

## **NEW AND REVISED METHOD OF TAKING NOTES**

1. Open the outline by clicking “Help” (next to Add-ons) and type in “outline”. Click on first link to open it.
2. To make a new entry, no need to scroll 50 billion pages. Click the bottom most link in the outline and scroll down a bit. Press ctrl+enter (**DO NOT PRESS ENTER MULTIPLE TIME!!!! YOU’LL RUIN IT THAT WAY!!!!**) and paste/edit notes.
3. **MAKE YOUR TITLE A “TITLE” HEADING!!!** (Left of where you can change the font to things like “Times New Romans” or “Georgia”) and delete the rest of the things in the outline that don’t follow the naming format “Engineering Notes (Date)”

## Engineering Notes (12/2/17)

**Session:** 1

**Location:** Anish's Garage

**Attendance:** Arjun, Albert, David, Rithik, Jason, Anish, Yiming, Alex, Aryan, Aaron, Jamie, Jingwen, Parva, Krish, Euan, Jaimin

**Coaches:** Srini, Raj

**Note Taker(s):** David Kurniawan

<b>Objectives</b>	<b>Achievements</b>	<b>Issues and Concerns</b>
Teach build & design subgroups how to disassemble and assemble a gearbox, practice build with a table, & teach people who are interested in pneumatics	The team was able to learn a lot of basic concepts and tool use in addition to hands-on experience	
Teach electronics and programming people how to work basic electronics and what the purpose of various electronic parts are	We were able to get some basics knowledge spread among our team members	
Set basic framework for fundraising and set goals for fundraising	Began planning on what companies to target and set a total target amount(100k) with a closing rate of 20% (20k)	None

## Objectives & Work Done

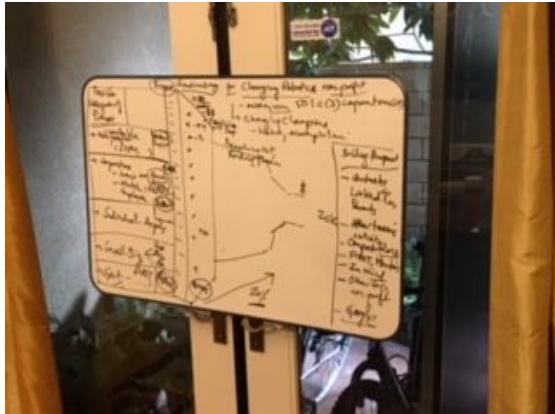
### Problems *What problems did we face and how did we solve or attempt to solve these?*

-Gearbox

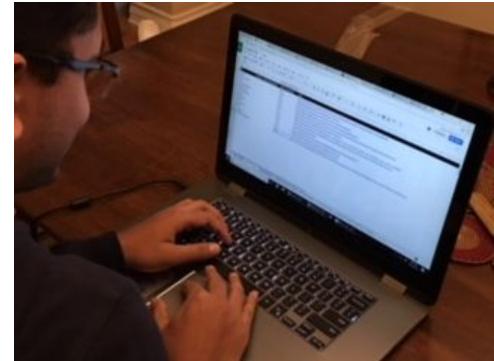
- The build team were unable to locate all the parts needed to complete the gearbox
- Couldn't work around small difficulties in the diagrams
- Worked without a plan and a goal in mind

Solution: Talk about problems instead of trying to solve them individually, ask mentors for help, and

## Pictures



Fundraising team drawing up plan and basic framework/approach for season



Fundraising team drafting a list of companies to target in order to complete 100k goal



Build & Design Team constructing a work table as practice experience working with various build parts



Build and Design members learning the working of pneumatic system



Build & Design Team trying to reconstruct gearbox for drive system off a schematic

## **Engineering Notes (12/3/17) 2:00PM-4:00PM**

**Session:** 2

**Location:** Anish's Garage

**Attendance:** Arjun, Albert, David, Rithik, Jason, Anish, Yiming, Aryan, Aaron, Jamie, Jingwen, Parva, Krish, Euan, Jaimin, Jun, Steven

**Coaches:** Srinivas, Raj

**Note Taker(s):** Jason, Rithik

<b><u>Objectives</u></b>	<b><u>Achievements</u></b>	<b><u>Issues and Concerns</u></b>
Continue the list of prospective companies that we want to ask for funds from	We were able to double our list of companies and wrote down the information needed	We need to find more specifics on the amount of money that they can give
Go over the concept of how gears work and how to assemble a gearbox	We were able to go through the skeletal structure of the gearbox and understand how gears work, as well as partially assembling a gearbox. We also tackled the electrical aspects of the robot by knowing how to stripe a wire and attach anderson powerpole onto it.	There were a lot of missing parts, as well as broken gears.
Build Team #2 plan out the shooter design	Conceptual design of the shooter, got parts together, and started assembling into cad	Material to use, size, and parts

### **Objectives & Work Done**

- **Fundraising Team:**
  - We started off with introducing Jun to the fundraising team as today was his first day, so we wanted to get him familiar with our strategy and plan
  - We went over the types of sponsorships we were going to have each member work on
  - Each member worked on finding different companies in their sector, and we all built upon our preexisting list
- **Build Team:**
  - We started off by discussing what wheels we will want to work with to get the sense of idea of what our gearbox will be
  - We split into 2 groups, one focusing on designing the shooter mechanism, and the other focusing on the gearbox.
  - The group that focused on gearbox was able to understand the concept of how gears work in relation to a versaplanetary gearbox. With the ample time left over, we were able to assemble a partial gearbox
  - Even after completing a gearbox, the group moved to the electrical aspect, where we learned to stripe wires and attach anderson powerpoles

- Designed a simple retrieval system

## **Problems** *What problems did we face and how did we solve or attempt to solve these?*

- **Fundraising Team:**
  - We couldn't find too many of the specifics of amounts donated to teams, so we tried looking for the previous teams who were sponsored by these companies and tried to estimate the amounts we could get
- **Build Team:**
  - Most of the problems fell under that category of missing parts. Since we had not restock on our resources, we were unable to fully assemble a working gearbox

## **Research** *What did we have to learn about in order to move forward?*

- **Fundraising Team:**
  - We had to delve into deeper research on the companies we were attempting to gain funding from
  - Also, we took a look into government grants which while they were slightly confusing, they provided a lot of opportunities for funding
- **Build Team:**
  - We had to learn the basics of gears and understand why it is necessary to have a gearbox
  - We had to learn how to assemble a gearbox, so we read over the manuel and got ourselves comfortable with the parts that the gearbox needed
  - We also had to learn the names of each tools and what they do. In this case, we learned how to use a wire striper and a crimper to attach anderson power poles onto the wires.

## **Decisions Made** *What progress did we make? What was achieved?*

- **Fundraising Team:**
  - We decided that today was the day that we hopefully were going to finalize our list of companies
- **Build Team:**
  - We decided that today would be the day where the gearbox team would be able to have the basic knowledge of how the gearbox would work.

## **What we learned** *What mistakes did we make and what can we learn from them?*

- **Build Team:**
  - Some of the mistakes we made was having a plan to start off with and how to divide the work.

