

PreSeason Notebook
Engineering Notebook (09/22/18)

Session: 1

Location: 116 Capeberry, Irvine, CA 92603

Attendance: Jamie, Yiming, Jingwen, David, Selina, Alicia, Rohan, Thomas, Arjun, Aaron, Krish, Parva, Euan, Adrin

Mentors/Coaches: Coach Raj, Coach Srinivas

Notetakers: Aaron, Albert, Jaimin, Arjun, Adrin

<u>Objectives</u>	<u>Achievements</u>	<u>Issues and Concerns</u>
Build & Design:		
CAD and Design: See CAD Notebook. We have decided to restructure CAD and Design to have independent and separate documentation.		
Electrical: Familiarity with the control system Disassemble practice robot's control system Construct a simple, complete, end-to-end system to control a motor Connect the Talon SRX motor controllers to the roborio Programming: Setup the programming environment Program the motion of the motors Connect the Joystick to the computer and connect it to the motor Create the program for the velocity and acceleration of the motor Program the tank mode for the robot	Electrical: Familiarity with the control system - Yiming, Jamie, Thomas Disassemble practice robot's control system - Yiming, Jamie, Thomas Construct a simple, complete, end-to-end system to control a motor - Yiming, Jamie, Thomas Connect the Talon SRX motor controllers to the roborio - Adrin, Jamie, Jack Programming: Setup the programming environment - Rohan, Adrin Program the motion of the motors- Adrin, Jamie, Jack Connect the Joystick to the computer and connect it to the motor- Adrin, Jamie, Jack	Few had installed the necessary IDE and plugins or even brought their laptops Cannot connect to the RoboRio web-based configuration Work-in-Progress Electrical: Familiarity with the control system - Adrin, Rohan, Jaimin Programming: Setup the programming environment - Adrin, Jamie, Thomas, Rohan Connect to the RoboRio - Adrin, Jamie Figure the best method for programming the tank mode of the robot

	Create the program for the velocity and acceleration of the motor- Adrin,Jamie, Jack	
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Objectives & Work Done

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 Notebook (09/23/18)

Session: 2

Location: 116 Capeberry, Irvine, CA 92603

Attendance: Jamie, Yiming, Jingwen, David, Selina, Alicia, Rohan, Thomas, Arjun, Aaron, Krish, Parva, Euan, Adrin

Mentors/Coaches: Raj, Rama, Hamid

Notetakers: Selina, David, Jingwen, Jamie

Objectives	Achievements	Issues and Concerns
Fundraising & Outreach: <ul style="list-style-type: none">• Elaborate on last year's business plan• Add on to graph with Corporate matching and parents	<ul style="list-style-type: none">• Completed Mission Statement and Origin.	<ul style="list-style-type: none">• There are not many people working on the business plan so it will be difficult to complete it efficiently
CAD: <ul style="list-style-type: none">• Brainstorm ideas for the preseason mission• Continue from yesterday and teach new members of the cad team skills• Practice with sample files and create/assemble parts	<ul style="list-style-type: none">• Decided on a design for the mission using a grabber, ramp, and pulleys for the intake, storage, and shooter• Started looking at sample files and practicing with CAD inventor• Looked at drivetrain ideas for the model	<ul style="list-style-type: none">• Learning curve is relatively high with estimated completion of training probably extended a week
Programming/Electrical: <ul style="list-style-type: none">• Organized control system components• Calculated power pulled out of battery from the motors	<ul style="list-style-type: none">• Got more familiar with control system components and their functions.• Also learned more about the connections.	<ul style="list-style-type: none">• Difficulty uploading code onto allocated roborio, decided to obtain roborio from last year's robot
Build/Design: <ul style="list-style-type: none">• Create a spreadsheet to evaluate different drivetrain components (gearbox, wheels, etc.) and setups• Begin drafting a design for chassis that will be standardized for all robot builds	<ul style="list-style-type: none">• Completed spreadsheet of drivetrain analysis with the next step being deciding what combination and setup to standardize• Drafted a chassis design and began modeling it on Inventor	<ul style="list-style-type: none">• Lack of clarity over dimensions and specifications of chassis design

Objectives & Work Done

- Finalize a list of tools and parts for initial procurements
- Begin a drivetrain design and create an assembly of design on inventor

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

- Relatively steep learning curve for CAD curriculum which will probably push training completion back a week

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

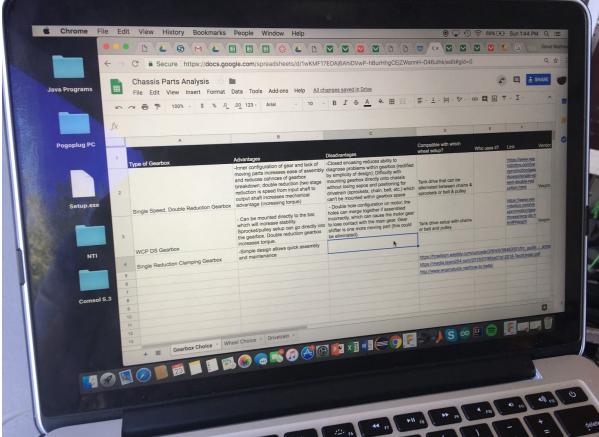
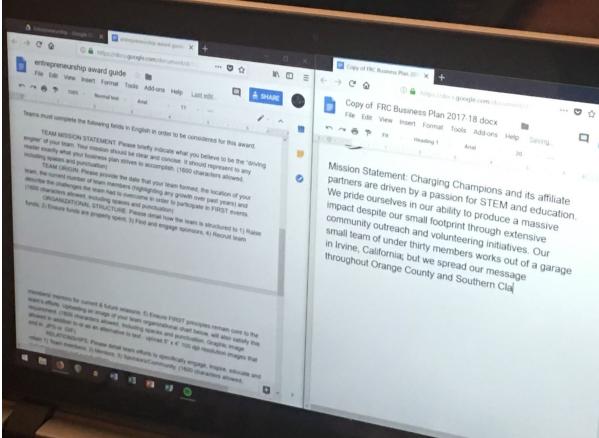
- Looked up the advantages and disadvantages of different drivetrain setups
- Looked up the pin-out/schematic for different electrical components

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

- Drafted a rough design for the chassis that will help with long-distance precision during both autonomous and tele-op, involves small changes and evolution from last year's chassis.

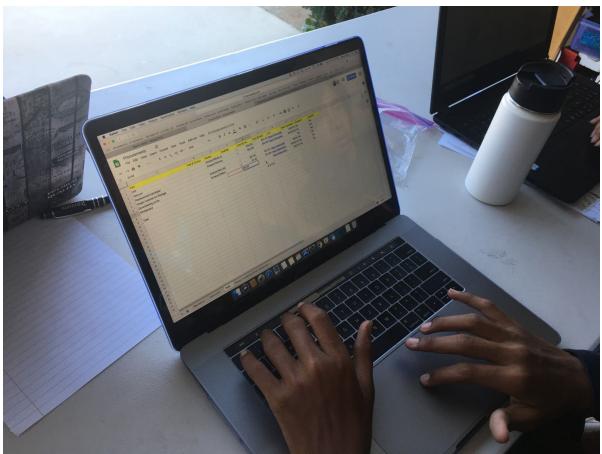
What we learned *What mistakes did we make and what can we learn from them?*

Pictures

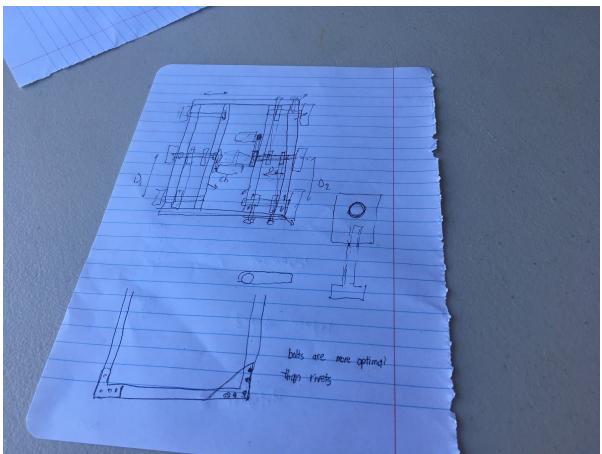
	<p>Created a sheet for analyzing the advantages and disadvantages of different drivetrain setups and combinations.</p>
	<p>Updating and finalizing mission statement and business plan</p>



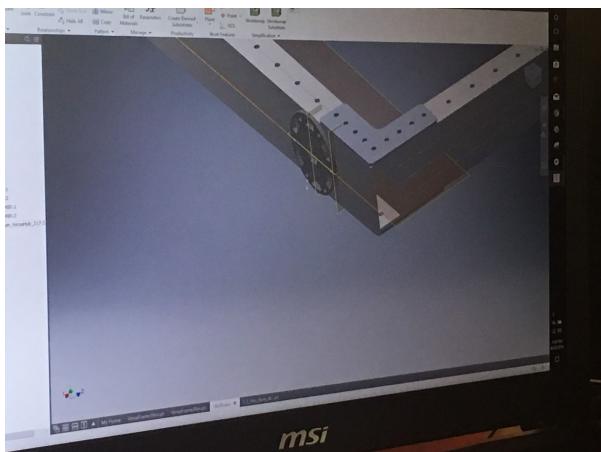
Worked on assembling the electronics along with drafting control system schematics and attempted to upload code into Roborio



