

Meeting Minutes 1/11/18

Library 132 @ 3:30

Review of Break

- Presentation of new Prototypes

Plan Moving Forward

- Switch Designs to a Backbone Design

Adjourned 4:30

Action Items

- Pursue Designs – Spencer, Josh, & Justin

Meeting Review

- This was a great meeting where we just got back from break and were able to come up with new ideas to pursue

Meeting Minutes 1/18/18

Library 132 @ 3:30

Review of Break

- Presentation of new Backbone designs
- Machine shop may be able to bend 1/8 aluminum

Plan Moving Forward

- Make sure we have all Electrical Components
- Re-machine thread adapters
- Order Metal
- Confirm that the Machine shop can bend metal
- Start a Matrix evaluation of the 3 designs
- Design Review Feb. 9th
- Register for Expo
 - 50 word abstract
- Pursue Designs

Adjourned 4:30

Action Items (All Due Monday)

- Make sure we have all Electrical Components - Drew
- Re-machine thread adapters - Josh
- Order Metal - Josh
- Confirm that the Machine shop can bend metal - Josh
- Start a Matrix evaluation of the 3 designs - Justin
- Register for Expo – Drew
- 50 word abstract - Justin
- Pursue Designs – Spencer, Josh, & Justin

Meeting Review

- This was a great meeting where we just got back from break and were able to see what we had accomplished over break and see exactly where we stood starting the new semester.

Meeting Minutes 1/25/18

Library 132 @ 3:30

Review of Action Items

- Started Soldering
- Spencer is now shop trained
- Design Review scheduled Feb. 9th @ 12:00 pm
- Developing Machining Plan
- Calculated Forces for Hand Powered Design

Design Review

- Working Prototype of 3 designs
- Testing Data

3 Prototypes of Designs

- AutoCad Drawings done by 1/29
- Submit to Facilities – 1/30
- Gather Hardware for Designs – 2/1

Electronics

- Solder Parts – 1/29
- Get Standoffs – 1/29
- Raspberry Pi is attached
- Make sure Electronics can Interface
- Confirm Data Processing
- Program Arduino Pro Mini – Thursday

Adjourned 4:30

Action Items (All Due Monday)

- Reserve a room for Design Review - Josh
- Pursue Designs – Spencer, Josh, & Justin

Meeting Review

- This meeting was a great show of progress and our continued progress is a great sign that we are building momentum and getting things done in a timely manner

Meeting Minutes 1/29/18

Gauss-Johnson Lab Rm 114 @ 4:30

Review of Action Items

- Soldering is Complete
- We have Standoffs
- Prototype Files are ready to be submitted to Facilities

Adjourned 4:50

Action Items

- Prototypes done – 2/8
- Electronics assembled – 2/8
- Need to order a new Adapter – Josh & Drew
- Send Action Items to Dr. Robertson – Justin

Meeting Review

- This was a quick meeting where we mainly reviewed our deadlines and critiqued our designs before we submitted them to Facilities for machining

Meeting Minutes 2/1/18

Library 132 @ 3:30

Review of Action Items

- Soldering is Complete
- Still need to make sure the Electronics can interface

Design Review

- Working Prototype of 3 designs
- Testing Data
- Create PowerPoint - Justin

Electronics

- Redesign board for wave soldering
- Look into switching to Arduino mini
- Look into Redesigning PCB

Prototypes

- Drill Holes for Hand Powered Backbone – 2/6
- Check deflection of Backbone Designs
- Finish Machining Prototypes

Adjourned 4:30

Action Items

- Prototypes done – 2/8
- Electronics assembled – 2/8
- Need to order a new Adapter – Josh & Drew
- Send Action Items to Dr. Robertson – Justin

Meeting Review

- This meeting really showed that it was crunch time and that if we wanted to accomplish our goals for our design review we had a lot of work to get done in a short time.

Meeting Minutes 2/15/18

Library 132 @ 3:30

Review of Action Items

- Holder Design Created
- Offset Design Created

Mechanics

- Offset Designed needs to be modeled in Solid Works
- Get CDA metals build Quote

Electronics

- Need new load cell
- Look into why battery didn't work (melted)

Adjourned 4:32

Action Items

- Offset Prototypes modeled– 2/22 – Josh
- Get CDA Metals quote – 2/22 – Josh
- Upload Potentiometer worksheet – 2/22 – Justin
- Look into different linear slides – 2/22 – Justin
- Find a new smaller load cell – 2/22 - Justin
- Get Matlab Script – 2/22 – Drew
- Discover why battery melted – 2/22 – Drew
- Test potentiometer pins in PCB -2/22 –Drew
- Model and 3D print Cornstalk Holder designs – 2/22 - Spencer
- Send Action Items to Dr. Robertson – 2/16 – Justin

Meeting Review

- At this meeting we reviewed the designs we had created during the week before and made any quick adjustments we could think of to the designs before we made plans to have them modeled so that we could send them out to be built by U of I facilities or CDA metals. We also have spent time talking about where we stood with regards to our electronics design and implementation.