## Pictures



*Fundraising team discussing aspects of Government Grants*



*Build Team discussing the goals and mission we wish to accomplish*



*Gearbox team going over the material and attempting to assemble a gearbox*

## **Engineering Notes (12/8/17)**

**Session:** 3

**Location:** Anish's garage

**Attendance:** Arjun, Parva, Aryan Jason, Steven, Jamie, Jun

**Coaches:** Srinivas, Raj

**Note Taker(s):** Parva Shah, Jun, Steven

<b>Objectives</b>	<b>Achievements</b>	<b>Issues and Concerns</b>
To sort and take inventory of all parts and tools, including new recently delivered parts	All parts sorted, including new deliveries, inventory partially complete	Many old parts and part with an unknown purpose found
Continue researching while also sending out inquiries to companies		Our list may be a little small

### **Objectives & Work Done**

- **Fundraising Team:**
  - We had
- **Build Team:**
  - We began by organizing each part by their general categories
  - Then we moved every part which belonged in each category to labeled boxes or shelves in order to keep everything related in one area

### **Problems** *What problems did we face and how did we solve or attempt to solve these?*

- **Build Team:**
  - many parts, especially screws and rivets, were mixed up, so they were reorganized into boxes

### **Research** *What did we have to learn about in order to move forward?*

### **Decisions Made** *What progress did we make? What was achieved?*

-All parts and materials sorted

-Inventory partially completed

### **What we learned** *What mistakes did we make and what can we learn from them?*

## Pictures after Sorting:



## Engineering Notes (12/9/17)

**Session:** 4

**Location:** Anish's Garage

**Attendance:** Aaron, Arjun, David, Euan, Ganesh, Jaimin, Jamie, Jason, Jun, Parva, Rithik, Rudy, Sophie, Steven, Yiming

**Coaches:** Raj, Srinivas

**Note Taker(s):** Ganesh, Albert, Anish

<u>Objectives</u>	<u>Achievements</u>	<u>Issues and Concerns</u>
CAD - get subteam started on practicing basic chassis modeling	Software and CAD files for basic structure downloaded	
Build - develop skills in basic topics for mechanics, such as gearboxes and pneumatics	Old members completed planned lessons	
Fundraising - continued effort		

### Objectives & Work Done

Electronics circuit board wired

Parts stripped from previous season's robot for reuse

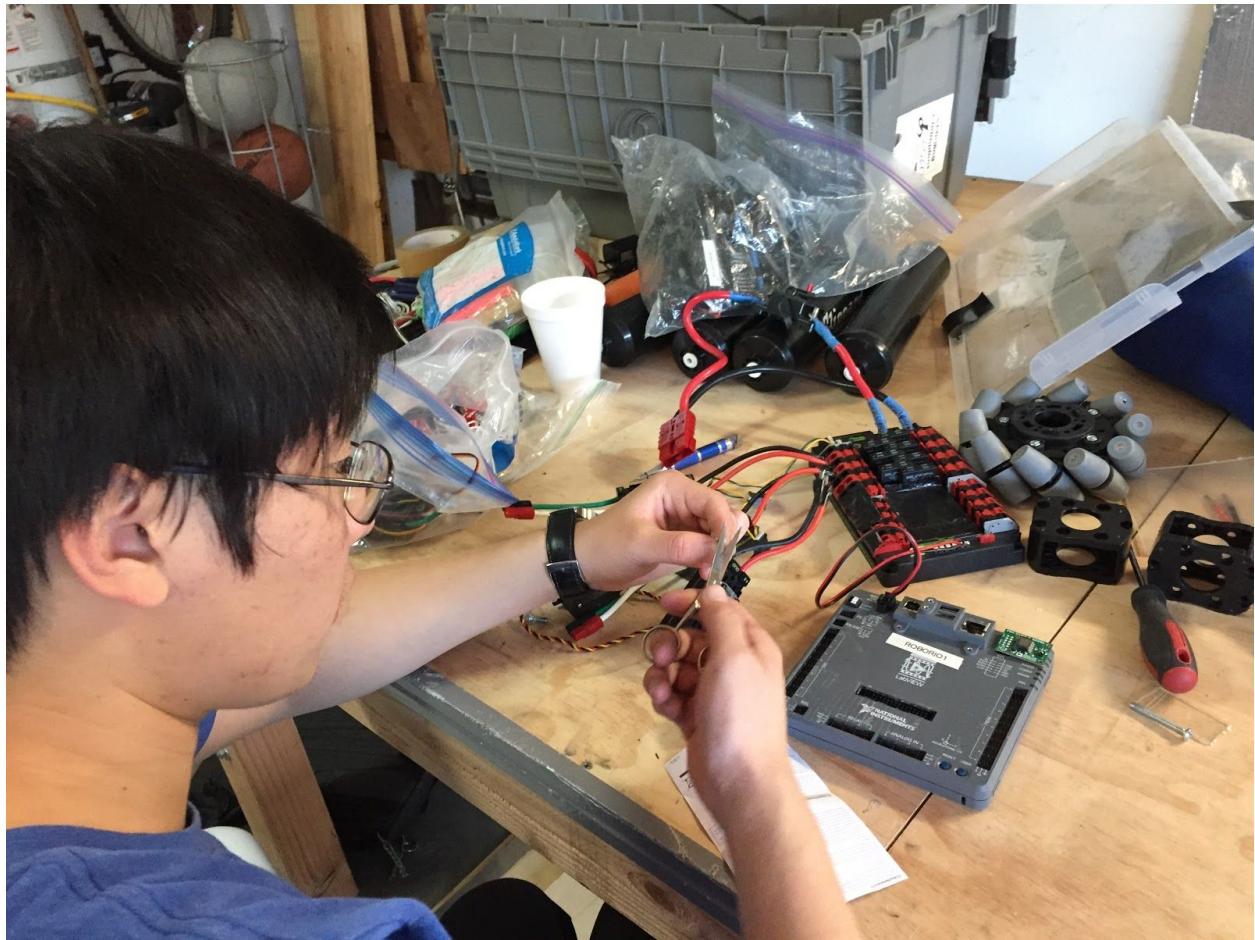
**Problems** *What problems did we face and how did we solve or attempt to solve these?*

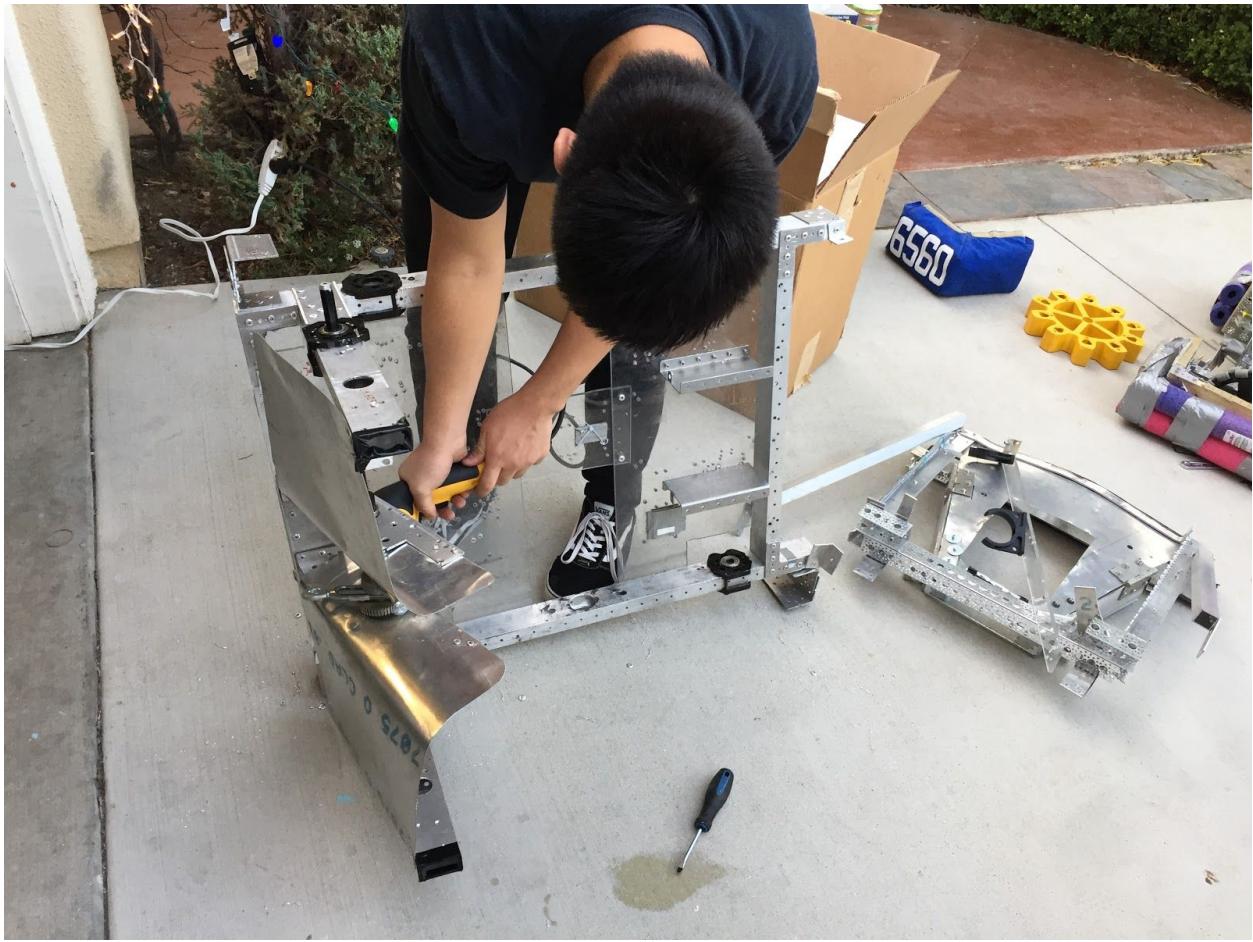
**Research** *What did we have to learn about in order to move forward?*

