F6-Plasticity Modeling

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ME486C

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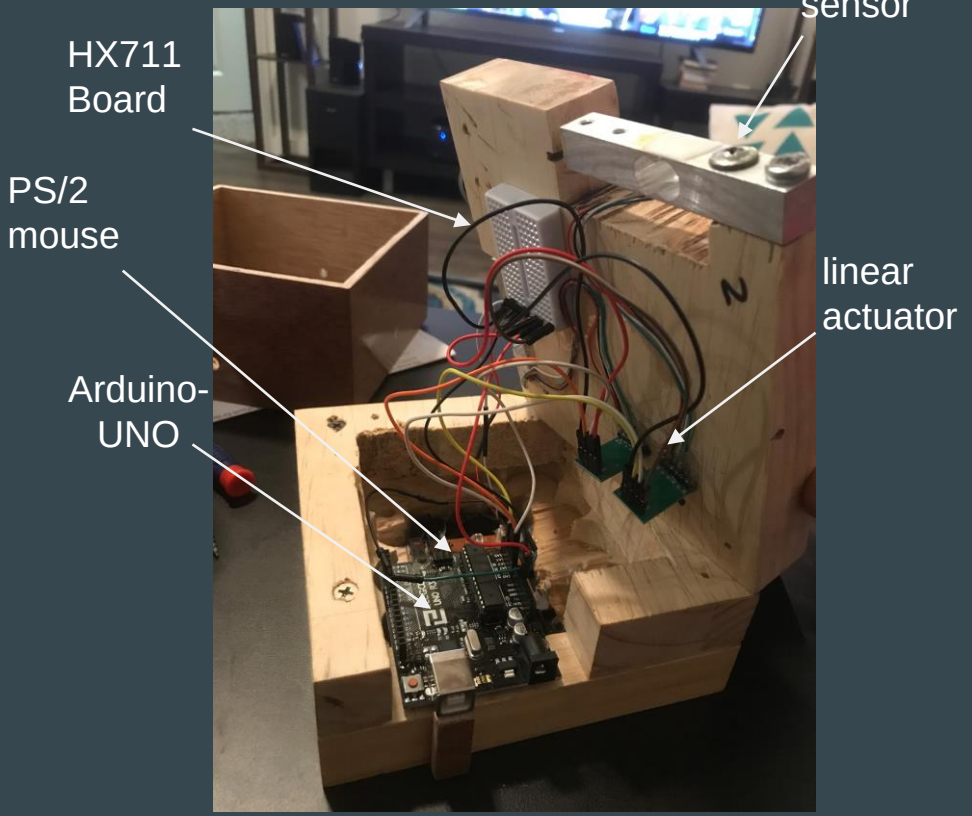
Project Description

- Our project is to design an experimental device that would help measure the force vs. displacement applied to a box.
- The box will be attached to springs connected to the surrounding walls, which will act as resistors to the force applied.
- A USB cable will be used to illustrate the data in forms of graphs.