Meeting Minutes 2/22/18

Library 132 @ 3:30

Review of Action Items

- Update of where Electrical component design is
- Offset Design Created

Mechanics

- Report on different linear motion devices
- Looking into different Springs
- Waiting to hear from CDA metals about quote
- Fixing Models for U of I facilities

Electronics

- Still working on previous action items
- Work will be stalled for a week as Drew will be out of town

Adjourned 4:40

Action Items

- Offset Prototypes built– 3/8 – Josh
- Get CDA Metals quote – 2/29 – Josh
- Get Matlab Script – 3/8 – Drew
- Test potentiometer pins in PCB – 3/8 –Drew
- Update Stalk Holder Design - 3/8 - Spencer
- Send Action Items to Dr. Robertson – 2/16 – Justin

Meeting Review

- Due to Drew getting sick our Electronic design progress was not as far along as we were hoping. Also because Drew will be gone the next week for a family trip progress will continue to be slow for a little longer. However on the mechanical side of things, progress continues, we have created new iterations of the stalk holder and are waiting to hear back from CDA metals on a quote and as soon as we get that we will send in our model to be built.

Meeting Minutes 3/8/18

Library 132 @ 3:30

Review of Action Items

- Offset Design Review
- Review of Stalk Holders

Mechanics

- CDA metal parts will be ready tomorrow

Electronics

- No load battery lasts 18 hours
 - AA batteries
- Test full load tomorrow
- Looking into bottleneck issue
- Get touchscreen and PCB hooked up

Adjourned 4:20

Action Items

- Work on bottleneck issue
- Try and cut Arduino over spring break

Meeting Review

- We are once again making good progress in both the electrical and mechanical parts of the project. We were able to answer some important questions regarding how long our batteries will last, which in turn affects design. We should have our parts back and assembled before break so that we can start hooking everything together.

Meeting Minutes 3/22/18

Library 132 @ 3:30

Review of Action Items

- Offset prototype Review
- Review of Stalk Holders
- Review of Electronics

Mechanics

- Design is complete, just need to make it easier to use
 - Next iteration needs tighter tolerances
 - Add brackets for electronics box
 - Add brackets to attach stalk holders
 - Add back plate
- Need different spring for stalk holder
 - Current spring is too strong

Electronics

- Start testing as soon as possible
- Get circuit design cleaned up

Adjourned 4:20

Action Items

- Add handles to prototype – 3/29 – Josh
- Figure out Expo needs – 3/29 – Justin
- Find new load cell – 3/27 – Justin
- Get weaker spring for Stalk Holder – 3/27 – Spencer
- Start testing data collection – Drew
- Connect electronics to sensors – 3/27 – Drew

Meeting Review

- This was a good meeting as it allowed us to see the how far our prototype has come and where it still needs to go to be useable in the field. We have the frame complete with load cell and actuator in place. Now all that is needed to make it work is attaching the electronics. However we are not done yet as we still need to attach the stalk holders and handles. So overall this meeting was a boost in confidence of what we had accomplished will showing us what still needs to happen quickly before Expo.

Meeting Minutes 3/29/18

Library 132 @ 3:30

Review of Action Items

- Offset prototype Review
- Review of Stalk Holders
- Review of Electronics

Mechanics

- Stalk Holders and Back plate attached to prototype
- Handles Added

Electronics

- Start testing as soon as possible
- Screen and Buttons ordered
- Electrical Case ordered

Adjourned 4:43

Action Items

- Get picture of Prototypes - 4/5 - Justin
- Fix stalk holder – 4/5 – Spencer
- Get Screen and buttons connected to prototype

Meeting Review

- This meeting was our last planning session before the last big push for expo. We planned out what needs done still and what needs to happen when as well as the requirements for Expo. We are getting close to having all the mechanical parts assembled, and just need to finish getting the electronics finished and attached.

Meeting Minutes 4/5/18

Library 132 @ 3:30

Review of Action Items

- Offset prototype Review
- Review of Stalk Holders
- Review of Electronics

Mechanics

- Stalk Holders still binds
- Clean up design
- Cut electronics box to fit the screen and the buttons
- Move brackets to inner U frame

Electronics

- Still looking for bottleneck
- Trying to get buttons to work correctly

Adjourned 4:36

Action Items

- Get Motor Controller hooked up
- Put electronic components into box and attach the box to the prototype frame
- Fix stalk holders

Meeting Review

- We are beginning the final preparation for the Expo. Everything is getting assembled into one device and we are almost to the point where we can test the device on the cornstalks we collected at the beginning of the year.

Meeting Minutes 4/12/18

Library 132 @ 3:30

Review of Action Items

- Offset prototype Review
- Review of Stalk Holders
- Review of Electronics

Mechanics

- Stalk Holders still binds
 - Try eight nubs
- Clean up design
 - Make load cell plate wider and attach stalk holders to it
- Make back plate thicker
- Mount batteries to the frame using snap adhesive

Electronics

- Rework button layout

Adjourned 4:27

Action Items

- Get Motor Controller hooked up
- Put electronic components into box and attach the box to the prototype frame
- Fix stalk holders
- Get bigger handles

Meeting Review

- At this meeting we are getting close to having our device operational and ready to be tested. We are continuing to gather all our material for Expo and the final paper due afterwards. We still have been unable to start testing the finished device, however we have tested the fact that it will operate, but still haven't been able to test our data gathering capabilities.