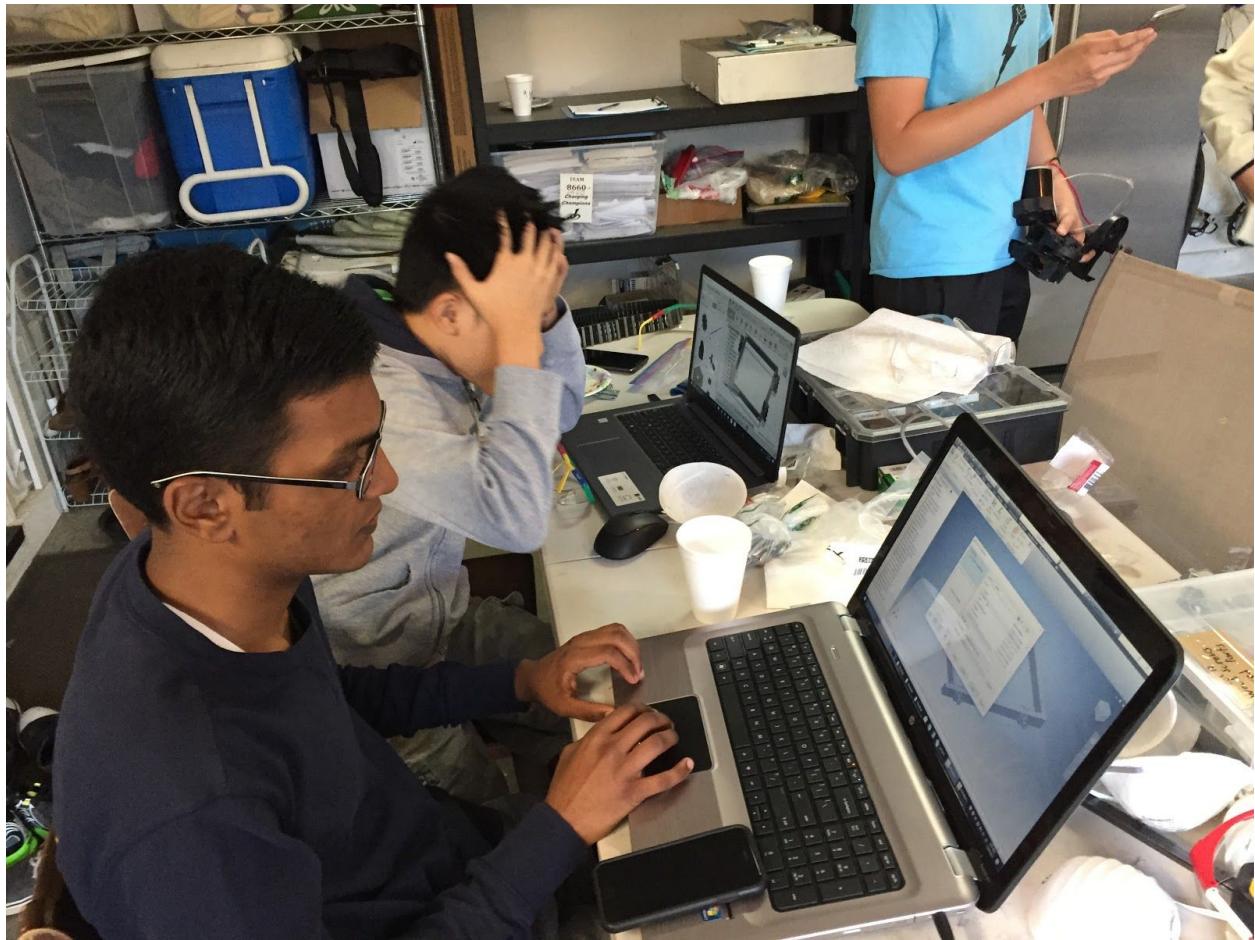
**Decisions Made** *What progress did we make? What was achieved?*

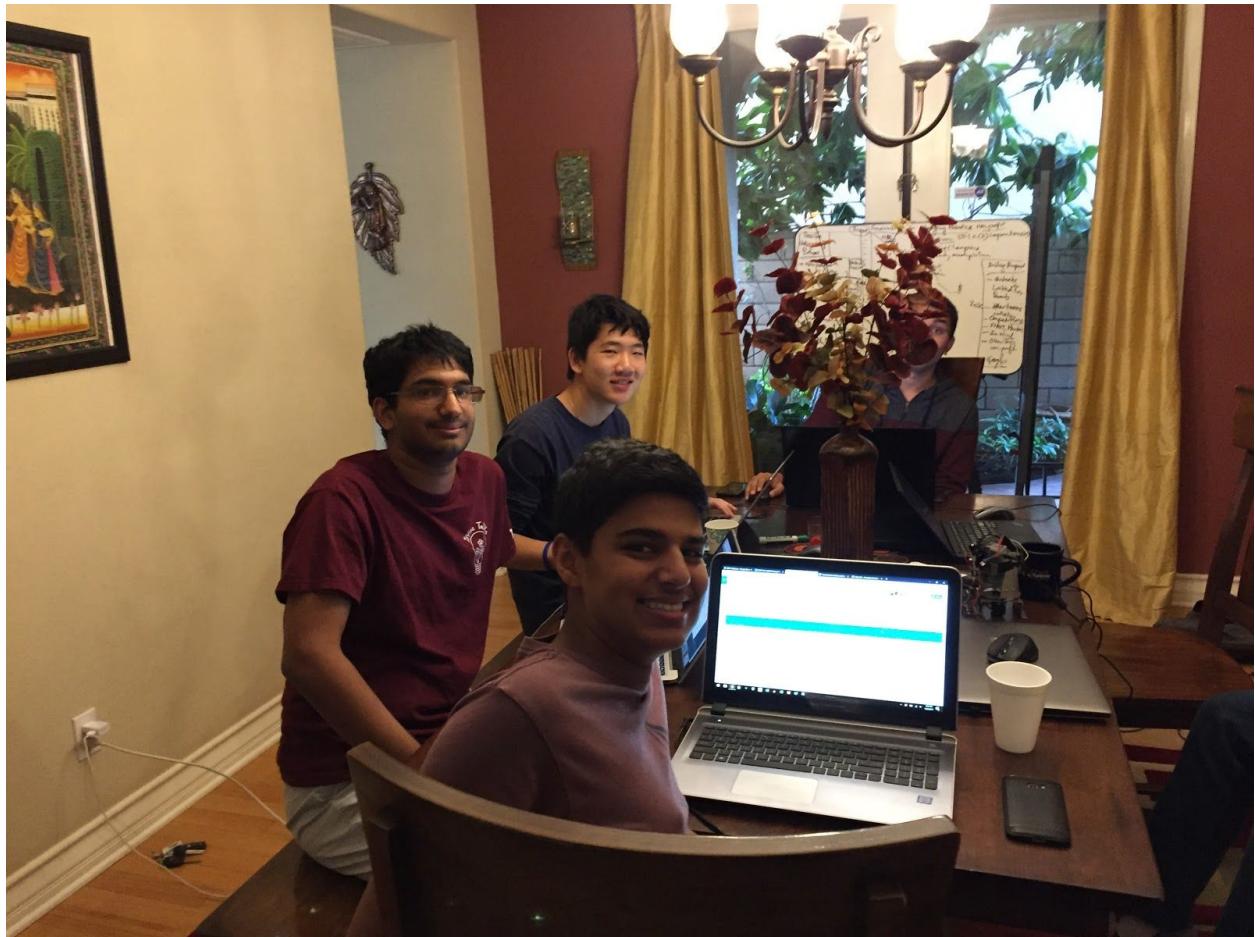
**What we learned** *What mistakes did we make and what can we learn from them?*

