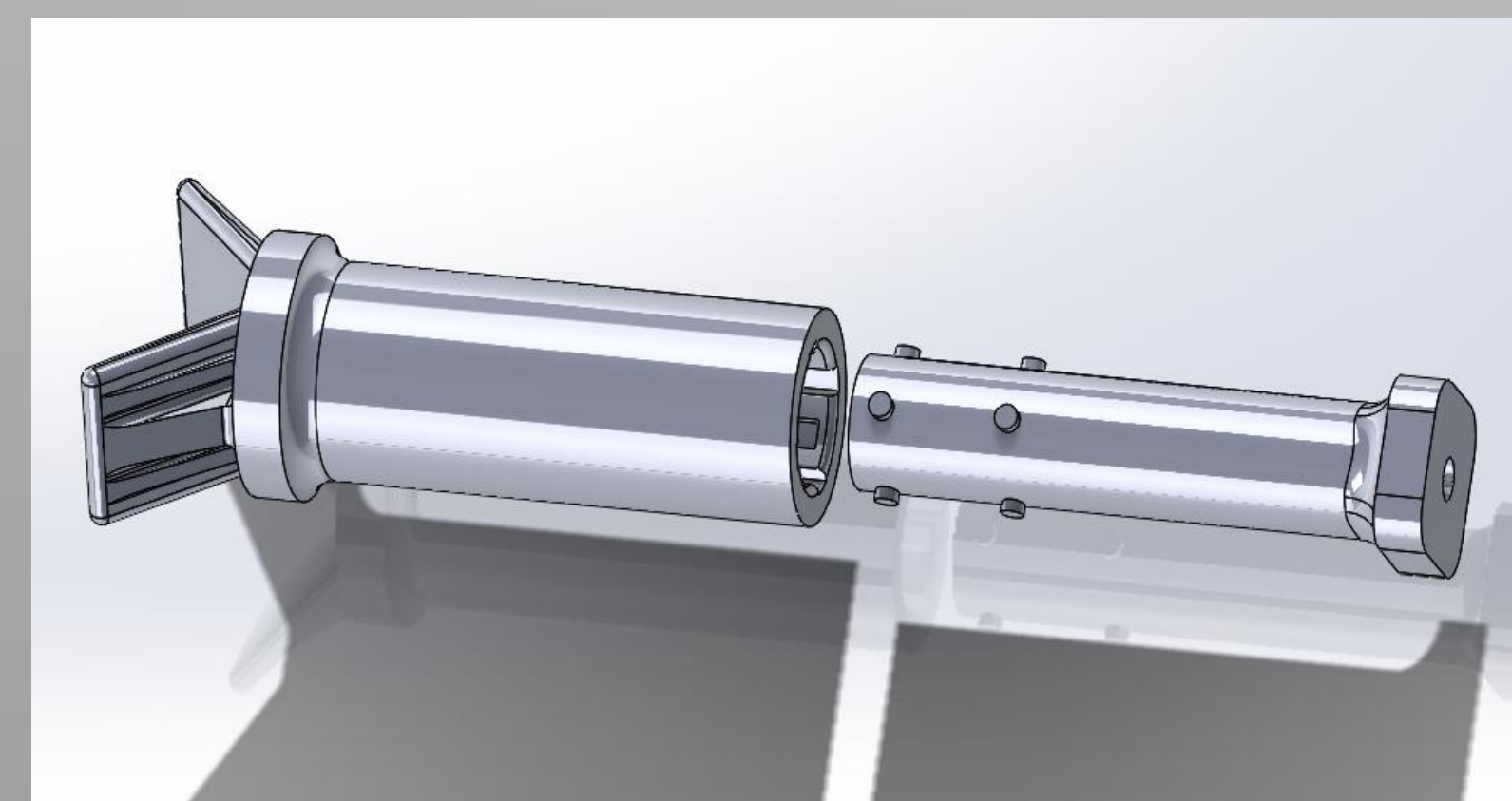


Team Members: Justin Nesbitt, Drew Owens, Josh Warnick, & Spencer Hauck

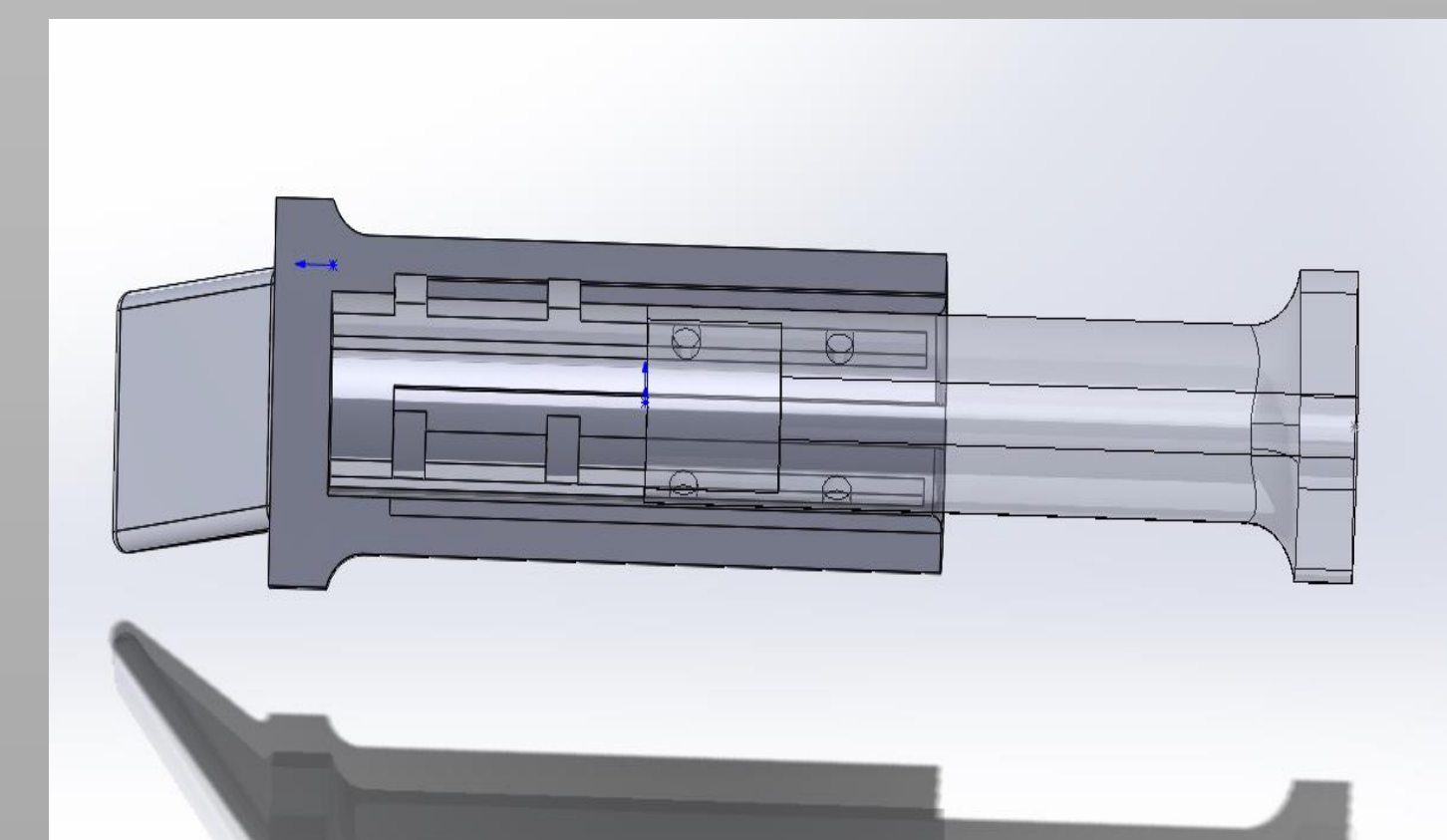