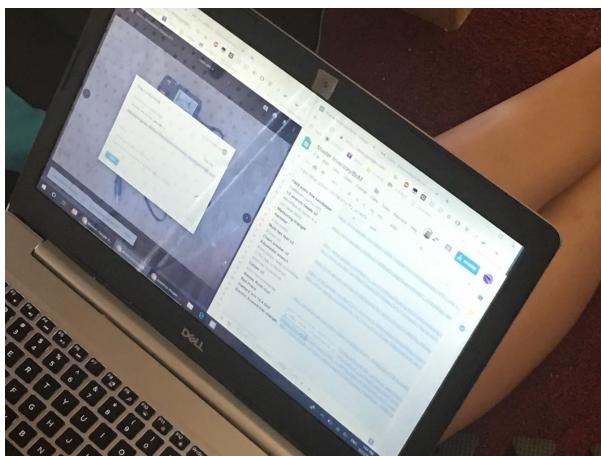
Drafted an early list of tools and other items for procurements



Initial rough draft of chassis design that will be modeled in Inventor



Continuation of CAD team's curriculum for members interested in learning CAD



Continued taking inventory; today we worked on taking images and linking them all the parts, also worked on categorizing the parts to organize the garage next week

Engineering Notebook (09/29/18)

Session: 3

Location: 116 Capeberry, Irvine, CA 92603

Attendance: David, Arjun, Albert, Aaron, Jingwen, Jamie, Alicia, Selina, Parva, Krish, Euan, Yiming, Thomas, Adrin, Jaimin

Mentors/Coaches: Raj, Rama, Srini, Hamid

Notetakers: David, Parva, Alicia, Jaimin

Objectives	Achievements	Issues and Concerns
Fundraising & Outreach: <ul style="list-style-type: none">Organize matching plan	<ul style="list-style-type: none">Created algorithm for maximizing revenue	<ul style="list-style-type: none">Corporate Approval may be a concern
CAD: <ul style="list-style-type: none">work on the initial chassis designCAD Learners continue to experiment with Autodesk Inventor by constructing personal chassis design	<ul style="list-style-type: none">N/A	<ul style="list-style-type: none">CAD learners continue to flounder
Programming/Electrical: <ul style="list-style-type: none">Take programming interviews (in the morning)Set up programming environment by installing necessary files/software on each member's computerConnect computers to RoboRioGrade programming interviews?	<ul style="list-style-type: none">Installed necessary stuff on most member's computersConnected to RoboRio	<ul style="list-style-type: none">Were not able to connect Adrin's computer to RoboRio at firstWere not able to make Talon SRX motor controller connect
Build/Design: <ul style="list-style-type: none">Begin calculating estimated performance output from motorsBegin disassembling last year's backup robotSettle on a drivetrain setupCreate a design for belt-tightening module	<ul style="list-style-type: none">Made a BTM 1.0 and BTM 2.0 design to fabricate next meeting	<ul style="list-style-type: none">

Objectives & Work Done

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?*

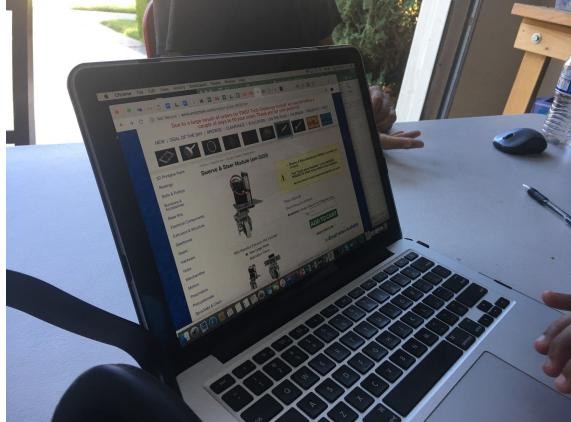
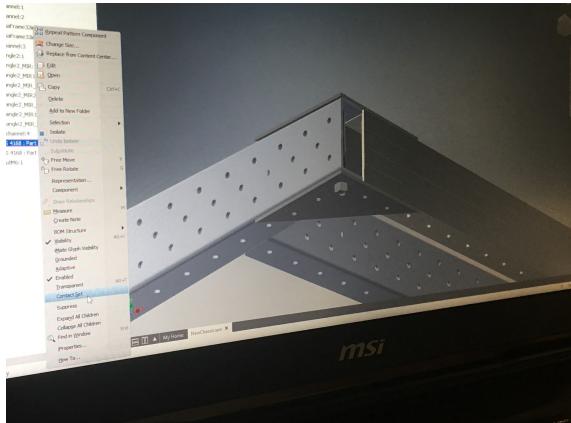
- Looked online for CIM motor performance specifications
- Researched AndyMark Swerve drive module and general reviews on performance. Additionally looked at graphical analysis of the varying difficulty levels of drivetrain setups

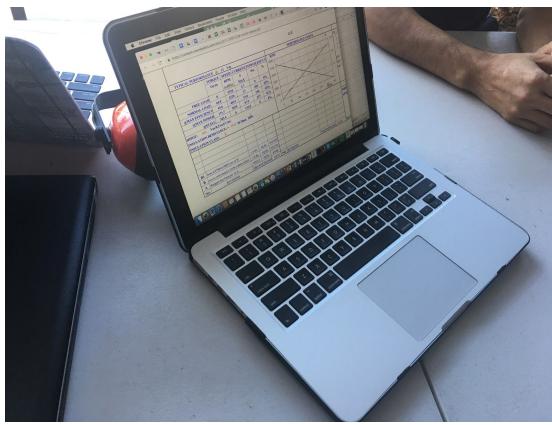
Decisions Made *What progress did we make? What was achieved?*

- Decided upon doing one Swerve drive chassis and a tank drive chassis

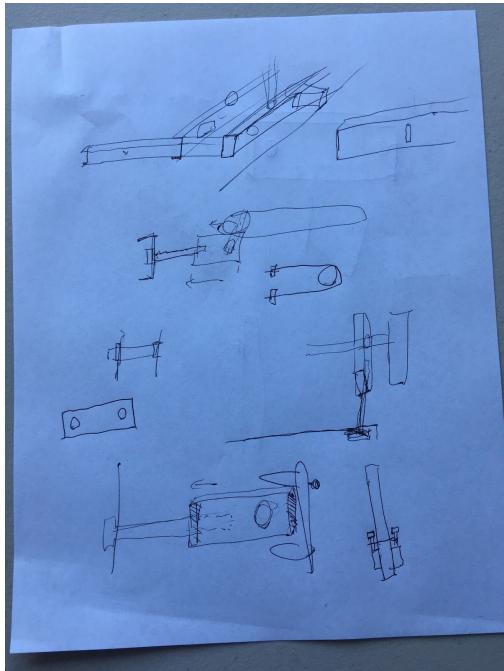
What we learned *What mistakes did we make and what can we learn from them?*

Pictures

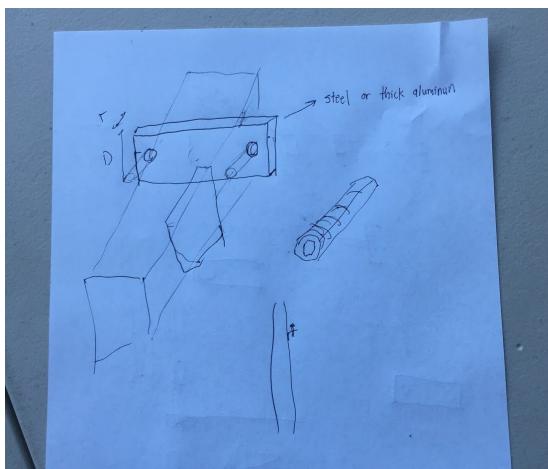
	Researching AndyMark swerve drive module along with specifications and the implementation
	Continuing the modeling for the new tank-drive chassis design



Examining the specifications for CIM motor to calculate the estimated driving speed for the robot



Initial design for belt-tightening module, involving piece, potentially 3d-printed, with a tapped hole through the center for an M5 screw that will be attached to the front/rear C-Channel. Piece has a hole with a bearing for hex shaft. As screw is turned, the shaft axis will be pulled back, tightening the belt. Module is expected to be flush against the inside of aluminum frame.



Secondary design for belt-tightening module. Involves a much simpler design that is removable and much easier to fabricate. Involves getting a piece of steel or aluminum around .375" that slides through a slot in the aluminum frame. On either side, there are two tapped holes where M4 or M5 set screws will be used to push the Versa bearing blocks to tighten the belt as opposed to the pulling motion in the previous design.