### Pictures









### **Engineering Notes (12/10/17) 1:30PM-5:30PM**

**Session:** 5

**Location:** 116 Capeberry

**Attendance:**

**Coaches:**

**Note Taker(s):** Jaimin Patel, Krish Mehta, Jingwen Hu

<b><u>Objectives</u></b>	<b><u>Achievements</u></b>	<b><u>Issues and Concerns</u></b>
Finish corporate and non-profit grant applications	We finished both of our objectives	Our disorganized prospect list was a minor hindrance, but we overcame it by dedicating time to fixing it.

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## **Objectives & Work Done**

- **Fundraising Team:**
  - From the prospect list spreadsheet, we were able to contact all of the available non-profit and corporate grant prospects. We also sold the 3D Printer on Ebay for \$180. We additionally reorganized the spreadsheet and introduced a color coding system.
- **Build Team:**
  -

## **Problems** *What problems did we face and how did we solve or attempt to solve these?*

- **Fundraising Team:**
  - Our prospect spreadsheet was disorganized, so we organized our progress by colors and grouped companies into different categories based on their availability and process. Our columns were reorganized and we introduced new cells to reflect new and relevant information.
- **Build Team:**
  - d

## **Research** *What did we have to learn about in order to move forward?*

- **Fundraising Team:**
  - We have to further grasp how to do Corporate Matching, and we have to draft emails for local businesses.
- **Build Team:**
  - d

## **Decisions Made** *What progress did we make? What was achieved?*

- **Fundraising Team:**
  - d
- **Build Team:**
  - d

## **What we learned** *What mistakes did we make and what can we learn from them?*

- **Build Team:**
  - d

## **Pictures**

## Engineering Notes (12/15/17)

Session: 6

Location: Rithik Garage

Attendance: Albert, Rudraksha, Yiming, Jingwen, Euan, David, Aaron, Ganesh, Arjun,

Coaches: Srinivas, Raj

Note Taker(s): Rudraksha, Yiming, Euan

<b>Objectives</b>	<b>Achievements</b>	<b>Issues and Concerns</b>
Build: Work on Intake System and Drivetrain	<ul style="list-style-type: none"><li>Plexiglass breadboard removed</li><li>Drilled holes for motor</li><li>Attached Colson Performance wheels</li></ul>	<ul style="list-style-type: none"><li>Wheel hub not secure for now</li><li>Hard to drill holes</li></ul>
Finish CAD Chassis diagrams	Got previous chassis and started putting new parts	Hard to implement. Computer slow to respond so takes even longer
Move workspace to Anish's and Arjun's garage	We did it	Manpower low

### **Objectives & Work Done**

- Remove plexiglass breadboard by removing its rivets → Complete
- Drill holes for motor axles (hex shaft) to be put through → Complete
- Attach Colson Performance Wheels to ball Intake System → Complete
- CAD Chassis → Kind of Complete

### **Problems** *What problems did we face and how did we solve or attempt to solve these?*

- Due to the size of the chassis hard to drill holes into the frame
  - Solved by placing the chassis off the side of a table and drilling from there
- Wheel hub not secure for now
- CAD has a hard time implementing. Computer too slow to implement changes that build wants. Might want to propose working at home and build contacting through slack (my computer at home is faster)

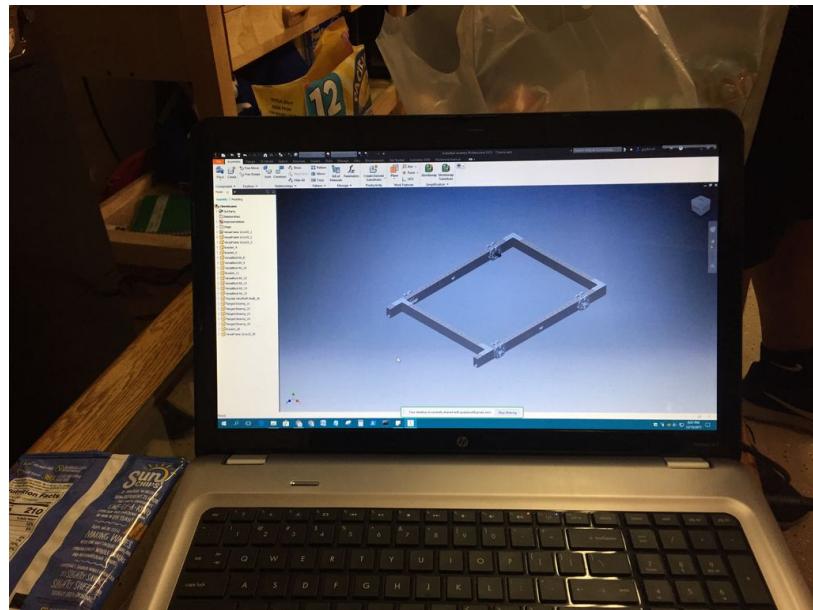
### **Decisions Made** *What progress did we make? What was achieved?*

- Continued to build chassis, but constrained CAD because again computer slow.

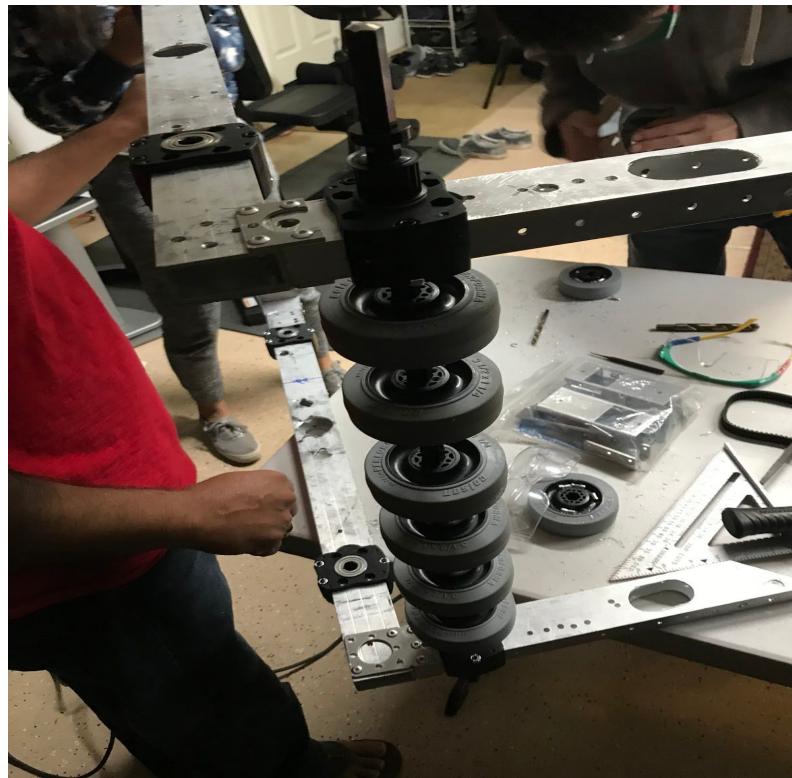
### **What we learned** *What mistakes did we make and what can we learn from them?*

- Mistakes for CAD: get a faster computer to make changes to show build.