Meeting Minutes 4/19/18

Library 132 @ 3:30

Review of Action Items

- Offset prototype Review
- Review of Stalk Holders
- Review of Electronics
- Expo presentation

Mechanics

- Final Assembly
 - Make everything look nice
 - Clean up pieces

Electronics

- Review Electronics
 - Everything assembled
 - Batteries attached

Adjourned 4:37

Action Items

- Print Poster
- Prepare Expo Presentation
- Finalize prototype

Meeting Review

- At this meeting we sat down and worked out what we were going to talk about for our presentation and who was going to present. We also worked out what materials we were going to bring to Expo and show off.

Meeting Minutes 4/30/18

Library 132 @ 3:30

Review of Action Items

- Expo
- Expo presentation

Expo

- How did it go

Electronics

- Review Electronics
 - What still needs accomplished

Adjourned 4:03

Action Items

- Fix electronics
- Prepare final paper work

Meeting Review

- This meeting was our chance to go over how expo went and what is expected of us for our course deliverables. We also covered what is information we will need to prepare to pass on to the next team.

Meeting Minutes 5/3/18

Library 132 @ 3:30

Review of Action Items

- Expo
- What happens next

Expo

- How did it go

Electronics

- Review Electronics
 - What still needs accomplished

Adjourned 4:10

Action Items

- Fix electronics
- Prepare final paper work

Meeting Review

- This meeting was a reconfirmation of what is expected to be turned in, as well as what little work we could still accomplish before the end of the semester.

Minutes 9/7/17

Meeting in IRIC room 207 called to order 3:30 pm

Dr. Robertson was present

- Name – Children of the Corn
- Client Interview
 - o Is project designed only for corn?
 - For design purposes the project is only for corn, however could scale for other grain.
 - o Sorghum, what is it?
 - Cross of wheat and corn for animals.
 - Lots of money has poured into corn. It's a high tech crop
 - Sorghum is very similar to corn except more hardy and requires less water.
 - Sorghum is beginning to become popular to feed animals in poorer soils and less water.
 - Mostly researched by universities (public crop)
 - o At the projects 3rd stage of development what will it need?
 - Handheld
 - Data Logging
 - Battery Powered
 - o In 2nd stage using the device do we need to measure to the ground?
 - No, but a certain place must be decided to puncture on all stalks
 - In the corn there are stress concentration points above nodes due to the change in diameter. Also above each node is a growth zone – new tissue grows on the old.
 - Also nutrients will be pulled from stalk when corn ears are maturing.
 - It will probably be best to count down nodes from the ear for the testing point.
 - o One hand or two handed device?
 - One person operation, however that must be done.
 - o How much memory is needed?
 - Only text files are needed so should get by with little memory.
 - o Will insertion angle and velocity be important?
 - We will need to see,
 - Probably 90 degrees insertion will be best.
 - Rate shouldn't be a problem as long as you have fast data collection.
 - Using the needle we can measure diameter and rind thickness
 - o How should we apply the needle?
 - Hand force would be best.
 - However a crank would work.
 - The needle will act as a caliper for outside diameter
 - In the past several different types have been tried

- Blunt, Rounded, or Taper
- Has Lancing been considered?
 - It has been considered but will most likely be too thin and will bend.
 - Nothing was consistent for measuring rind penetration.
 - Peak of graph was not consistent with any one point.
 - With a needle we can find when it starts to penetrate and when it leaves.
 - We will need a plate to reference where back of stalk is.
 - Full penetration because we can get the rind thickness from the second penetration.
 - Bigger moment of inertia – less bend
 - Ad^2
 - Instead of using cross area we could use area under stress curve
 - It works because of material change
 - We can measure inertia this way.
 - BACK MUST BE SUPPORTED
 - Used as a reference to when needle penetrates all the way through.
 - Scale of measurement – millimeters
- Should penetration angle be included in calculation?
 - We'll have to find out
- Will we need to figure out a machining process for the needle?
 - Probably, but we need to talk to the machine shop
 - Length of needle – 1-2 inches
- What is first objective?
 - Get a working prototype
 - Load Cell – We have one
 - Potentiometer (accuracy 100^{th} of a mm)
 - 20 Hz collection rate minimum (50 Hz would be better, higher would be even better)
 - Need to find a corn stalk
 - Dead
 - Whole stock
 - Dryer may be needed
 - No leaves
- How many corn stalks?
 - 5-10 (more is better, 100 would be great)
- When can we get algorithm and documentation?
 - This week

Finished this Week

- Finished writing up Team Contract

Meeting Review

- Accomplished everything on the Agenda and learned more information about the project

Action Items

- Find Corn
- Talk to CALS about finding Dryer
- Read Proposal
- Continue to finish what we did not get done this week

Meeting Minutes 9/14/17

Meeting called to order at 3:30 pm at the library room 132.