Disassembly of last year's backup robot

Engineering Notebook (09/30/18)

Session: 4

Location: 116 Capeberry, Irvine, CA 92603

Attendance: David, Arjun, Aaron, Jamie, Alicia, Krish, Euan, Yiming, Thomas, Jaimin, Sriyan

Mentors/Coaches: Raj, Rama, Srini, Hamid

Notetakers: David, Krish, Yiming, Jaimin

Objectives	Achievements	Issues and Concerns
Fundraising & Outreach: <ul style="list-style-type: none">Finish business plan and fundraising objectives, make revisions if necessary	<ul style="list-style-type: none">Business plan progress was madeFundraising objectives solidified	<ul style="list-style-type: none">Will we be able to achieve our objectives?Business plan isn't pretty
CAD: <ul style="list-style-type: none">Begin modeling chassis incorporating serve drive moduleContinue producing model for revised tank driveCreate model of belt-tightening module 2.0Continue CAD curriculum		
Programming & Electrical: <ul style="list-style-type: none">Continue troubleshooting as to why the motor controller is not detected by the RoboRIO interfaceUpdate the firmware for the electrical system	<ul style="list-style-type: none">Figured out why the motor controllers was not detected and fixed the issue (connected another CAN cable to the RoboRIO)Firmware updated	
Build/Design: <ul style="list-style-type: none">Continue disassembling last year's backup robot		

Objectives & Work Done

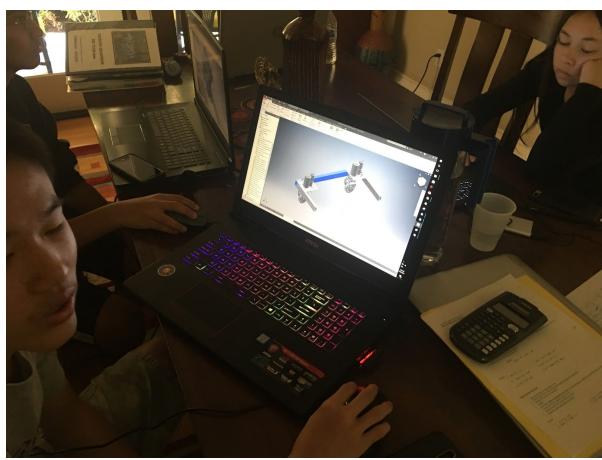
Problems *What problems did we face and how did we solve or attempt to solve these?*

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

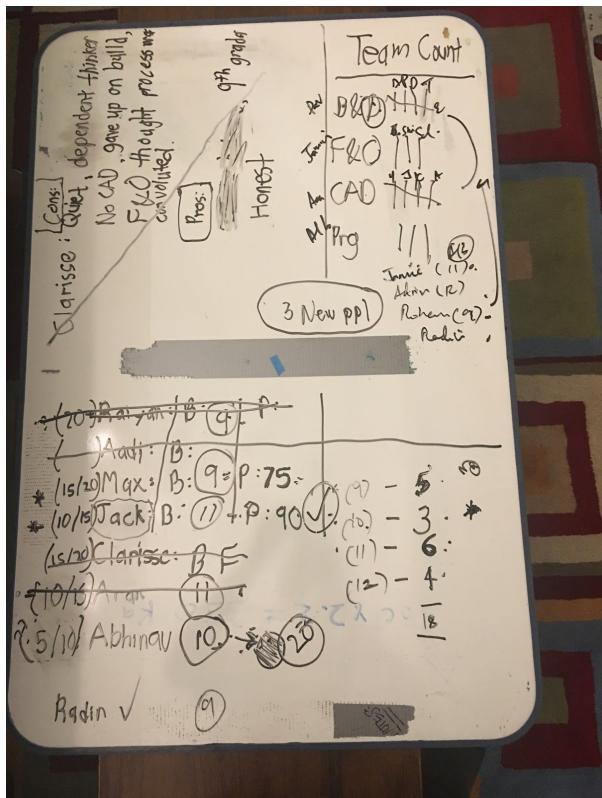
Decisions Made *What progress did we make? What was achieved?*

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

Pictures



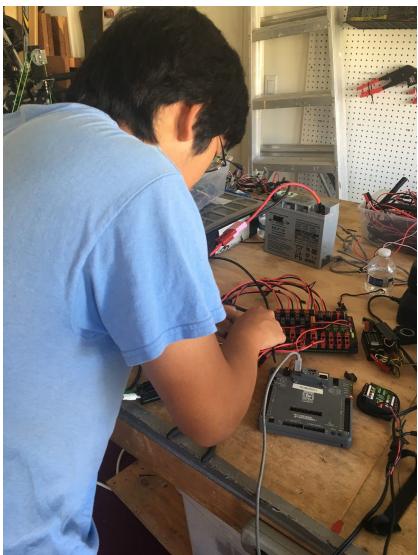
Beginning model for Swerve drive modules attached to chassis



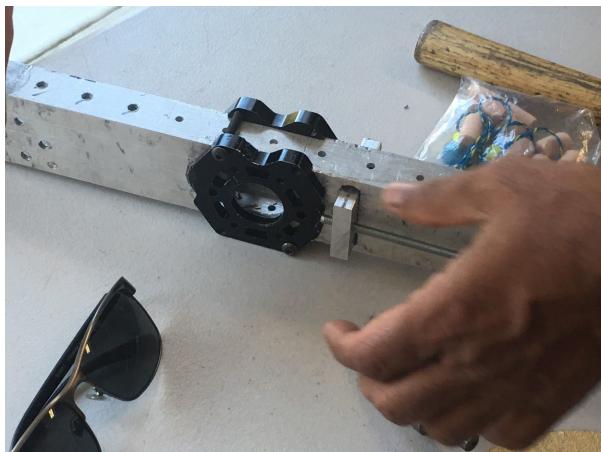
Finalized discussions over applicant selections and evaluations.



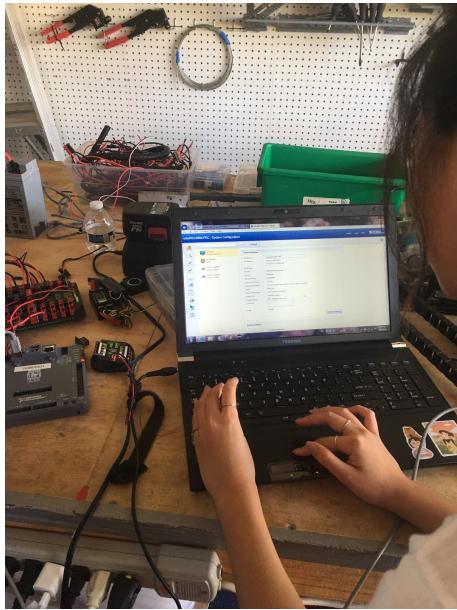
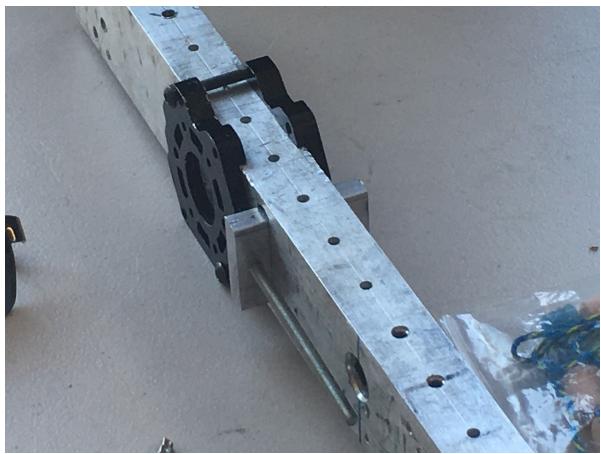
Continued disassembly of last year's backup robot.

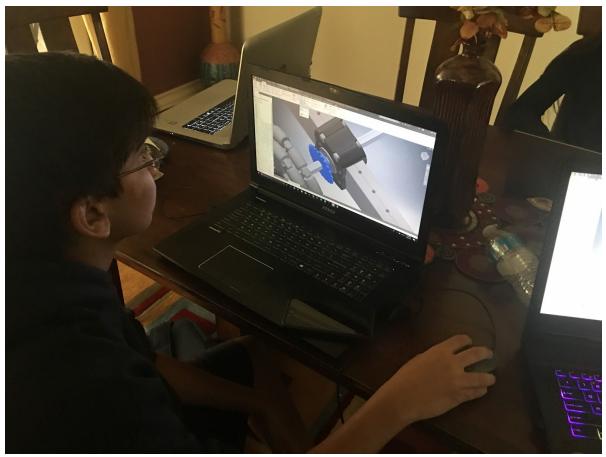


Connected another CAN cable from the PDP to the RoboRIO to fix the problem with the detection of the motor controller



Fabricated a rough prototype of the belt-tightening module 2.0. Came up with several improvements to make in next draft.





CAD team continued to go through curriculum with today's work consisting of making full drivetrains.

Engineering Notebook (10/05/18)

Session: 5

Location: 116 Capeberry, Irvine, CA 92603

Attendance: Yiming, Euan, Thomas, Jack

Mentors/Coaches: Raj

Notetakers: Yiming, Euan, Thomas, Jack

<u>Objectives</u>	<u>Achievements</u>	<u>Issues and Concerns</u>
Build/Design: <ul style="list-style-type: none">Finish disassembling the chassis of the 2018 Backup Robot.	<ul style="list-style-type: none">Finished the disassembling of the chassis; there are a few smaller pieces that can be salvaged	

Objectives & Work Done

- Disassembled chassis and most of other small pieces (brackets etc)
- Inventoried newly arrived tools
- Cleared some of the table

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

- Only having one powerful electric drill limited workload; Split work up and used less powerful battery drill.

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?*

- Split people up to disassemble different parts of the robot so that workload efficiency is maximized.

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

- Accidentally drilling at an angle while removing a rivet, causing the rivet to be more difficult to remove. Learn to not drill at an angle.