### Pictures



CAD



*Dissecting our last year's shooting mechanism*

## Engineering Notes 12/16/17

Session: 7

Location: Rithik's garage

Attendance: Albert, Euan, Yiming, David, Aaron, Jingwen, Jamie, Sophie, Parva, Alex, Jaimin, Jun, Rithik, Aryan

Coaches: Srinivasan

Note Taker(s): Aaron, Sophie, Alex

<b>Objectives</b>	<b>Achievements</b>	<b>Issues and Concerns</b>
Finish the mecanum wheel drive	Attached motor, pulley and gear system to allow for mecanum wheel to drive.	Waiting for 70 tooth gear to arrive
Start intake system build for the shooter (balls) (wiffle)	Metal cut for plexiglass top and intake system. Basic intake system designed.	No issues. Will be continued with actually attaching plexiglass and more complex design of the intake system.
Send fundraising applications to local business to acquiesce some dough		
Build a new sign in sheet electronically	Wrote code with google sheets API	Exporting to Raspberry Pi and understanding the API
Finish programming drive subsystem	Done with drive system and began to program the intake system	Couldn't test if mecanum drive was working properly because missing a gear
Do small businesses and continue with corporate grants	Applied to small businesses - food and clothing	No issues. Plan to continue with clothing and start monetary requests from businesses tomorrow

### Objectives & Work Done

- **Fundraising:**
  - Applied to more corporations for grant
    - Listed and color-coded them in the Prospect List spreadsheet
  - Applied to small businesses
- **Build:**
  - Attach motor, mecanum wheel
  - Design intake system
  - Mount motor
    - Cut metal for intake motor
  - Cut support metal for plexiglass top
- **Programming/Electronics**
  - Wired PDP, RoboRIO, motor controllers and motors together
  - Finished programming drive subsystem and intake subsystem

## **Problems** *What problems did we face and how did we solve or attempt to solve these?*

- A gear is missing for one wheel, so the programming could not be tested.
  - Waiting for gear to arrive
- Motors were loosely connected.
  - Solved by switching the screw. The screw that was initially used was wrong material.

## **Decisions Made** *What progress did we make? What was achieved?*

- All wheels and motors were attached along with the programming implemented.

## **What we learned** *What mistakes did we make and what can we learn from them?*

- Check all material for accuracy before building.

## **Pictures**



*Build team setting up drivetrain*



*Fundraising team working on sponsorship requests*

## **Engineering Notes (12/17/17)**

Session: 8

Location: Rithik's Garage

Attendance: Arjun, Yiming, Albert, David, Rithik, Aaron, Euan, Krish, Jingwen, Jamie, Sophie, Jun

Coaches: Srinivas, Raj

Note Taker(s): Aaron, Jamie, Aryan

<b><u>Objectives</u></b>	<b><u>Achievements</u></b>	<b><u>Issues and Concerns</u></b>
Put on plexiglass base, attach electronics	Riveted L brackets and bar supports, drilled and riveted the plexiglass onto the bars, ductaped electronics onto plexiglass	Plexiglass very flimsy at areas without a support, almost broke entire plexiglass. Drill shattered.
Make business email address through Gmail and check with Google to see if we can get a free @chargingrobotics.com address.		
Follow up with all small businesses, corporates, and non-profits, even if we receive a "rejection letter"		
Design a shooting system	Shooting system created, parts compiled, unriveted old supports to use, begun construction of shooting system	Tread and movable shooting system may be incompatible, sheet metal may be too flimsy, drill bits flat, hard to unrivet

### **Objectives & Work Done**

- Create a plexiglass base to store electronics-done
- Create and build a shooting system-in process

### **Problems** *What problems did we face and how did we solve or attempt to solve these?*

We had to redo the mecanum wheel drive placements as our wheels were inverted, took lots of time.

We had to find a way to create a round surface without cutting as we lacked the materials to cut a new surface, done by bending sheet metal.

We had to conserve resources through the support of motors, done by reusing old parts and unriveting, drill bits weak so drill bits replaced.

### **Research** *What did we have to learn about in order to move forward?*

How to create a proper shooting mechanism and bring balls over, achieved by looking at past videos for inspiration on shooting mechanisms

### **Decisions Made** *What progress did we make? What was achieved?*

We chose to use sheet metal for the surface, we chose use a sturdy wheel for rotating and shooting balls, we chose to only use one propelling surface for the balls rather than two to keep the shooting mechanism simple and easy to control.

### **What we learned** *What mistakes did we make and what can we learn from them?*

Do not use long rivets, those take too long to rivet and too much strength for us.

### **Pictures**

## **Engineering Notes (12/22/17)**

Session: 9

Location: Anish and Arjun's Garage

Attendance: David, Albert, Arjun, Anish, Alex, Ganesh, Parva, Krish, Euan, Aaron, Yiming, Jaimin

Coaches: Coach Raj

Note Taker(s): David, Anish, Steven

<b><u>Objectives</u></b>	<b><u>Achievements</u></b>	<b><u>Issues and Concerns</u></b>
Design frame and mechanism for shooter	Able to settle on a frame and completed the necessary parts, with only objective left being assembly of the pieces	
Assemble electronics and attach to the robot, and create a compartment/carriage for battery	Able to tape electronics down, although battery carriage not yet completed	
Mapping out buttons for mecanum wheel drive	Program finished and debugged, the controller worked fine	
Finish and test attendance system	Able to get the attendance system working	Slight bugs with the code
Test the drive system for the robot	Robot achieved fully functional movement	
Expand small businesses prospect list to 500 companies and reach out to local car dealerships	List is now at 75 companies, and received positive responses from a few companies - will follow through over the next few days and hopefully secure funding	
Create plan for outreach during season		

## **Objectives & Work Done**

### **Problems** *What problems did we face and how did we solve or attempt to solve these?*

- Build Team
  - Couldn't find the specific screw needed to complete motor, did some research on specific screw specifications
  - How to bend metal sheet into shape needed for shooter frame, we created a cast out of wooden block cut into the shape needed

- Time concerns led to the removal of shooter rotation and adjustability
- Programming
  - Attendance system ran into a few bugs, looked at a template code to find what was missing
- Fundraising
  - Expand prospects list to 500 businesses (eventually this large) - for now there are 75 businesses
  - Reached out to car dealerships and received some positive responses

### **Research** *What did we have to learn about in order to move forward?*

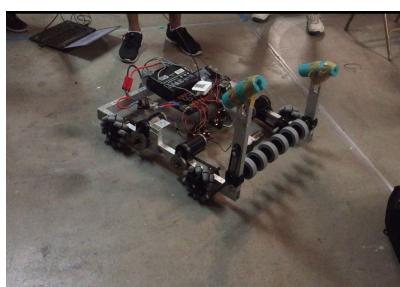
- Build Team
  - Had to go online to find the specification for screws in order to complete motor