- Finished signing the contract
- Budget
 - o Joshua has gone through the preliminary process & knows what needs to be done to get funds when necessary
 - o We have no cap on budget but do not want to spend very much
 - o Items that we believe we will need
 - Linear Potentiometer
 - Load Cell
 - We have one
 - Microcontroller/Software
 - Needle
 - Case
 - Back plate
 - Touch screen
 - Battery
 - Stalks
 - Should be able to get 10, but trying for more
- Gantt Chart
 - o We will use Trello as our Gantt chart
 - o Each member has months of dates to add before next meeting
 - Drew – September & October
 - Josh – November & December
 - Spencer – January & February
 - Justin – March, April, & May

Finished this week

- Signing of Contract
- Initial specs list has been created
- Josh has made contact with finance people and we have access to funds

Meeting Review

- Accomplished everything on the agenda
- Overall this meeting could have been more time efficient

Action Items

- Finish putting due dates into Trello (everyone)

Meeting Minutes 9/19/17 Library 132 @ 3:30 pm

- Look at Trello
 - o Assign a color to each team member
 - Spencer – Purple
 - Drew – Light Green
 - Joshua – Light Blue
 - Justin – Yellow
 - o Minutes and agendas have been added under the date of the meeting on Trello
 - Also includes team documents
 - o Add Dan to Trello Page
 - o Fix notecards with multiple things due
- Start dates will be assigned by the person who is in charge of the task

Adjourned 4:17

Finished this Week

- Gantt Chart has been created and everyone has put in dates
- Drew has set up a Trello account to keep due dates and documents available

Meeting Review

- Accomplished everything on the agenda and reviewed work finished since last meeting

Action Items for next meeting

- List of Specs
- CALS Storage
- Dan access to Trello

Meeting Minutes

Library 131 @ 3:34 pm

Dr. Robertson was present

- Fix Drew's Email address (should be Owen3000@vandals.uidaho.edu)
- Go over check list with advisor
 - o Will type of corn matter
 - Hopefully not – drying may be a problem
 - o Any issues typing a formal proposal to ask for corn?
 - Sounds like a good idea
 - Could talk to CALS to see if they have any samples we could use
 - Could talk to the Agronomy Department for
 - Sorghum
 - Corn
 - Sugar Cane
 - Dryers are around but will take a about a week
- We can store the corn in JML room 83
- Trello board explanation
 - o Access for Dan will be emailed
- Client interview transcript
- Specs (off the shelf products are best)
 - o PCB
 - o Misc. Electronics
 - o Back Plate
 - o Sensors (Temperature, humidity, IMU, GPS, etc.)
 - o Load Cell
 - Supply voltage 5-12 volts
 - o Separate board with voltage regulator
 - Arduino is not the source
 - o Raspberry Pi (microprocessor)
 - o Case
 - o Electric Box
 - o Touch Screen
 - o Screen mounting hardware
 - o Miniature 3 Jaw Chuck (for needle)
 - o Software (user interface)
 - o Code
 - Make sure no issues with license agreements
 - o Needle
- Remember Campus is a great resource
- Should having a working product by December

- 2 times as long to “polish” the working product
- Old group people are also a great resource

Finished this Week

- Turned in Client Interview that was typed up by Spencer
- Justin found a storage place in JML 83 for our corn samples
- A more specific specs list was presented to Dan

Meeting Review

- During this meeting we accomplished everything on the agenda and gained more background information

Action Items

- Talks to CALS about Dryer (Justin)
- Talk to Facility about getting a Quality Encoder/potentiometer
- Get Dan Trello access (Drew)
- Follow up on Storage
- Follow up on existing code/software on the device
- Talk to machine shop about needle

Meeting Minutes

Library 131 @ 3:30 pm

Dr. Roberson was present

- Client interview corrections
 - o The specifics of where nutrients are drawn from the plant is unknown – assume from everywhere
 - o Meristem (growth plates) above nodes is where growth happens
 - o Needle shape- spherical works, but it crushes the sample and we are going for least amount of damage possible
 - o Needle length – must be long enough to go through corn stalk and fit in a chuck (3” will probably do it)
- Email clarifications for Dr. Wolbercht about linear scale/potentiometer needed from Dan
 - o With regards to potentiometer/linear accelerometer
 - Stroke length 3” – 4”
 - Would prefer real time, but not “real” time (shows change in graph as you press the needle)
 - o What are the limits to the rate of data collection?
 - Unknown
 - o Does force and position need to be measured at the same time?
 - Yes
- Needle design will not be a problem
 - o 2 mm stock – likely to cost \$1.25
 - o Experimentation should not be a problem
- 200 stalks of a popcorn variety have been collected
 - o 50 more of sweet corn coming
 - o Need to get them all dried – will take at least a week probably
- Specs turned into lead instructor
 - o Added Battery
 - o Added Cords
 - o Could a Raspberry Pi called Beagle Bones replace Arduino and the normal raspberry Pi?
 - Probably – will have to experiment with that
 - o Could USB connection be replaced with Bluetooth
 - Preferably not – it’s easier for the user and to update with a USB port
 - o With regards to user interface
 - Use same project code as before
 - o Is there a script for software updates?
 - Yes check the google page
 - Version 1 & 2 didn’t have ability to update, but from version 3 on they all could be downloaded from the USB port
 - Old device in Dan’s office is available for study

- Start making mechanical models
 - o Use existing devices to see how to actuate & prevent binding of our prototype
- Start making needles to see functionality
 - o Look at other ways to apply force besides human power

Adjourned at 4:22 pm

Finished this Week

- Spencer has made contact with Dr. Wolbercht in order to find a potentiometer for our project
- Drew has found 200 stalks of popcorn corn and Justin has found 50 more
- Everyone helped strip the leaves and store the stalks
- Final edited specs were turned in to Dan

Meeting Review

- During this meeting we were able to accomplish everything on the agenda and learn more about what the project has accomplished in the past and where to go with it as we continue to work on it

Action Items

- Have some models by next Thursday (10/5) (all)
- Find out about training for machine shop, 3D printer, and laser cutter (Josh)
- Get Raspberry Pi (Dan)
 - o Come into office to get it (Drew)
 - o Available in afternoons
- Pick Up load Cell (documentation is available on website)