Hardware Review 2

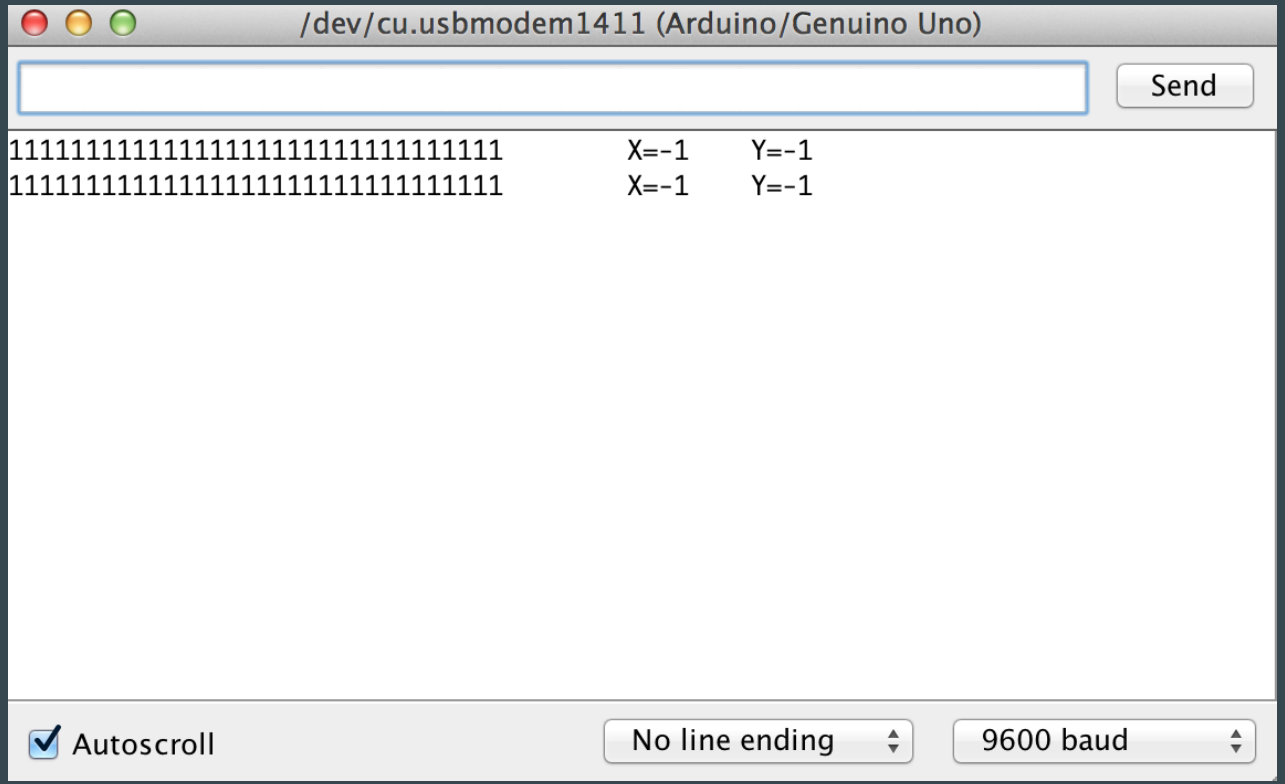
- The system will work basically by pulling or pushing the box a certain amount of force and distance by the student. It’s an Original System.
- The output result will calculate both forces and displacement and the graph generate it will be always the add up for both forces and displacement.

Problem found:

The team is struggled with running the codes, because each time we run we get ones and sometimes zeros and that took about 30 sec. to send the signals.

The team think 75% from the error we have is from the codes, however 15% is because we are using the PS2 mouse.

Output results



Updates

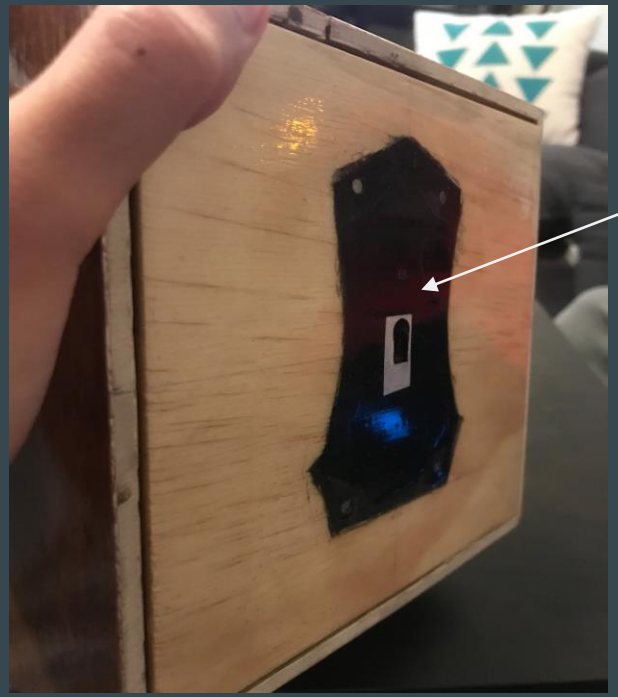
Since the last presentation that team tried very hard when manufacturing the design to have it as what it was in the prototype with a major changes in terms of the electrical component.

- The old sensors:

1) LM393
2) BMP180
3) Force Gage

- The new sensors:

1) ANDS-3050 Optical mouse sensor
2) Electronic Weight Sensor load Cell
3) HX711 Weighing sensors 24BIT



Updates

We made changes that will satisfy the customer requirements and increase the accuracy and efficiency of the design.

Now:

- We chose an optical mouse instead of a laser mouse based on an analytical report we did. Which was proven to be more accurate than laser.
- We changed the size of the design, from a rectangular shape to a square.