Pictures

Engineering Notebook (10/07/18)

Session: 6

Location: 116 Capeberry, Irvine, CA 92603

Attendance: David, Selina, Sriyan, Rohan, Yiming, Euan, Jamie, Jingwen, Albert, Alicia, Thomas, Krish

Mentors/Coaches: Raj, Rama

Notetakers: David, Albert, Alicia, Sriyan

Objectives	Achievements	Issues and Concerns
Build/Design: <ul style="list-style-type: none">• Looking to finalize chassis & drivetrain design• Finalize belt-tightening module with a final POC• Create a list of parts needed to fabricate initial chassis• Hold a discussion over preseason missions	<ul style="list-style-type: none">• Settled Melt-tightening module (BTM) 3.0 with intent of making CAD model• Decided upon doing a ball intake-shooter system• Continued refining chassis/drivetrain design	
Programming/Electrical: <ul style="list-style-type: none">• Connect to Talon SRX motor controller• Push code to create minimally operational electrical system	<ul style="list-style-type: none">• found new third party libraries needed for TalonSRX• Updated RoboRio with necessary Phoenix framework with Hero Lifeboat	<ul style="list-style-type: none">• will there be compatibility issues with the TalonSRX new and old libraries?
CAD: <ul style="list-style-type: none">• Begin modeling the chassis and drivetrain design for preseason robot along with the new belt-tightening module• Begin delegating design objectives within team (drivetrain/chassis or missions)	<ul style="list-style-type: none">• Continued work on preseason chassis design• Design objectives delegated<ul style="list-style-type: none">◦ Krish and Rohan are now working on an intake system for balls◦ Alicia and Selina are now working on a Tank Drivetrain and Swerve Drivetrain	

Objectives & Work Done

- Succeeded in connecting to RoboRio and accessories over web-based config

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

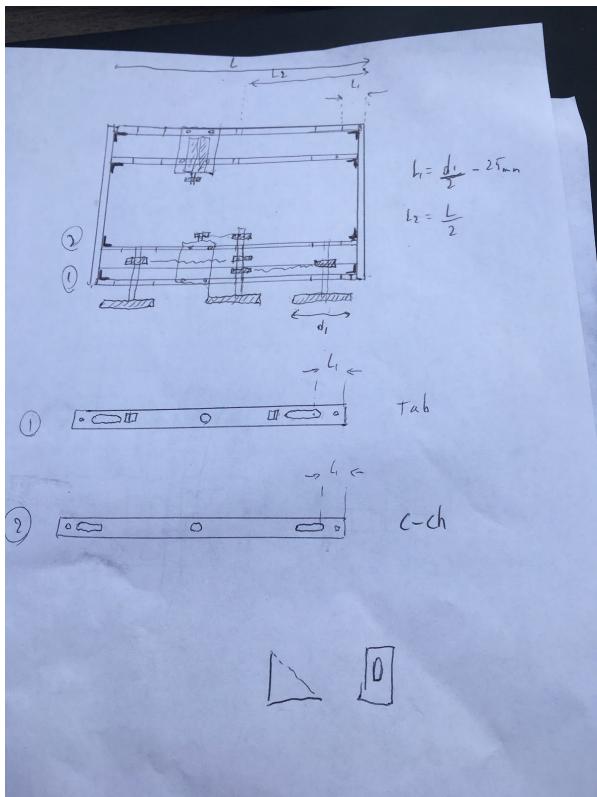


POC of redesigned belt-tightening module
(this is module 3.0 and will likely be final design with some minor changes and refinements)

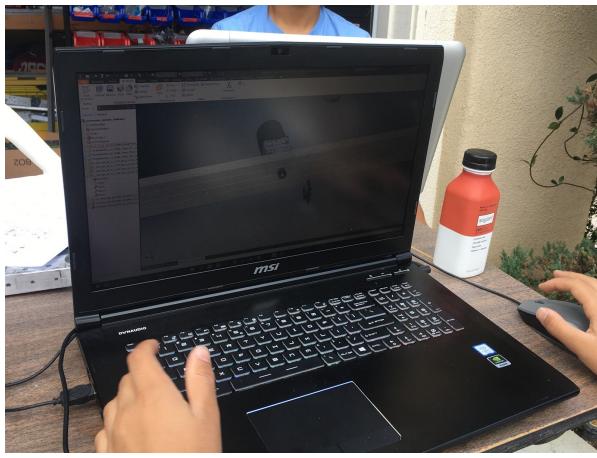


New CAD team members working on drivetrain/chassis modeling with practice oriented around swerve drive and tank drive





Refined chassis design along with more detailed dimensions



CAD Team working on intake design for potential mission

Engineering Notebook (10/08/18)

Session: 7

Location: 116 Capeberry

Attendance: yes

Mentors/Coaches: Coach Raj

Notetakers: Jaimin Patel, David Kurniawan, Jack Liu, Aaron Fu

<u>Objectives</u>	<u>Achievements</u>	<u>Issues and Concerns</u>
Fundraising/Outreach: <ul style="list-style-type: none">• Organize parent meeting agenda and forms• Finish business plan• Letter to car dealer, gather materials, prepare pitch	<ul style="list-style-type: none">• Finished form, finalized date of meeting• Business plan complete• Completed draft of letter along with necessary materials and pitch	Which sensitive information to gather
CAD <ul style="list-style-type: none">• Continue designing and finishing preseason chassis• Work on drivetrain curriculum for newer CAD members on the team	<ul style="list-style-type: none">• Successfully made great progress in refining the chassis, updating CAD models with new dimensions• Constrained dimensions and assembly to fit more accurately and integrated specialized, custom parts into CAD model	
Build/Design <ul style="list-style-type: none">• Worked with CAD team on preseason chassis	<ul style="list-style-type: none">• Chassis design and modeling in progress	

Objectives & Work Done

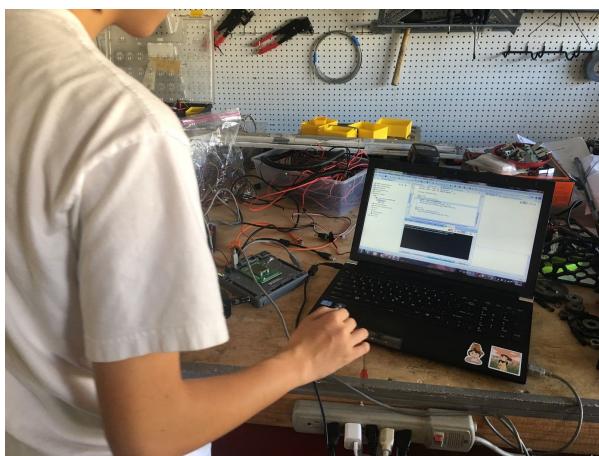
Problems *What problems did we face and how did we solve or attempt to solve these?*

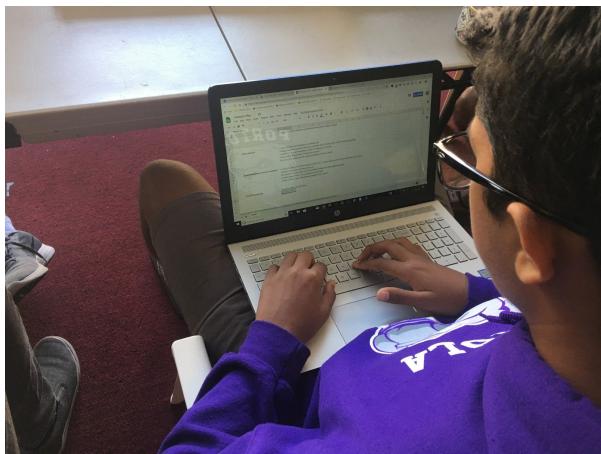
Research *What did we have to learn about in order to move forward?*

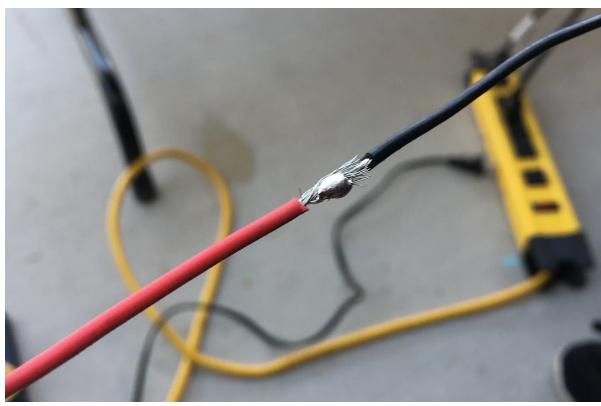
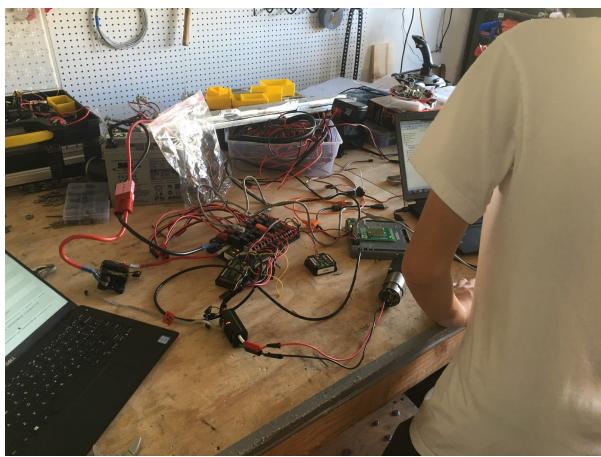
Decisions Made *What progress did we make? What was achieved?*

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

Pictures







Engineering Notebook (10/13/18)

Session: 8

Location: 116 Capeberry

Attendance: Aaron, Albert, Alicia, Jamie

Mentors/Coaches:

Notetakers: Selina, Albert

<u>Objectives</u>	<u>Achievements</u>	<u>Issues and Concerns</u>
CAD: <ul style="list-style-type: none">• Finish the preseason chassis• Place gearboxes in correctly• Attach bearing blocks using workplanes	<ul style="list-style-type: none">• CAD learners completed a large section of what they were instructed	<ul style="list-style-type: none">• Cad learners took a long time to complete a few tasks
Programming: <ul style="list-style-type: none">• Connect to RoboRio via web-based config	<ul style="list-style-type: none">• Successfully got the RoboRio operating as it should• Code is working, Jamie, Jack, Adrin, and Parva have been assigned to individually manipulate the code	development environment for many programmers is still not correctly updated