### **Decisions Made** *What progress did we make? What was achieved?*

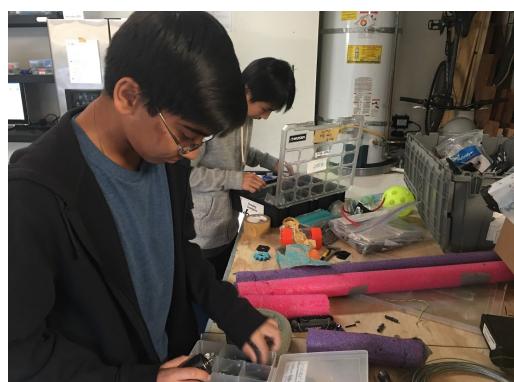
- Tested the drive system with electronics attached to the plate in their intended positions
- Decided to go for a more simple shooter design

### **What we learned** *What mistakes did we make and what can we learn from them?*

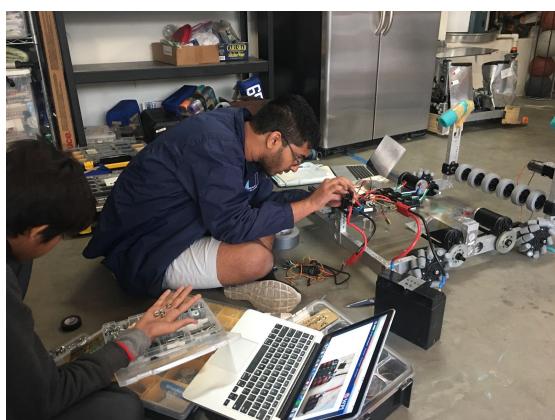
#### **Pictures**



Testing mecanum wheel drive with electronics attached



Assembling motor for



Connecting electronics and attaching them onto plexiglass plate

Designing the frame and mechanism to shoot the balls





Test run of new attendance system  
&  
Programming the buttons to control mecanum wheel  
drive

## **Engineering Notes (12/23/17)**

Session: 10

Location: Arjun and Anish Neervannan's Garage

Attendance: Jun, Anish, Ganesh, Albert, Euan, David, Arjun, Yiming, Jason, Aaron, Krish, Parva, Jamie, Sophie

Coaches: Coach Raj, Coach Srinivas, Coach Raja

Note Taker(s): Jun, Euan, Arjun

<b>Objectives</b>	<b>Achievements</b>	<b>Issues and Concerns</b>
Get the shooter working independently of the robot	The wheel is attached to the setup with a curved ramp.	Attaching the motor may be a problem Motor smokes up a little and smells burnt when activated too quickly Ramp still possibly needs more work for stabilization
Work on the intake system and get it to deposit balls into the storage	We have the dimensions for the ramp that will feed into the storage	
Get the electronics set up	Electronics are taped down and the wireless is working	
Renovate the garage with various improvements such as a carpet, better outlets, and general organization	The carpet has been placed and more outlets have been added. The organization is also better.	

### **Objectives & Work Done**

- We have the shooter set up with wood and a curved metal ramp. The motor is not attached but we have attached the wheel and tested it out
- We also have the ramp dimensions drawn out on a sheet of metal. We just have to cut it and rivet it on to the robot.
- Electronics have been taped down to the robot and the wireless connection is working. We do, however, have to find a proper placement for the motor.

### **Problems** *What problems did we face and how did we solve or attempt to solve these?*

- Build Team
  - Attaching the motor could bring up some problems because the holes on the vexpro gearbox are a bit hard to align. Also, we may not have enough space.
  - The ball may not be shooting at the correct angle, so we will have to fix that

- The storage container will not be completely optimized as this is just a Proof-of-Concept
  - There was frequently too many people doing the same task, resulting in some people not being able to participate efficiently. All we did was spread ourselves out a bit more
  - The intake wheels had loose parts that jangled with the shaft when spun. We either fastened the parts or removed the extra parts.
- Programming
  - Alex wasn't here so the programmers were stuck on what to do next
- Fundraising
  - We ran into some difficulties finding easy ways to contact local businesses.
  - We will turn to cold phone-calling and online forms to spread our GoFundMe link
  - GoFundMe link must be updated to attract donations/spread publicity
  - Possible look in DataMining to increase efficiency in contacting/organizing local businesses

### **Research** *What did we have to learn about in order to move forward?*

- We researched different ways the ball could be actively fed into the shooter such as a rotating plate with 4 stick-like structures evenly distributed sticking out.

### **Decisions Made** *What progress did we make? What was achieved?*

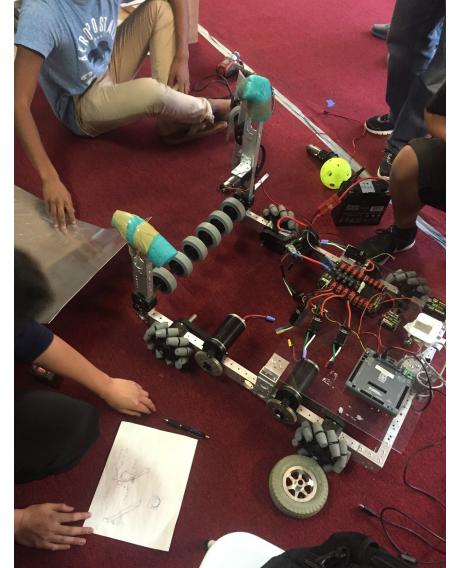
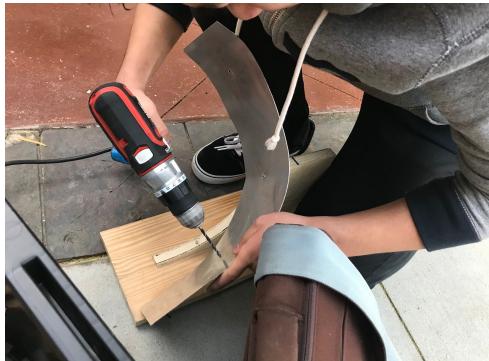
- *Tested the drive system with electronics attached to the plate in their intended positions*
- *Decided to go for a more simple shooter design*

### **What we learned** *What mistakes did we make and what can we learn from them?*

- *We used the wrong screw for the shooter motor so we spent a long time figuring out which holes the screw was supposed to fit in. We can learn that if something doesn't work, don't force it to work.*
- *The intake system had loose parts that jangled with the shaft when spun. We learned that we need to revise even our oldest finished parts to see if there are any mistakes that we failed to see earlier.*

## Pictures

From top left, clockwise: drilling the holes for the curved ramp to attach to the wood. The independent shooter system without the curved ramp or the motor. The completed ramp and wheel shooting system.



## Engineering Notes (12/27/17)

Session: 11

Location: Arjun's Garage

Attendance: Euan, Parva, Yiming, Aaron, JingWen, Sophie, Aryan, Ganesh

Coaches: Coach Raj

Note Taker(s): Euan, Parva, Aaron

<b><u>Objectives</u></b>	<b><u>Achievements</u></b>	<b><u>Issues and Concerns</u></b>
Create the ball storage system and a pathway for the ball to go to the shooter	Finalized an idea of how the "storage" system would work. Created stands for the primary intake ramp.	Unsure of where the shooter will be situated (as in the exact dimensions of space the shooter will take IN REGARDS to the overall robot). Unsure of how the ball will avoid being shot out while the motor is accelerating (shooting at a lower speed)
Remove excess space from the shooter and refine the shooter overall	Removed a portion of wood from the shooter	Found that the bearings for the shooter's axel were pointing the wrong direction (where the bearings would fall out)
Create a way to add electronics to the robot while having it to be easily accessible	Cut through plexiglass that fit the shape of the robot	

### **Objectives & Work Done**

- We finally concluded that there would be an intake ramp that would bring the ball into the robot, then a second ramp would point downwards towards the back of the robot (where gravity would be used in order to move the ball to the shooter), and finally guiding "rails" would be curved for the ball to go into the shooter itself. Stands were made for the primary intake ramp so that the first ramp would be raised for the ball to then roll onto another metal sheet into the back of the robot.
- We believed that the shooter was taking up too much space, so we sawed off a portion of unnecessary wood that was part of the shooter's base.
- The electronics are now planned to be placed on the bottom of the robot, on a piece of plexiglass which would be riveted to the robot on the underside. A piece of plexiglass was cut to make way for the wheels and the plexiglass is ready to be riveted.