Meeting Minutes

Library 131 @ 2:30 pm

- General Housekeeping
 - o Need to keep Wednesdays meeting short (under 20 minutes)
 - o Portfolio is due as well as personal logbooks
 - o Portfolio needs to include
 - Minutes/Agendas
 - Client Interview
 - Specifications
 - Budget
 - Goals/Needs
 - o Due Dates
 - December 1st – working prototype that includes
 - Needle with Load Cell
 - Touch Screen
 - Built product
- Prototype needs
 - o Mechanical
 - Needle – machined
 - Chuck – Bought?
 - Load cell – have
 - Mechanism for movement
 - Back plate/alignment
 - Case
 - o Electronics
 - Become familiar with existing code
 - Sensors
 - GUI
 - Arduino
 - Raspberry Pi
- Needle Needs
 - o Get Shop Certification
 - o Machining plan
 - o Order stock
- Brainstorming for Back Plate
 - o Strap
 - o Solid Plate
 - o Actuators
 - o Dampeners
 - o Rotating Back Plate

Adjourned at 3:20 pm

Finished this Week

- As individuals and a team we brainstormed what we think our device should look like/how it will accomplish what it is supposed to
- Josh has made contact with the Machine shop and is working on setting up a time to get everyone certified for the shop

Meeting Review

- This meeting was a preparatory meeting for Thursday so that we, as a team, could sit down and share our ideas and make sure we have everything Dan wants ready

Action Items

- Have some models by Thursday (10/5) (all)

Meeting Minutes 10/4

Meeting held at EP 324A @ 2:30 pm

Dr. Wolbrecht was present to talk about potentiometers

Joshua was unable to make it

- Load Cell possible issues
 - o Amplification
 - o Need Bridge circuit – will want to purchase
- Possible solutions to our needs as explained in email correspondence
 - o Linear actuator with liner feedback
 - How accurate?
 - Higher cost = higher accuracy
 - Could set actuator to only read from a certain point to a certain point
 - How accurate do we need to be?
 - o +/- 10 micrometers
 - o Linear Coder
 - Counts revolutions
 - Would have to go with an absolute coder or would have to go to an boundary to set it as zero every time the coder was turned on
 - o Servo Motors might work
- Research different options
 - o Calling companies will be easiest
 - Look at PI – USA
 - o Force applied will be limiting factor
 - o Know the needs to be met
 - Lightweight
 - Energy Saver (must be able to run at least 8 hrs.)
 - High Accuracy
 - 3" stroke length
 - Needs to measure Force

Meeting Review

- The sole purpose of this meeting was to learn more about what we could use as a potentiometer from Dr. Wolbrecht, and he gave us many new options to look at

Action Items

- Research different motor/reading devices

Meeting Minutes 10/5

Meeting held at Library 131 @ 3:30 pm

- Review of meeting with Dr. Wolbrecht
 - o Force less than 50 lbs.
 - o Most will be around 20 lbs. of pressure
 - o Faster is better (less than 30 seconds)
- Battery Concerns
 - o May need to switch to a battery pack from a power pack
- Actuator is self-contained – good idea
- Bigger is not better – try to keep device small
- Load cells
 - o S-curve
 - o Pancake?
 - Reason for current load cell is durability and easy access to wires
- Look at actuator costs
 - o Look at continuous run time
 - o Speed
 - o Force avg. 15 lbs. max of 50 lbs.
 - o Power needs
- Look at advantages vs. disadvantages list
- Need to make sure we can collect data fast enough
- Need to start prototyping

Adjourned 4:34 pm

Meeting Review

- Overall this meeting was a great way to pool our knowledge and find out what information we still need to gather to make a decision and make that decision.

Action Items

- Research different motor/reading devices (Josh)
- Make a decision on how device will operate (Team)
- Start Prototyping

Meeting Minutes 10/5

Meeting held at Library 131 @ 2:30 pm

- Drew will be doing an analysis of actuator vs. manual
- Snap Shot Requirements
 - o Problem Definition
 - o Project Learning
 - o Support Material
 - o Poster Board
- Stalks are drying
 - o 40 degrees above ambient
- Portfolio is done
 - o Needs cover
 - o Need to bring old device and software to snap shot day
 - o Diagrams
 - Need brainstorming diagrams
- What should go on poster board?
 - o Problem Statement
 - o Descriptive Project Title
 - o Target Specs
 - o Project Goals
 - o Design Goals
 - o Timeline
 - o Brainstorming sketches
 - o Poster board
 - Will assembly in GJ 108

Adjourned 3:15 pm

Meeting Review

- Great meeting to touch base for the upcoming Snap shot day and portfolio that is due the next day. We were able to quickly hash out what needs done and who would do it.