Objectives & Work Done

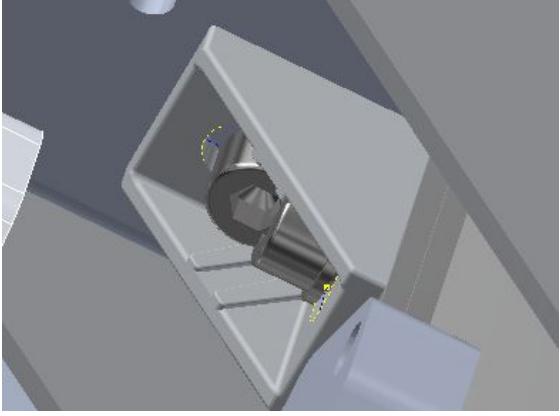
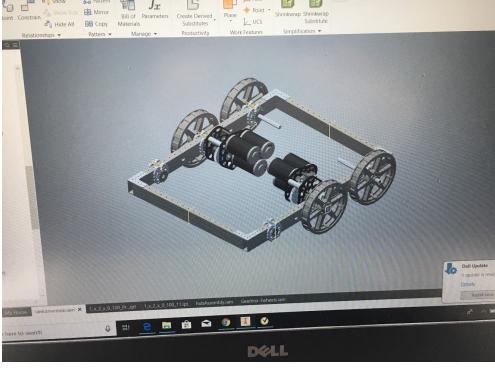
Problems *What problems did we face and how did we solve or attempt to solve these?*

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

	<p>Discovered a problem with screw overlap.</p>
	<p>CAD learners creating a midplane on a bearing block.</p>
	<p>Half completed tank drive chassis.</p>



debugging connection, successfully pushed working code

Engineering Notebook (10/14/18)

Session: 9

Location: 116 Capeberry

Attendance: David, Yiming, Adrin, Jingwen, Rohan, Alicia, Aaron, Selina, Jamie, Jack, Arjun

Mentors/Coaches: Raj, Srinivas, Hamid, Rama

Notetakers: Yiming, David, Sriyan, Jamie

<u>Objectives</u>	<u>Achievements</u>	<u>Issues and Concerns</u>
Build/Design: <ul style="list-style-type: none">(Look at CAD Row)		
CAD: <ul style="list-style-type: none">Finish designing the preseason robot in InventorComplete a practice activity with the newer CAD members	<ul style="list-style-type: none">Preseason robot design almost finishedPractice activity regarding selecting a drivetrain and chassis type started	
Programming/Electrical: <ul style="list-style-type: none">Tried to connect to the driver's station using Albert's laptop	<ul style="list-style-type: none">Eventually connected successfully using Jamie's laptop	<ul style="list-style-type: none">Albert's laptop didn't have up-to-date software yet

Objectives & Work Done

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 Notebook (10/19/18-10/21/18)

Session: 10-11

Location: 116 Capeberry

Attendance: David, Aaron, Jamie, Jingwen, Yiming, Arjun, Adrin, Jack, Alicia, Selina, Rohan, Jaimin, Sriyan

Mentors/Coaches: Raj, Srinivas, Rama, Hamid

Notetakers: David, Aaron, Programming + Electrical Team (Adrin, Albert, Jamie, Jack)

<u>Objectives</u>	<u>Achievements</u>	<u>Issues and Concerns</u>
Fundraising/Outreach: <ul style="list-style-type: none">Organize parent meeting	<ul style="list-style-type: none">Date solidified	<ul style="list-style-type: none">Parent consent to the plan
Build/Design: <ul style="list-style-type: none">Finalize purchases of chassis and drivetrain materials, begin drafting BoM for each and drafting design for elevatorFinalize dimensions and design of drivetrain, work with CAD team to implement onto chassis		
CAD: <ul style="list-style-type: none">Finish modeling chassis and drivetrain with semi-finalized constraint dimensions and layout		
Programming/Electrical: <ul style="list-style-type: none">Figured out the code for the joystick and motorTested code, modified it, and eventually got it to work	Successfully got the code to run and made the joystick control the motor	Common coding errors, class given by Albert initially didn't work on Adrin's laptop

Objectives & Work Done

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 Notebook (10/26/18)

Session: 12

Location: 116 Capeberry

Attendance: David, Yiming, Radin, Euan, Jamie, Jingwen, Jack, Selina

Mentors/Coaches: Srinivas, Hamid

Notetakers: David, Yiming, Jamie, Selina

Objectives	Achievements	Issues and Concerns
Build/Design: <ul style="list-style-type: none">Begin building chassis and drivetrain componentsBegin drafting BoM for drivetrain and chassis	<ul style="list-style-type: none">Made base component for 8 pieces of BTM 3.0Began cutting the C-channel and versa frames for preseason chassisMade rough draft of BoM (lacking hardware specifications, such as screw size, etc.)	<ul style="list-style-type: none">Bandsaw provided plenty of uncertainty and lack of precision as the blade would constantly bend and quiver
CAD: <ul style="list-style-type: none">Check over latest chassis revision to improve and update	<ul style="list-style-type: none">Altered configuration of BTM 3.0 to allow for wheel axle to decrease in length with the main frame widening outwards	<ul style="list-style-type: none">
Programming/Electrical: <ul style="list-style-type: none">We worked with Radin to get him caught up our progress so far	<ul style="list-style-type: none">Radin got the FRC Suite installed on his computer	<ul style="list-style-type: none">Albert and Adrin were absent and we didn't have any separate orders from Albert so we helped out with organization and build

Objectives & Work Done

- **Build & Design/CAD**
 - Look over CAD model to ensure specifications are accurate and incorporate materials we have in inventory
 - Found several mistakes with CAD model, will work on over the following few days
 - Begin drafting BoM for chassis and drivetrain
 - Created a rough draft sheet
 - Begin fabricating chassis
 - Cut C-channel and versaframe tube stock to specifications in CAD model
 - Begin fabricating BTM 3.0
 - Made 8 pieces of BTM 3.0

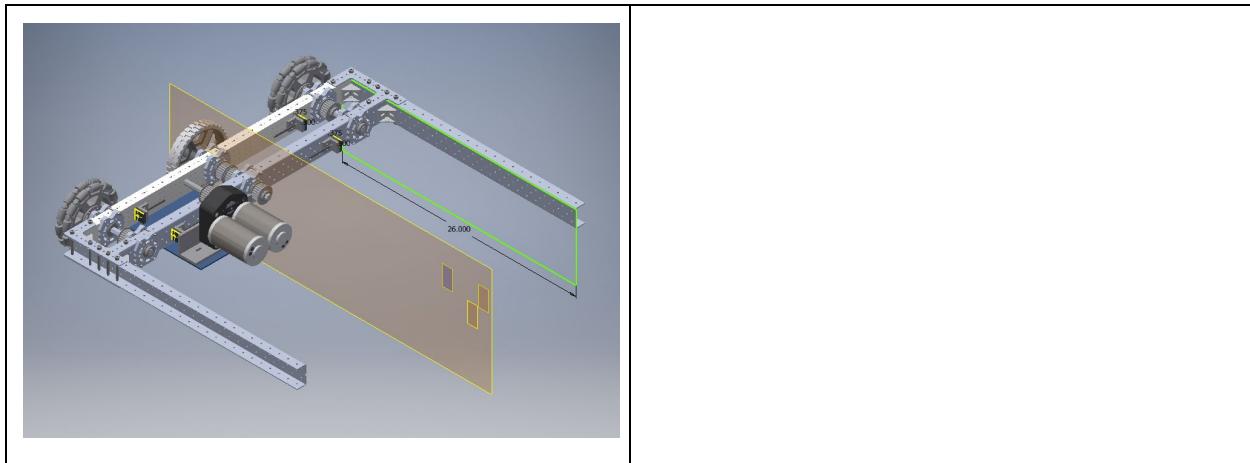
Problems *What problems did we face and how did we solve or attempt to solve these?*

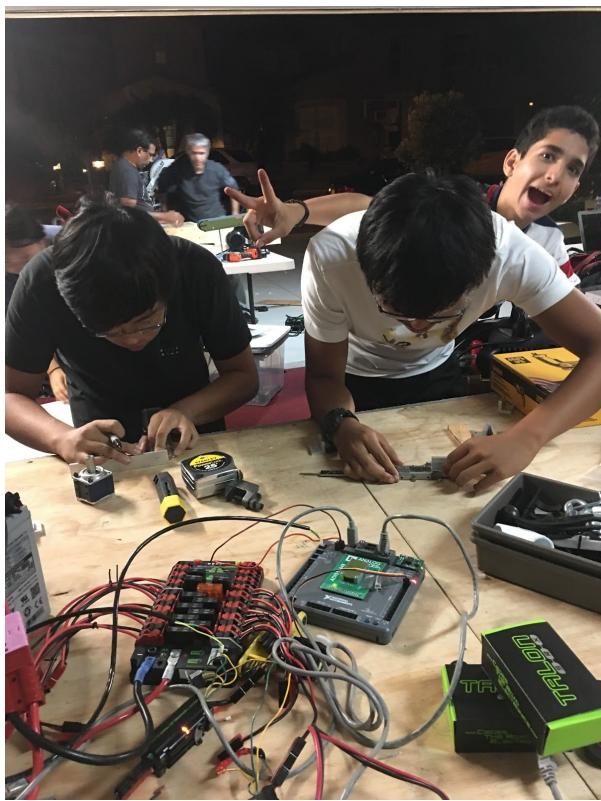
Research *What did we have to learn about in order to move forward?*

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 Notebook (10/27/18)

Session: 13

Location: 116 Capeberry

Attendance: David, Aaron, Arjun, Yiming, Adrin, Jack, Jamie, Jingwen, Selina, Thomas, Rohan, Euan