### **Problems** *What problems did we face and how did we solve or attempt to solve these?*

- We were unsure of where the shooter would be positioned in regards to the second "storage" ramp. So, instead of interfering with the work of others, we decided to focus on the primary intake ramp first
- As of right now, we still haven't thought of a solution in regards to the shooter shooting a ball while the motor is accelerating, which would skew the speed of the ball

- In regards to the bearing in the wrong area, we basically removed the wheel part of the shooter and replaced the bearings into the correct place (inside of the holder)

### **Research** *What did we have to learn about in order to move forward?*

- N/A

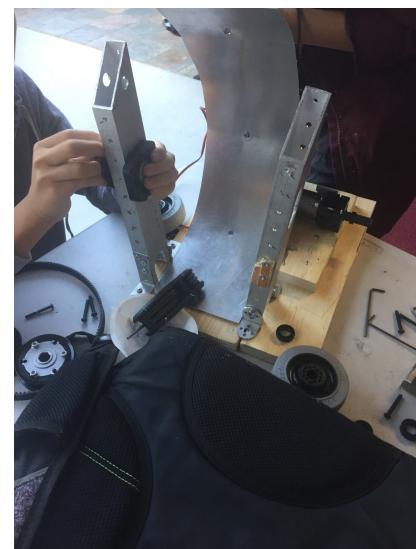
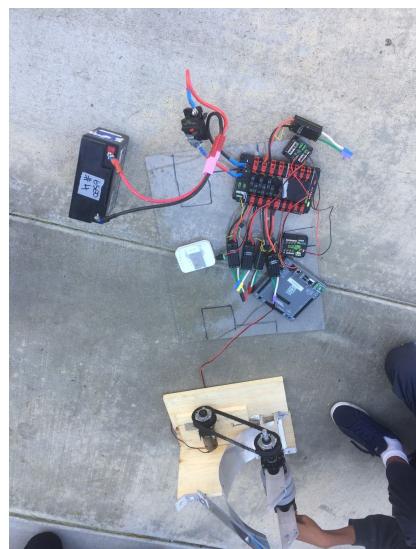
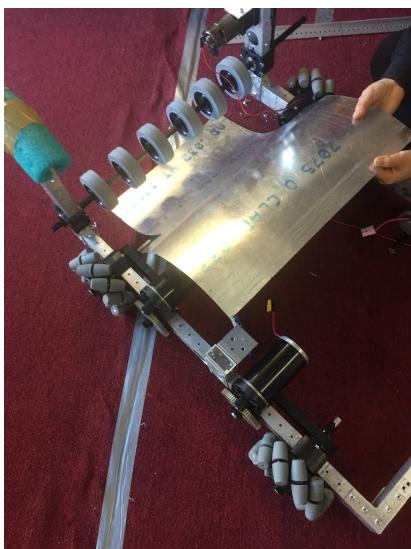
### **Decisions Made** *What progress did we make? What was achieved?*

- Created stands for the primary ramp
- Removed excess wood from the shooter
- Cut plexiglass in the correct dimensions for the underside of the robot
- Fixed the bearings of the shooter

### **What we learned** *What mistakes did we make and what can we learn from them?*

- We learned that we had to stop discussing possible ideas and brainstorming, but instead we should actually start doing something (shout out to Coach Raj's speech).
- We also learned to split up people more to have more things done at once, instead of having a large group work on something. we split up into small groups of 2 and refer to each other when we needed assistance.

### **Pictures**



## **Engineering Notes (12/28/17)**

Session: 12

Location: Arjun's Garage

Attendance: Aaron, Albert, Anish, Arjun, Aryan, Euan, Jaimie, Jason, Jingwen, Sophie, Yiming

Coaches: Coach Raj

Note Taker(s): Euan, Jason

<b><u>Objectives</u></b>	<b><u>Achievements</u></b>	<b><u>Issues and Concerns</u></b>
Create stands for the primary ramp	Finished creating stands	
Create method of holding electronics on the side of the robot	Created "wall" surface for the robot and almost finished zip-tying most of the electronics onto the robot "wall"	Some electronic parts still falls off because of the weak duct tape
Create platform to hold the battery	Finished with adding plexiglass onto the bottom of the robot and adding a battery holder (riveted onto the plexiglass)	Battery might crack the plexiglass
Create holes for the first intake ramp to be riveted	Drilled holes in first intake ramp	
Create the shooter mechanism based off of the prototype shooter	Added more support walls for the shooter and positioned the motor for the shooter in a better spot	The "better" spot of the motor causes the belt to be not aligned correctly (slanted)

### **Objectives & Work Done**

- Finished with creating stands for the primary intake ramp, but there was a change of plans so that stands were no longer needed
- Wall surface was created and attached to the robot, and electronics were zip-tied to the surface
- Added plexiglass to the underside of the robot and mounted battery holders onto the plexiglass
- Drilled holes into the primary intake ramp to be riveted onto the stands of the robot
- Shooter got new side and back supports and the shooter motor was repositioned

### **Problems** *What problems did we face and how did we solve or attempt to solve these?*

- Wires of the wheel motors needed to be longer in order to reach the electronics "board".  
(Solved by adding extensions to the wires)

### **Research** *What did we have to learn about in order to move forward?*

- N/A

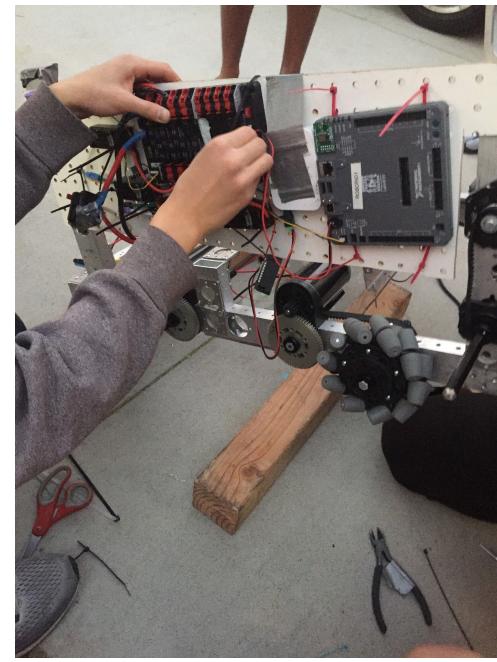
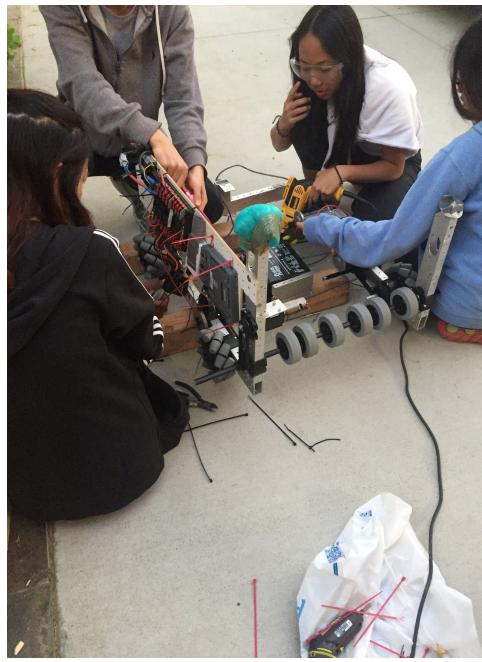
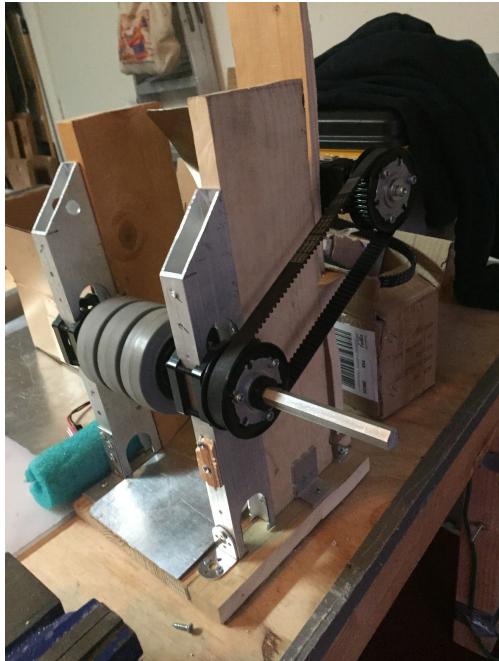
## **Decisions Made** *What progress did we make? What was achieved?*

- Attach electronics to the side of the robot by zip-tying it
- Decide to put the battery on the very bottom of the robot and in the middle (in order to distribute the weight)
- Add more supports for the shooter so that the ball trajectory would be more consistent.