Action Items

- Decision on how device will operate – Drew
- Snap Shot Day
 - o Problem Statement – Spencer
 - o Descriptive Project Title – Spencer
 - o Target Specs - Spencer
 - o Project Goals - Drew
 - o Design Goals – Client Interview (Josh)

- Timeline – Drew
 - Brainstorming sketches - Everyone
- Poster board – Justin
 - Assembly – Justin
- Bring Device to Snapshot Day – Drew

Meeting Minutes 10/12

Meeting held at Library 131 @ 3:35 pm

- Actuators
 - o We found one that will work
 - 4" stroke
 - Rated force 34 lbs
 - Requires 2 amps
 - 7" long
 - Has encoder
 - Unknown resolution
 - \$ 150
- Battery
 - o 3 lbs
 - o 20 Ah
 - o LiFe battery
- Will start buying stuff and start testing products to see how well they work
- Talk to other companies and make sure there isn't anything better
- Needle should fully actuate in 6 seconds
- If we have to sacrifice something to make a actuator work more weight is acceptable
 - o Do not sacrifice functionality
 - o Keep an eye on load vs unloaded speed
 - o Minimum stroke length 3"
- Chuck
 - o Look at Drimill tools
- Need to start manufacturing materials
 - o Needles
- Machine Shop Training Tuesday 11:30 am Tuesday
- Portfolio do more splitting up
 - o More individual tasks
- Have a prototype next week

Adjourned 4:38 pm

Meeting Review

- Addressed what we should start ordering and impressed the fact we need to split up tasks better in order to accomplish tasks quickly. It is great to do things together but to complete this project we will need to do more individual work.

Action Items

- Order Materials (Josh)
 - o Needle material
 - o Chuck
 - o Actuator
 - o Battery
- CAD drawing of case (Spencer)
- List of Materials on Trello
- Call companies about more information (Justin)

Meeting Minutes 10/19

Meeting held at Library 131 @ 3:35 pm

- Presentation of model/materials
 - o Chuck
 - Need a way to close the jaws
 - Need a way to screw into actuator
 - Need to drill a hole
 - o Load Cell
 - May need to switch to a pancake load cell
 - More expensive will equal better resolution
 - 1/10 lb minimum
 - 1/100 lb would be better
 - o Case CAD File
 - File is drawn up just need to purchase material
 - Decided to use wood to build the case
 - Need to see where components will set in the box
- Update on actuators/potentiometers
 - o L-511
 - Too big
 - Too Pricey
 - No word on resolution from potentiometers
- Update on Corn Stalks
 - o They are still drying and are looking good and can be picked up when ever
- Load Cell will have to be attached to the end of the actuator
- Battery will be in this upcoming week
- Will have to measure deflection of back plate and account for it in our calculations
- May need something to hold stalk before needle actuates
- Need a Motor Controller
- Should the Linear Encoder be separate?
 - o May not be as accurate or as efficient

Adjourned 4:21 pm

Meeting Review

- This was a great meeting because we finally had something physical to see. It wasn't a final product, but finally we are getting pieces and beginning to actually build.

Action Items

- Tap/drill actuator (Josh)
- Set up Motor Controller (Drew)
- Build Box (Spencer & Justin)
- Test Stalks (Team)
- Set up Electronics (Drew)
- Email Alias (Drew)
- Attend pitch workshop Monday (Team)
- Attend pitch business contest Friday (Team)

Meeting Minutes 10/26

Meeting held at Library 131 @ 3:35 pm

- Review of Action Items
 - o Started Machining Process (Josh)
 - Know threads/inch
 - Need to lock actuator in position
 - Battery is not here yet
 - Needle material is in
- We missed our shop training time
 - o Need to reset that time (Spencer)
 - Meet in Colton's office (GJ)
- Box is Built (Spencer & Justin)
- We now have a table in design sweet to keep our components
- Electronics are coming along (Drew)
 - o Raspberry Pi is set up
 - o Trying to get Arduino to talk to motor controller
 - o Working on understanding existing code
- Need to move corn stalks soon (Justin)
- Talked to PI and nothing smaller than the L-511 will meet all our requirements (Justin)
- Pitch Contest Friday @ 4:30 pm
 - o Pain Statement
 - Focus on loss of corn due to lodging
 - Billion metric tons per world wide
 - U.S. – 385 million metric tons - \$ 54 billion industry
 - o 5% loss of product - \$ 2.8 billion loss
 - o 25% loss of product - \$ 18 billion loss
 - o Who has Pain
 - Corn Growers
 - Cooking Industry (Corn Oil)
 - Sweeteners
 - Feed for Livestock
 - Ethanol
 - Starch users
 - o Solution
 - Make a device to help in selective breeding which will yield a more resilient crop
 - o Who is doing it?
 - No specific product uses our method
 - Agronomists are out there using other measuring devices (less accurate)

Adjourned 4:06 pm

Meeting Review

- It was great to see the case built so we could start assembly of the components into the box.
- This was also a great time to figure out how we were going to pitch our product in tomorrow's Pitch Contest.