Mentors/Coaches: Srinivas, Rama, Hamid

Notetakers: David, Aaron, Jamie

Objectives	Achievements	Issues and Concerns
Build/Design: <ul style="list-style-type: none">• Finish making parts for chassis assembly with correct specifications/dimensions• Figure out how to troubleshoot miscut versa frame and c-channels• Continue working on BoM for chassis• Work with CAD team to begin modeling elevator design• Settle on fastening hardware and undergo scrutinizing review of chassis	<ul style="list-style-type: none">• Decided to reuse old versaframe bars for lengthwise component, will need to re-order c-channel for lengthwise part• Continued working on BoM• Decided to constrain pulley lengths rather than adjusting to accommodate miscut chassis	<ul style="list-style-type: none">• David miscut lengthwise C-channel and versaframe from 30" to 29"• For future reference, use miter saw in order to make clean cuts• Need to refine process of checking CAD model before building (see above mistake)
CAD: <ul style="list-style-type: none">• Finalize the CAD model for chassis• Begin modeling elevator design	•	•
Programming/Electrical: <ul style="list-style-type: none">• Coded controller to manage the motors for drive• Tested code with robot from last year	<ul style="list-style-type: none">• Figured out equation to get wheels on both sides of the robot to move when turning(not just one side because that leads to a more circular motion)	<ul style="list-style-type: none">• Initial code we had only moved wheels on one side of the robot when turning• Modified code switched the front and back directions

Objectives & Work Done

- **Build & Design/CAD**

- Take a final scrutinized review over CAD model to ensure everything is “perfect”
 - Checked the belt lengths that are available and matched the pulley positions to ensure dimensions can be implemented, decided to constrain pulley positions, which effectively means we won’t change belt lengths

- Troubleshoot miscut C-channels and versaframe tube stock
 - Decided to use old versaframe tube stock while ordering new C-channels
- Continue working on BoM for chassis and drivetrain
 - Updated BoM with all materials currently settled upon
- Settle on fastening hardware to use in chassis and drivetrain
 - Undergoing search through Inventor Content Library and collaborating with procurements to find closest product on market

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

- **Build & Design/CAD**
 - Chassis frame materials were miscut and not adapted to new CAD model
 - Used bandsaw instead of miter saw to make cuts; this resulted in lack of precision and non-flush cuts

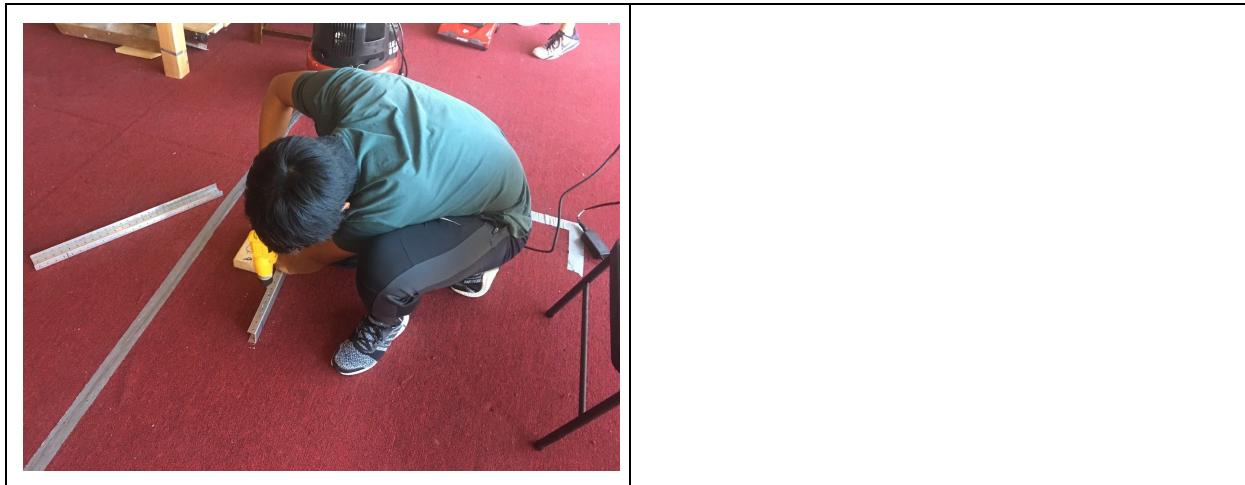
Research *What did we have to learn about in order to move forward?*

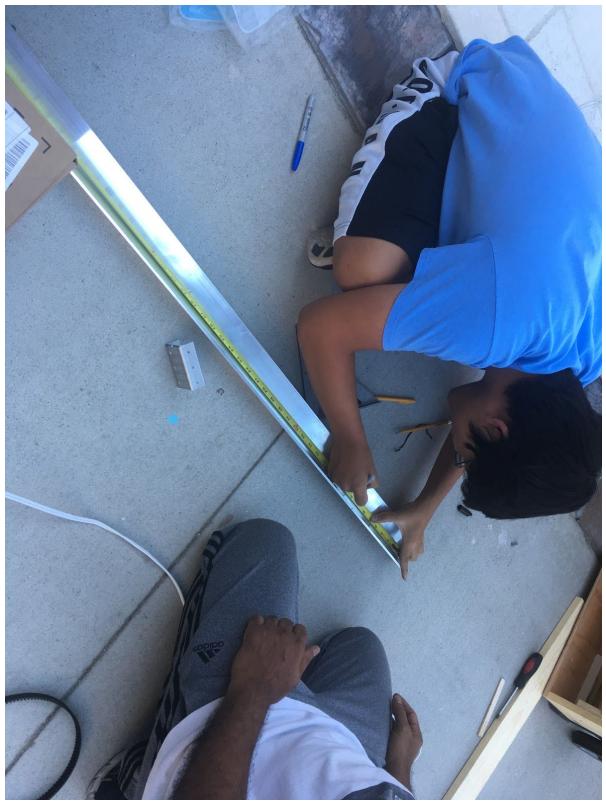
- **Build & Design/CAD**
 - Looked at a variety of screws available for BTM 3.0 and fastening hardware
 - Looked up available belt lengths that could reasonably fit within chassis and drivetrain specifications

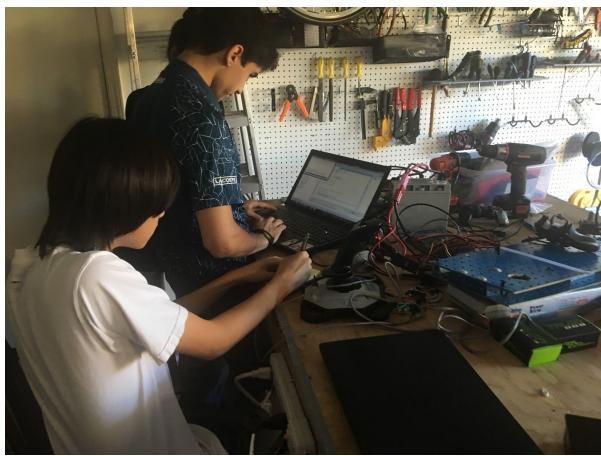
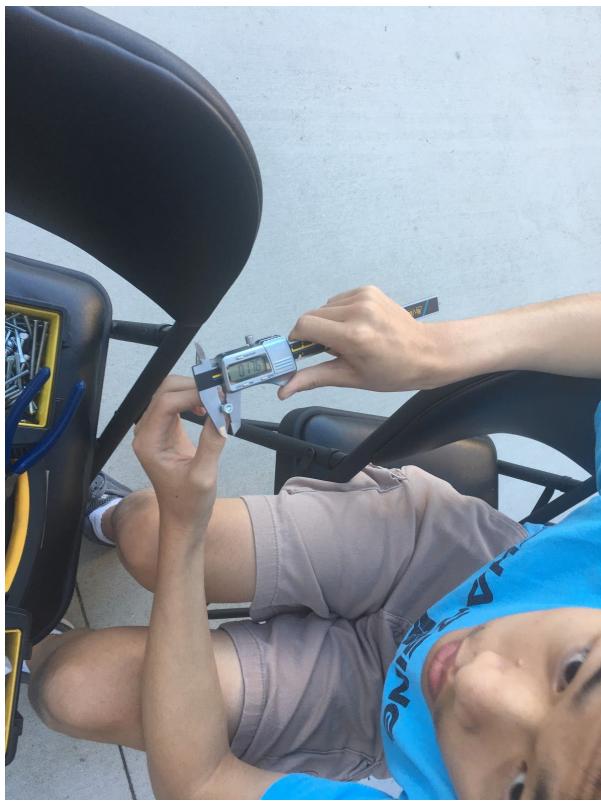
Decisions Made *What progress did we make? What was achieved?*

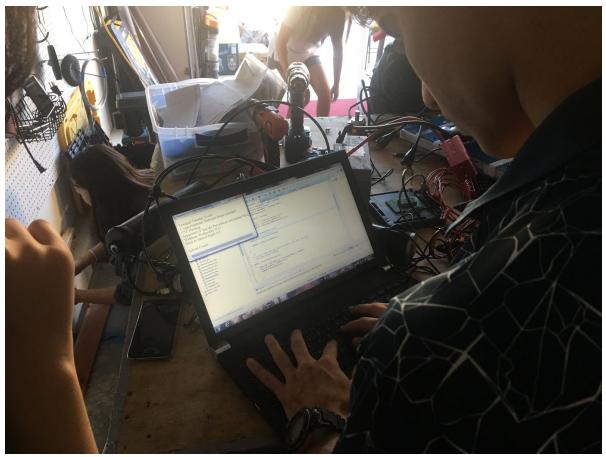
What we learned *What mistakes did we make and what can we learn from them?*

Pictures









Engineering Notebook (10/28/18)

Session: 14

Location: 116 Capeberry

Attendance:

Mentors/Coaches: Srini, Hamid, Rama

Notetakers: Arjun, Albert, Alicia, Jaimin

<u>Objectives</u>	<u>Achievements</u>	<u>Issues and Concerns</u>
Build/Design: <ul style="list-style-type: none">• mill the bars• make the belt-tightening modules• make the parts for the gearbox attachment• start assembling the chassis	<ul style="list-style-type: none">• 1 of 4 bars has been milled.• Belt-tightening module is almost complete.	<ul style="list-style-type: none">• There was no vice, so we could not use the drill press. This slowed operations down.
CAD:		
Programming/Electrical:		
Fundraising/Outreach:		

Objectives & Work Done

- **Build/Design:**
 - Objectives: start assembling the chassis and get all of the parts ready to start assembling the chassis
 - Work done: the belt-tightening module is almost done, and 1 of 4 bars was milled. The motor plate was cut but needs to be slotted and drilled.