## **What we learned** *What mistakes did we make and what can we learn from them?*

- Ideas and plans may change on the fly, such as the extra stands for the primary intake ramp. So we must be willing to accept those changes in ideas and continue to work accordingly.

## **Pictures**





## Engineering Notes (12/29/17)

Session: 13

Location: Arjun's Garage

Attendance: Aaron, Albert, Anish, Arjun, Aryan, David, Euan, Jamie, Jingwen, Krish, Parva, Yiming

Coaches: Coach Raj

Note Taker(s): Albert, David, Aryan

<b>Objectives</b>	<b>Achievements</b>	<b>Issues and Concerns</b>
Install new electrical components to sideways breadboard	Finished routing of wires and cleanup of electrical components	Needed to drill holes into battery platform plexi-glass
Fix shooter motor	Aligned properly, shoots fine	Range and accuracy still unknown
Coding new drivetrain map	Motor controllers wired up correctly	Direction of motors wrong Unknown networktable exception
Attach ramp for intake and re-orient battery holder	Objectives accomplished	Need to put guard rails on for intake ramp

### **Objectives & Work Done**

Electrical breadboard attached to the side, and all connections routed out of the way of moving parts and other subsystems

New orientation for battery holder implemented

Intake ramp affixed

Shooter motor re-aligned

### **Problems**

Electrical wires running through the air from the drivetrain to the breadboard - fixed by running them under plexi-glass through holes

### **Research**

*NetworkTable exception found to have been caused by initialization of preferences in code*

### **Decisions Made**

Breadboard put on sideways

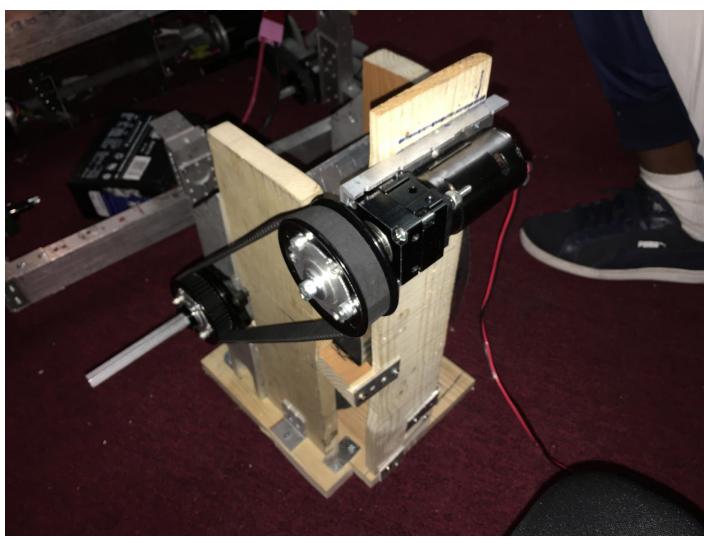
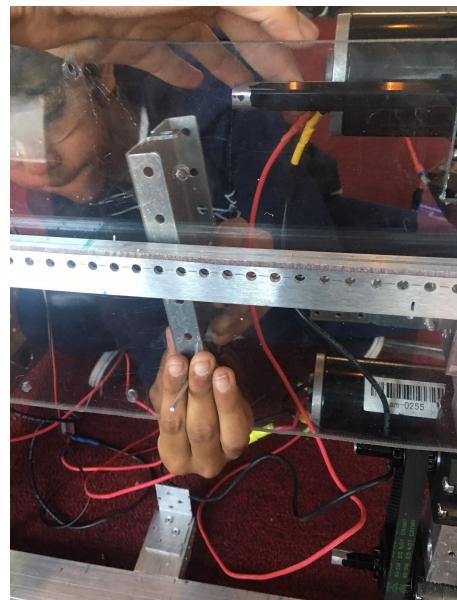
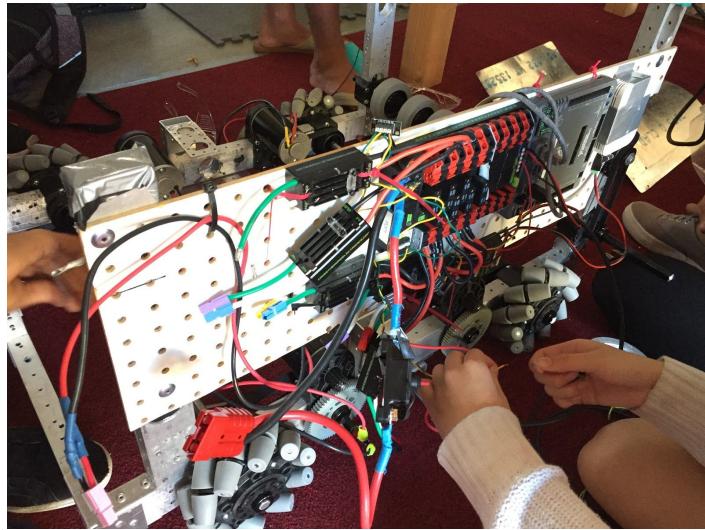
Wires run underneath the plexi-glass

Battery orientation rotated

### **What we learned**

*The battery holder needed to be re-oriented for easy replacement of battery when intake ramp is attached*

## Pictures



## Engineering Notes (12/30/17)

Session: 14

Location: Arjun's Garage

Attendance: Arjun, Jun, Albert, Jason, Aaron, Parva, Yiming, Krish, Jamie, Euan, David, Anish

Coaches: Coach Raj, Coach Raja

Note Taker(s): Yiming, Jamie, Arjun

<b>Objectives</b>	<b>Achievements</b>	<b>Issues and Concerns</b>
Install a sideboard to prevent balls from intake from falling out while creating somewhat of a storage	The sideboard (wall) was attached after riveting another metal support onto the chassis	Needed to remove some difficult rivets off of an old part (we were reusing the metal bar)
Create supports for the shooter system to be attached to the robot and attach the shooter if possible	Supports were built and riveted to the chassis, the shooter is still not attached	
Create a few supports to prevent the battery from sliding out of its holder	The supports to prevent the battery from sliding out were attached to the battery holder. Battery fits and the holder functions correctly.	

### **Objectives & Work Done**

A sideboard opposite to the breadboard was attached to the side, in hopes of preventing balls from falling out after entering the robot.

Supports for the shooter were created and attached to the robot.

### **Problems** *What problems did we face and how did we solve or attempt to solve these?*

### **Research** *What did we have to learn about in order to move forward?*

### **Decisions Made** *What progress did we make? What was achieved?*

We decided to make the shooting system point to the left side of the robot rather than the right side and also shifted the corner in which the system was placed.

### **What we learned** *What mistakes did we make and what can we learn from them?*

### **Pictures**