Action Items

- Continue Action Items from Previous meeting

Meeting Minutes 11/2/17

Meeting held at IRIC 207 @ 3:30 pm

- Review of Action Items
 - o Electronics (Drew)
 - Actuator isn't moving yet
 - Connected to motor controller with Arduino
 - Very close to controlling motor from laptop
 - o Machining (Josh)
 - Plans are drawn out
 - Chuck Adapter
 - o Cut threads hopefully tomorrow
 - o Look into getting a different style of chuck
 - Needles
 - Load Cell attachment
 - o Will there be enough threads?
 - Yes there should be
 - o Purchase order needs approved for stud
 - Talked to Bill about machining a box
 - o Stalks (Justin)
 - Nothing new to report
 - o Wiki
 - Justin is taking over responsibility for the Wiki page
 - o Finally got a response from potentiometer company (Justin)
 - Accuracy should be around 1/100 "
 - o Need to find out how actuator and potentiometer are connected
- New information
 - o Looked into separate encoders
 - Concerns
 - May not fully detract
 - Spacing would be different
 - Can we collect data @ what hertz?
 - o May need to swap to a device without a actuator
 - Case is too unwieldy
 - Too big
 - o Research
 - Linear Encoders
 - How fast do they process
 - Spring Option
 - Something similar has been done
 - o With current prototype

- How will you start stop test?
 - Strap to hold weight would be impractical
 - Need to cut the length by about a third
- Pitch Event
 - Went well
 - We didn't win
 - However we did gain a new perspective
 - People want to make money – Engineers want to solve a problem
 - In the pitch the judges didn't really care about the problem, they just wanted to hear our business plan

Adjourned 4:37 pm

Meeting Review

- This was a great meeting to touch base on how our project is going and give a chance to really unpack how they pitch event went and maybe use some of the concepts we learned from it in designing our product from now on.

Action Items

- Redesign Box
- Get actuator Working (Drew)
- Load Cell & needle attachments working (Josh)
- Find a linear Encoder (Justin)
- Find new Chuck (Josh)
- See how long Battery Lasts (Drew)

Meeting Minutes 11/6/17

Meeting held at Library 131 @ 2:30 pm

Josh was unable to attend as he was machining the needle at this time.

- Review of Action Items
 - o Found a possible Linear Encoder (Justin)
 - o Actuator is running
 - Getting position feedback into script
 - Will test battery life this week
 - Need to get a charger for the battery
- Portfolio
 - o Get all minutes and agendas updated & uploaded (Justin)
 - o Update information (Drew)
 - Specs
 - Constraints
 - o System Design Diagram
 - o Budget/expenditures
 - Josh needs to keep track of amount
 - o Analysis of alternatives (Justin)
 - With encoder is there a delay
 - o See if we can turn in Portfolio Thursday (Spencer)
 - o

Adjourned 3:05 pm

Meeting Review

- This was a quick meeting and was good for making sure we had everything there and updated for the portfolio.
- It was also a real quick progress report on what we have found out in the last four days.

Action Items

- Assembly Portfolio (Team)
- Log Books (Individuals)
- Email Dr. Robertson about turning things in Thursday (Spencer)
- Talk to Josh about Bill of Materials (Drew)

Meeting Minutes 11/9/17

Meeting held at Library 131 @ 3:35 pm

Status Report

- Actuator
 - o Calculated the resolution of actuation using the Arduino - 1/10 what we want
 - That could be because of the Arduino and not the potentiometer
 - Look at getting a new 12 bit ADC
 - o Actuator is running with potentiometer
- Battery Charger is coming
- Why 2 load cells in previous devices?
 - o Cross dimensional loading (Large Deflections)
- Need to build a stalk holding device
 - o Soft edges
 - o Fixed beam or rotational bar design

Adjourned 4:17 pm

Meeting Review

- Overall this was a good meeting and helped establish where we are with the project.
- This is also when we turned in our Logbooks and Portfolio for review

Action Items

- Design Stalk Holder
- Order ADC

Meeting Minutes 11/13/17

Meeting held at Library 133 @ 2:30 pm

Design Report

- Have as much of the physical prototype ready by Friday
- Specifications, Constraints, & Deliverables
 - o Spencer
- Project Learning
 - o Background
 - Research on Corn & Stock Lodging
 - Justin
 - o Components
 - Actuator
 - Josh
 - Load Cells
 - Josh
 - Linear Encoders
 - Josh
 - Raspberry Pi / Electronics
 - Drew
 - o Principle of how it works
 - Spencer
- Presentation of 3 viable designs with pro/cons
 - o Actuator with Potentiometer
 - Drew
 - o Had Powered with Encoder
 - Justin/Spencer
 - o Cam Spring loaded with Encoder
 - Josh
- Budget
 - o Josh
- Project Schedule
 - o Drew
- Potential Risks & Problems
 - o TBD Wednesday

Adjourned 3:17 pm

Meeting Review

- This was a quick meeting to sort out what needs done for the Action Presentation we have Friday.

- This was also a great time for us as a team to evaluate where with regards to our plan and try to get back on schedule before break.

Action Items

- Bring assigned materials to the Wednesday Meeting

Meeting Minutes 11/15/17

Meeting held at Library 132 @ 2:40 pm

Progress Report

- Found a way to make a variable motor work
- Found more information on Potentiometer
 - Price \$84-\$100
 - Stopper Strength

Electronics

- Actuator is working
- Have a plan for the Raspberry Pi

Presentation of Hand-held device design

- Not all slides are done, but we are close
- Possible 3rd idea (our cam idea will not work)
 - Gas Spring – Need to gather for information
 - 1-way Dampener
 - Force Constant Spring
- Keep looking into encoders
 - Is there delay for data readout?
- Need to explore safety

Adjourned 3:20 pm

Meeting Review

- This was a quick update meeting to sort out where we are and what preparations still needs done for the Action Presentation we have Friday.
- This meeting was our final preparation day so that we can practice for our presentation

Action Items

- Slides for the Design Review must be done tonight

Meeting Minutes 11/16/17

Meeting held at Library 132 @ 3:30 pm

Progress Report

- Threads for adapter from needle to load cell are off
 - Still need to get design drawing on presentation
 - Citizen Reviews due tomorrow