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

- **Build/Design:**

○

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 Notebook (11/02/18)

Session: 15

Location: 116 Capeberry

Attendance: David, Jingwen, Radin, Adrin, Sriyan, Parva, Arjun, Yiming, Jack, Max, Alicia, Selina, Euan, Thomas

Mentors/Coaches: Raj, Rama, Hamid

Notetakers: Euan, Rohan, Jack, Sriyan

Objectives	Achievements	Issues and Concerns
Build/Design:	<ul style="list-style-type: none">• Inventoried and sorted newly arrived items.• Capped BTM• Countersunk belt tightening module• Drilled holes in metal plate• Color coded boxes (green for mechanical, red for electronic)	<ul style="list-style-type: none">• Belt tightening module was cut to the wrong length. Will most likely need to redo the whole thing.
Cad:	<ul style="list-style-type: none">• Continued work on cad elevator and chassis system	<ul style="list-style-type: none">• Confusion over design papers
Programming/electric:	<ul style="list-style-type: none">• Finished prototype motor control system and pushed to GitLab• Researched different strategies for autonomous control and settled on using two dummy wheels with encoders to determine robot position and orientation• Decided on the type of encoder to use and read the Phoenix Java API documentation to figure out how to interface with encoders connected to Talon SRXs• Prototype project was updated to use RobotMap instead of hard-coded CAN IDs to make it easier and more efficient to swap motor controllers	<ul style="list-style-type: none">• Because the API for interfacing with Talon SRX controllers was recently changed, the new documentation was vague and difficult to understand. To work around this issue, we experimented with the new API in Eclipse to try to determine its behavior.
Fundraising/Outreach:		

Objectives & Work Done

Build/Design: Inventory and stored new items, capped and countersunk BTM, drilled holes in metal plate, and further worked on BTM.

Cad: Worked on the elevator and added rails and holes from the design

Programming/electric:

Fundraising/Outreach:

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

- Build/Design: BTM will most likely need to be completely redone because it was cut to the wrong length.

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

- We had to learn how to use the tapping tool in order to know how to make threaded holes.

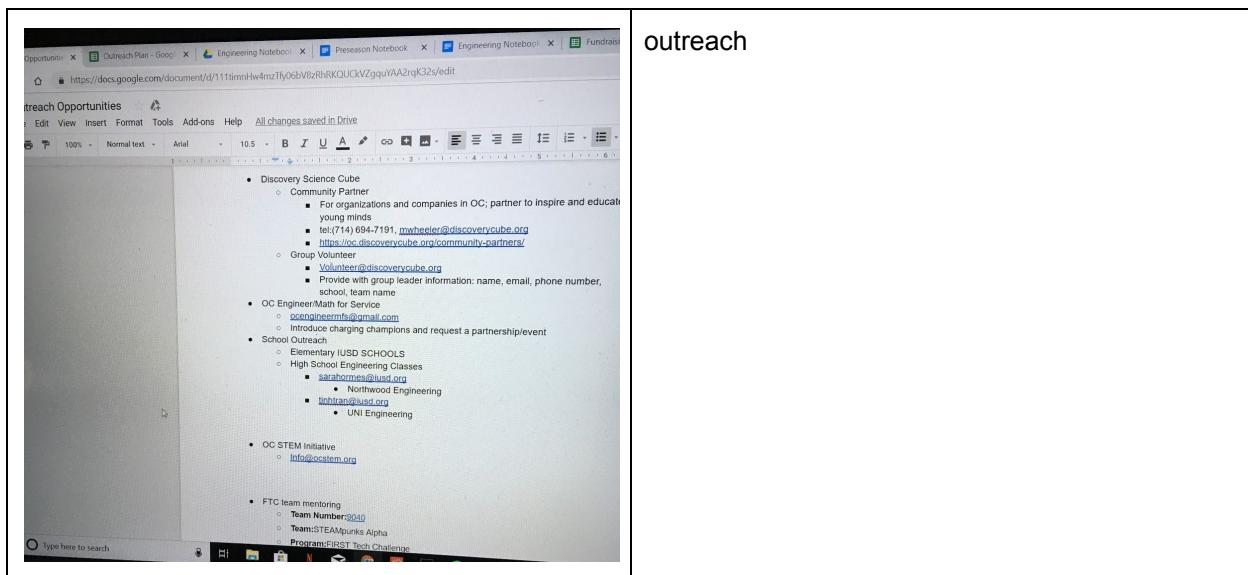
Decisions Made *What progress did we make? What was achieved?*

- We were able to work a lot on the BMT, such as tapping and countersinking them. Progress was also made with inventory, by recording the newly arrived items, and organization, by color coding boxes to either green (mechanic) or red (electronic). Screw box was also further organized.

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

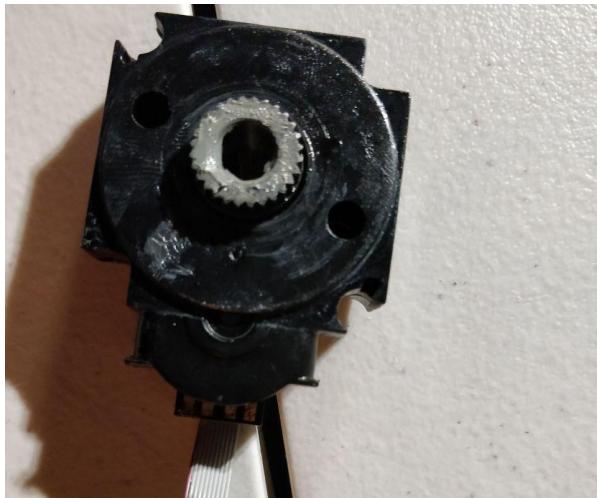
- We learned to double check that our measurements and overall progress are correct before we continue.

Pictures

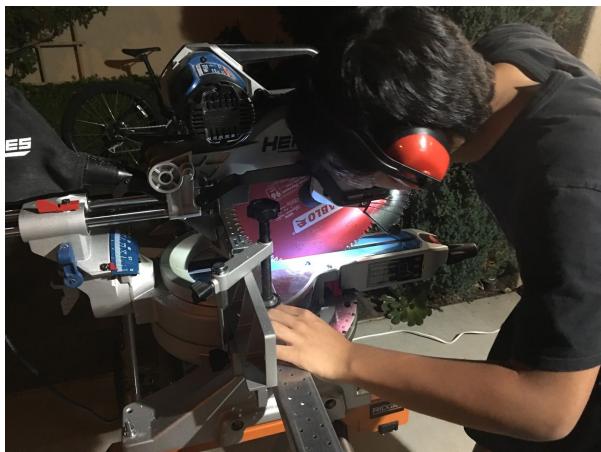




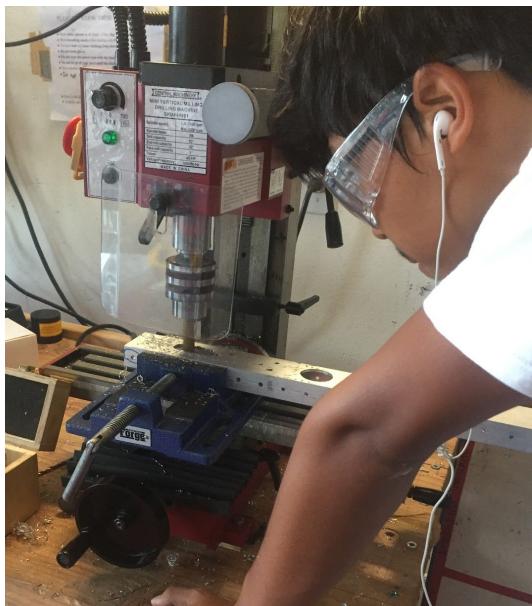
electrical



cad



build



build



Name	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Matching eligible? Y/N
Name	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Matching eligible? Y/N
Rama Nambiaradom																										yes	
Raj Neenvannan																										???	
Seema Patel (aunt)																										YEET	
Zhihong Lin																										No	
Elena Pu																										No	
Michael Kumawati																										no ??	
Yousheng Jia																										No	
Nilesh Shah																										Apple	
Robert Jhoo																										No	
Kale Lo																											
Xiaojin Hu																											
Hamid Ahmadizadeh																											
Jeyvan Nasimeda																											
Djoko Tandiono																											
Nilesh Mehta																											

my brother jeyvan (sony) will donate 1k to us, 500cash to name, and rama (panco) will donate 2000(jevars 500 plus his 1500) to us, panco and sony will give 2k and 1k



Engineering Notebook (11/03/18)

Session: 16

Location: Inside Raj's Garage

Attendance: Rohan, Alicia, Selina, Yiming, Jingwen, Parva, Arjun, Thomas, David, Jack, Adrin, Albert