Improvements:

1) Adding rubber sheet to the bottom of the base to prevent the system from moving when it's over the tabletop.
2) Adding blocks, so instead of pulling the spring itself, the student will pull the block to prevent error.

3) Testing Procedures:

- Test and calibrate the weight sensors. Using a scale, and a known weighted object.
- Measure displacement using a ruler and comparing it to the data.

Moving Forward ...

- The manufacturing process is done, but if any of the sensors didn’t work properly during the testing procedures, it will require a replacement to a more compatible parts.
- Omar and Nawaf will be working on figure out the wrong codes and fix it as well as the equations that needs to be in there, while Mutairan and Abdullah will be working with the wire if needs to be change and take care of exporting the data from the Arduino to Excel

The only thing that the team has to work with:

- Coding the sensors to make it work as we need. Using LabVIEW to export data.
- Figure something out to carry all the things in the top of the base.

Contingencies

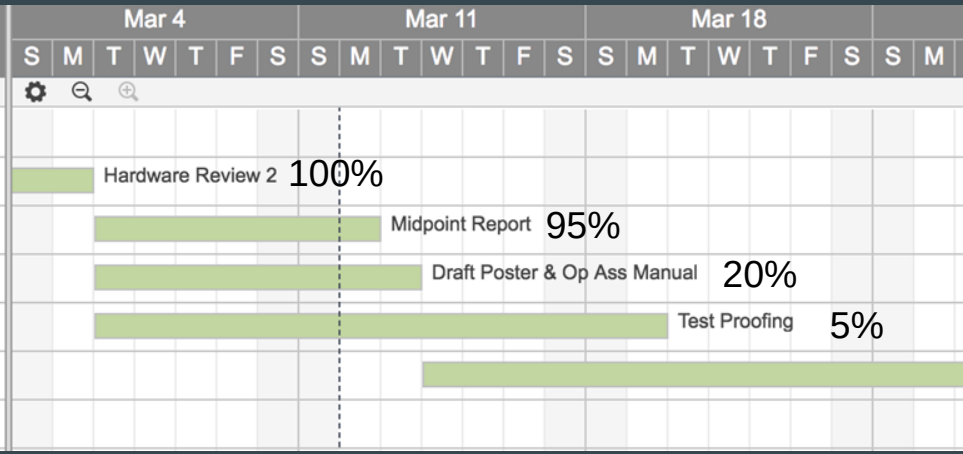
- The only issue we're facing is getting reading from the mouse. So to get that to work it would require time and effort, possibly money too.
- If everything goes wrong, we'd have to switch the mouse in use and try to get it to work.

Schedule:

- Mid-point Report. (3/14)
- Work on code. Combining the sensors and generating graphs. Before(4/13)
- UGRADS Poster. (4/14)
- CAD Package. (5/1)
- Final Report. (5/1)

Schedule

	Task Name	Start	Finish	Assigned To
1	Hardware Review 1	01/15/18	02/05/18	Nawaf & Mutairan
2	Hardware Review 2	02/06/18	03/05/18	Mutairan & Abdullah
3	Midpoint Report	03/06/18	03/12/18	Nawaf & Omar
4	Draft Poster & Op A	03/06/18	03/13/18	Mutairan & Abdullah
5	Test Proofing	03/06/18	03/19/18	Team
6	Poster & Op Ass	03/14/18	04/04/18	Mutairan & Abdullah
7	Final Report & CAD	04/05/18	04/25/18	Nawaf & Omar



The team decided to split up the work in half, were at least two members are working on a single task. We are currently ahead of schedule.

Budget

Budget Available $500 - $2000

Total Expenses to date = $135.58

Any additional expenses could go to buying a new Optical PS2 Mouse. “Personal System/2”

Major changes:

1- Sensors used.

2- Size of device.

Item	Quantity	Cost
Arduino	1	**$34.99**
Spring	1	**$12.99**
Arduino Programing	1	**$7.99**
Sensor Shield	1	**$5.29**
Stainless Steel Ring Screw Hook	10	**$6.64**
8/20 Aluminum axials	2	**$20.99**
Sensor Shield expansion board	1	**$5.49**
Box	1	**24.92**
Wires	1	**$7.29**
Optical PS2 Mouse	1	**$8.99**
Total		**$135.58**

Thanks for Listening

- Any questions or concern?