Presentation

- Have a costs associated with each design added to the slides about pros and cons for each design
- IRIC 305 be there at 8:30 am on Friday

Meeting Review

- This was our last practice before our design review and allowed us to practice our slides and what we were going to say
- We will be meeting in the morning for our design review and I believe that we are prepared for it

Action Items

- Present our Design Review Presentation in the Morning

Meeting Minutes 11/29/17

Meeting held at Library 132 @ 2:25 pm

Snapshot Day

Course Deliverables

- Log Book
- Portfolio
- Stuff on Mindworks
 - Budget
 - Schedule
 - Project write up

Snapshot Day

- Design Review Slides
- Addition of Feedback
- Bring Prototype
- Meet tomorrow get feedback from Dr. Robertson
- Review of Interview with corn geneticist

Snapshot

- Designs
- Budget - Josh
- Problem Statement
- Brief Background - Justin
- Components - Drew
- Concept - Spencer
- Specs/constraints - Spencer
- Feedback
- Timeline
- Assemble before

Next Meeting

- Meeting tomorrow Dr. Robertson
 - Go over design review feedback with Dr. Robertson

Adjourned 2:57

Action Items

- Assemble Snapshot Day stuff/board

Meeting Review

- This was our first meeting back from break and was more of a call to action to finish up as much as we can with the 3 weeks of school we have left.
- This was also our meeting to prep for Snapshot Day and make sure we have all the material ready or divided up

Meeting Minutes 11/30/17

Meeting held at Library 132 @ 3:33 pm

Instructor Time

- Next meeting – no meeting during finals
- Snapshot Day
 - Bring Prototype
 - Make gas Spring Prototype
 - Research into remote control gas spring
 - Just use motor no gas spring?
- Need to do more prototypes
 - Requirements/size will change
 - More independent prototype
- Next Design Review
 - Less slides
 - Less Words
 - More of a Discussion

Interview with Corn Geneticist review

- Lodging can be caused by root lodging
- This device can focus on specific phenotype
- The device can focus on specific phenotype which correlates with a specific part of the genome

Next Step

- After break
 - More prototypes
 - Mount Actuator
 - Start Testing existing prototype
 - Gather Data
- Snap Shot Slides
 - Place comments on whether slides should be printed 1 or 2 slides per page
- Portfolio due next week 12/8
 - Add project learning for each person
 - What have we learned?
 - What didn't work?
 - Why?
 - Update Minutes
 - Design Goals
 - Specs/Constraints
 - Analysis of Alternatives

- Pros/Cons
- Add Manufacturing Plan
- Update Budget
- Add System Diagrams
- Add cover Sheet

Adjourned 2:57

Action Items

- Assemble Portfolio

Meeting Review

- This was our first meeting back with Dr. Robertson from break and helped clear up any questions we have and focus on what must be done before the end of the semester.
- This was also our final preparation day for Snapshot

Meeting Minutes 12/7/17

Meeting held at Library 132 @ 3:30 pm

Instructor Time

- Review of Semester
 - Everything in by Monday

Next Step

- Mount Actuator
- Shrink Case
- Start Testing

Design Process

- Start with nothing – end product will be a product
- Must work on evolving product
- Need to keep moving forward

We have stagnated

- Must keep building
- We need new prototypes –doesn't have to be perfect
- How should we balance spending with building?
 - If buying will speed things up then buy it
 - Just don't go wild

Faculty will be around intermittently over break

Responsibilities

- Need deadlines for action items
 - Assign someone to follow through?
 - Not at this point

Next Meeting

- Wednesday 1:45 -2 pm
 - Follow up on action items

Adjourned 4:10

Action Items

- Minute up on Trello – Endo of the Day

- Wiki page – Done by tomorrow
- Portfolio – up by Sunday
- Hand Powered prototype – end of break – Justin
- Redo current prototype/add actuator mounting – End of Break – Spencer
- Electronics finished and battery run time – end of break – Drew
- Sliding Case Prototype – End of Break – Josh
- Corn Stalks stored at JML – Next Meeting – Justin

Meeting Review

- This was a meeting focused on making sure that our team was focused on getting our tasks done and on track to finish our project.

Meeting Minutes 12/13/17

Meeting held at Library 132 @ 1:45 pm

- Review of Portfolio
 - Bill of Materials
 - Add supplies and prices
 - Add technical sheets
 - Electronics
- Webpage
 - Fix error in design tasks
 - Task #4
- Collect all work for electronic filing
- Project Learning
 - Review of the semester
 - Break designs down into different systems

Next Step

- Target Specifications
- Develop Experimental Plan
- Get Feedback on Documentation
- Review of Deadlines and Action Items

Next Steps

- Over break we need prototypes built
- Must work on evolving product
- Need to keep moving forward

Responsibilities

- Need deadlines for action items

Adjourned 2:15

Action Items

- Hand Powered prototype – end of break – Justin
- Redo current prototype/add actuator mounting – End of Break – Spencer
- Electronics finished and battery run time – end of break – Drew
- Sliding Case Prototype – End of Break – Josh
- Corn Stalks stored at JML – Next Meeting – Justin

Meeting Review

- We are slightly behind but not terribly so, if we can keep moving forward we should be able to get more or less back on track