Design



Stalk Holder



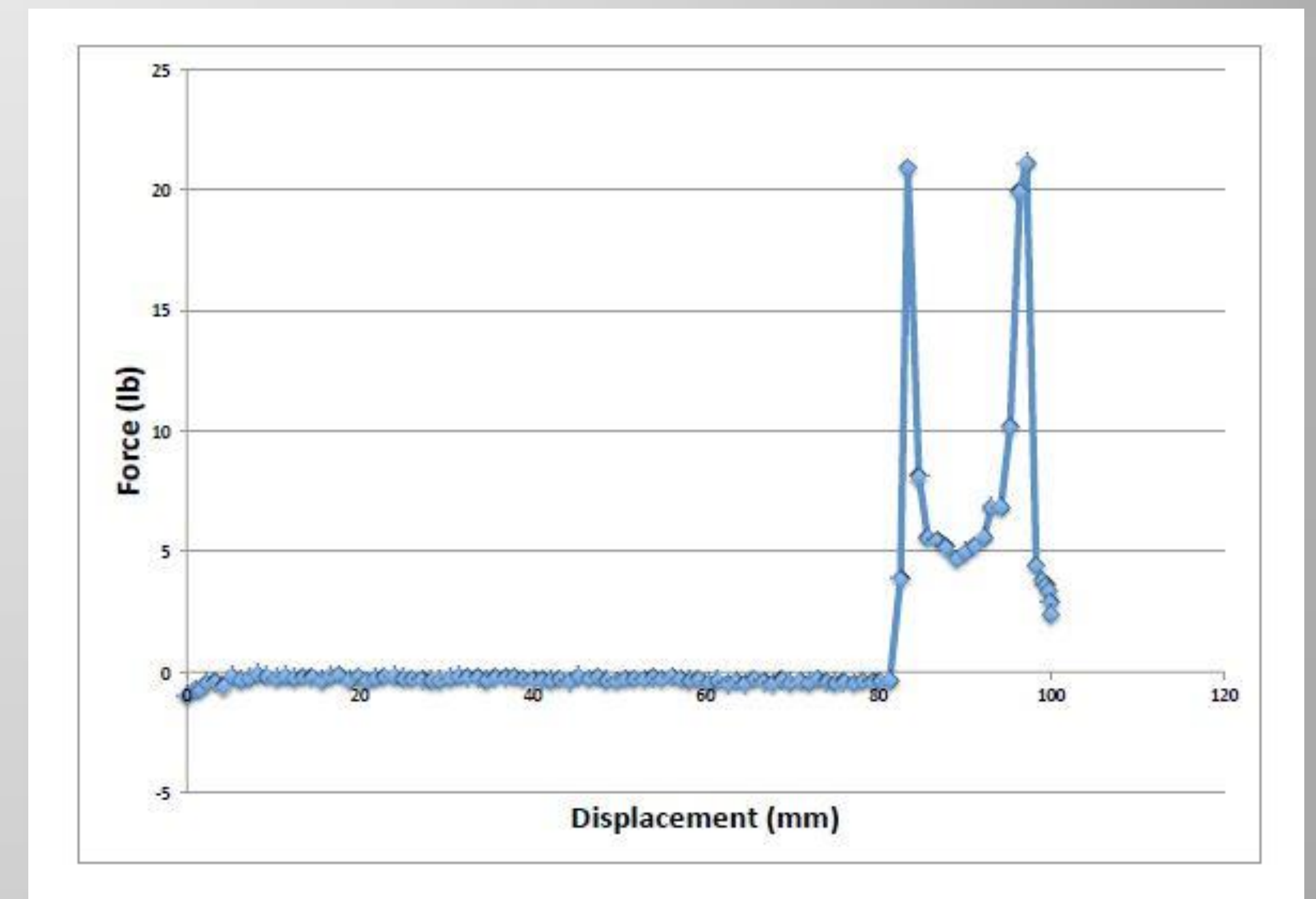
Exploded View



Cross-Sectional View

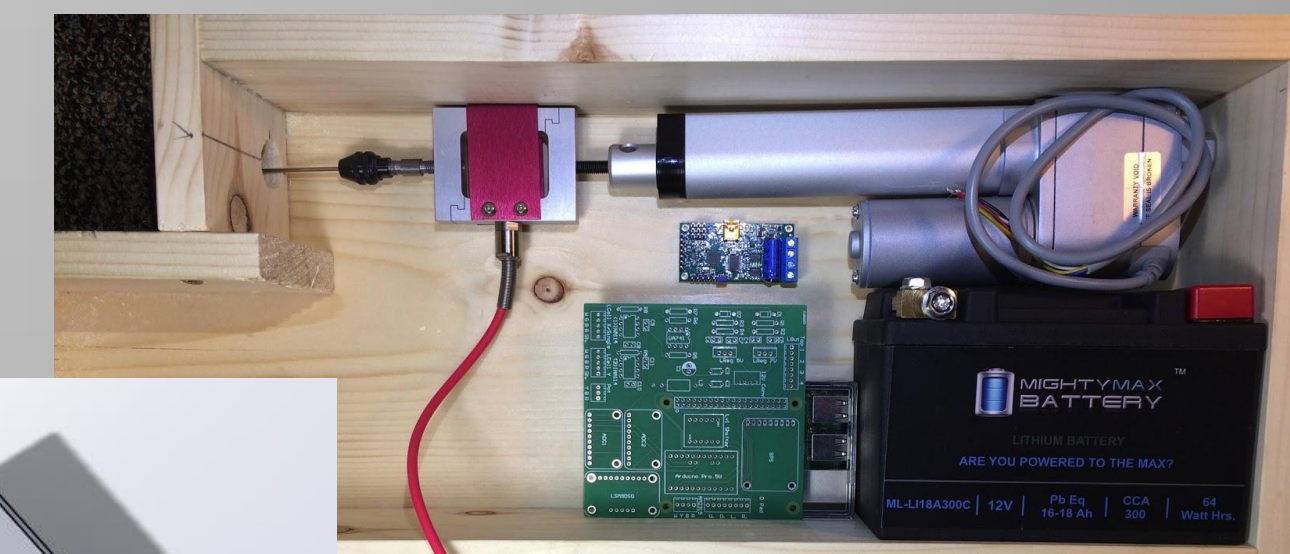
- By using tabs and a spring held in compression the two components of the stalk holder are held together and able to move linearly

Testing

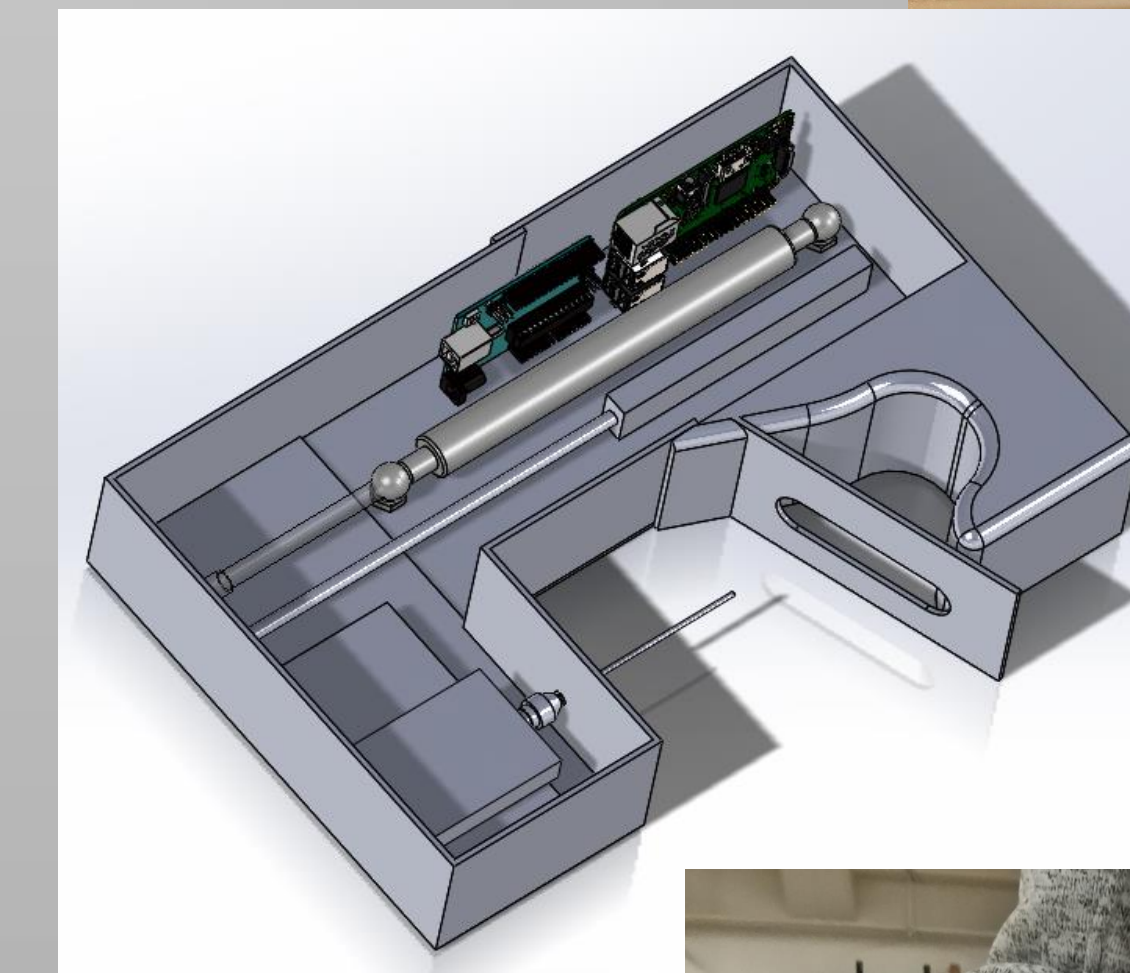


Project Learning

First Iteration



Second Iteration



Third Iteration



Moving Forward

For the next iteration the next step will be to:

- Find a different Load Cell
- Update the PCB
- Add Auxiliary Sensors
- Refine the Algorithms
- Streamline the Design
- Explore a Manual Powered Design