Mentors/Coaches: Raj, Hamid, Rama

Notetakers: Rohan, Adrin, Thomas

<u>Objectives</u>	<u>Achievements</u>	<u>Issues and Concerns</u>
Build/Design: <ul style="list-style-type: none">• Finish milling the chassis components (tube stock + c-channel)• Finalize BTM modules• Continue work on the gearbox sub-assembly	•	•
Cad: <ul style="list-style-type: none">• Continue work on cad elevator	<ul style="list-style-type: none">• Finished guide rails and carriage	<ul style="list-style-type: none">• Many parts were unavailable online, had to cad parts ourselves

Objectives & Work Done

Build & Design:

-

Cad

- Added guide rails and carriage to cad design

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

- Many of the parts we needed for the elevator were unavailable online so we had to cad them ourselves to be able to add them to the elevator design

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

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

- Guide Rails and Carriage were added to the cad design

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

Pictures

Engineering Notebook (11/04/18)

Session: 17

Location:

Attendance:

Mentors/Coaches:

Notetakers: Parva, Aaron, Jamie, Jaimin

<u>Objectives</u>	<u>Achievements</u>	<u>Issues and Concerns</u>

Objectives & Work Done

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 Notebook (11/09/18)

Session: 18

Location:

Attendance:

Mentors/Coaches:

Notetakers: Aaron, David, Jamie

<u>Objectives</u>	<u>Achievements</u>	<u>Issues and Concerns</u>
CAD <ul style="list-style-type: none">- Update Preaseason CAD model to fit new changes to Belt Tightening Module- Continue Elevator Work- Start Library Work	<ul style="list-style-type: none">- Preaseason Motor Mount updated with new dimensions (thickness different)- Elevator work in progress	<ul style="list-style-type: none">- Software issues with Autodesk Inventor, will need to see how to expand files. Messy organization will need work- Discovered issue with parts ordered not being in tolerance with CAD dimensions- Found build issue where holes were drilled in the wrong locations
Programming <ul style="list-style-type: none">- Worked on finalizing control system diagram- Jack taught the basics of Git and how it works	<ul style="list-style-type: none">- Finished the control system planning	<ul style="list-style-type: none">- Low attendance was unfortunate but the code is pretty much finalized so it wasn't too bad

Objectives & Work Done

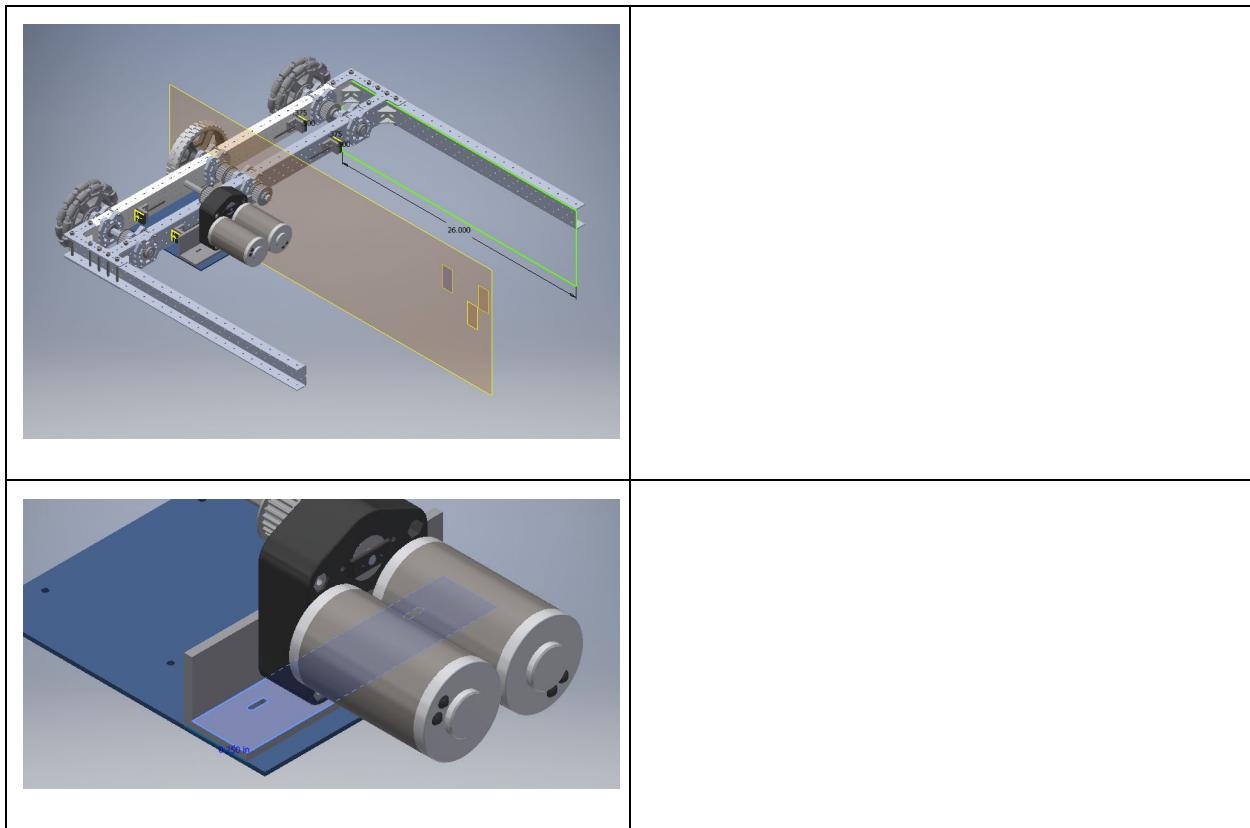
Problems *What problems did we face and how did we solve or attempt to solve these?*

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 Notebook (11/10/18)

Session: 19

Location:

Attendance:

Mentors/Coaches:

Notetakers: Selina

<u>Objectives</u>	<u>Achievements</u>	<u>Issues and Concerns</u>
Build: <ul style="list-style-type: none">•		
Cad: <ul style="list-style-type: none">• Complete the elevator system• Started making a library of pieces• Added encoder parts	•	<ul style="list-style-type: none">• Download speeds were very slow and took up a lot of time

Objectives & Work Done

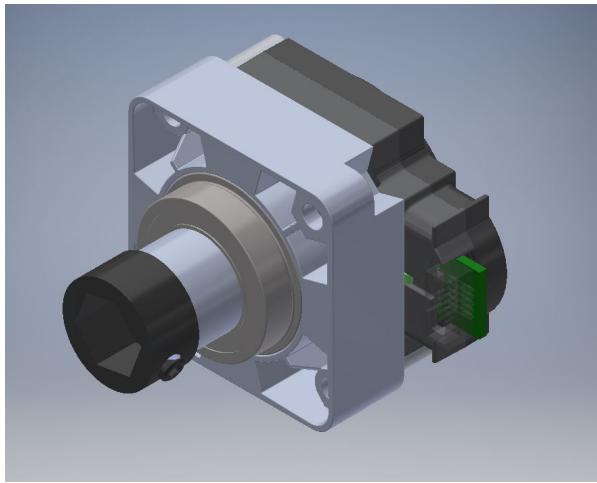
Problems *What problems did we face and how did we solve or attempt to solve these?*

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 Notebook (11/11/2018)

Session: 20

Location: Arjun's garage

Attendance: Parva, Radin, Jamie, Adrin, Albert, David, Jingwen, Maximilian, Jack, Arjun, Selina, Thomas, Krish, Aaron, Yiming, Rohan, Alicia

Mentors/Coaches: Coach Srinivas, Coach Raj, Coach Hamid

Notetakers: Euan, Yiming, Albert

<u>Objectives</u>	<u>Achievements</u>	<u>Issues and Concerns</u>
Build: <ul style="list-style-type: none">Finish chassis (including Belt Tightening Module stuffs)	<ul style="list-style-type: none">Drilled holes on L-Brackets for gearbox holder thingChassis completed (excluding drivetrain)	<ul style="list-style-type: none">Belt tightening module holes are different measurements from the CAD model.Couldn't find 140T belt
CAD <ul style="list-style-type: none">Model the electrical panelComplete the elevator assembly in CAD		
Programming/Electronics: <ul style="list-style-type: none">	<ul style="list-style-type: none">Finished assembly of electrical boardRedid rewiring, length and managementFinished encoder mount	

Objectives & Work Done

- Drilled holes for screws on L-Brackets that holds gearbox.
- Completed chassis (excluding drivetrain)

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

- Belt tightening module holes were different distance apart from the CAD model. We (kinda) fixed this issue by changing the measurements on the CAD model.
- We couldn't find a 140 teeth belt because it was placed in a poor area.

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

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

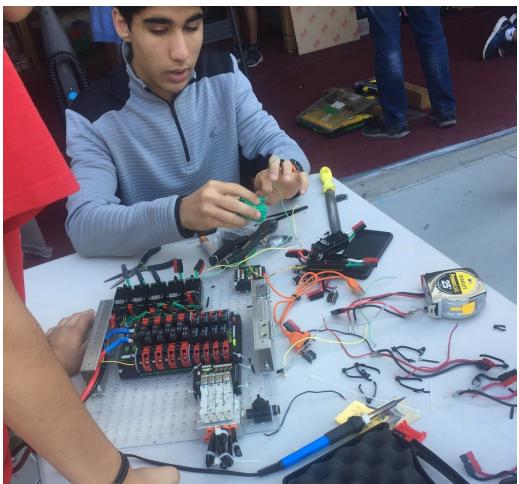
- Drilled holes for screws on L-Brackets that holds gearbox.
- Completed chassis (excluding drivetrain)

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

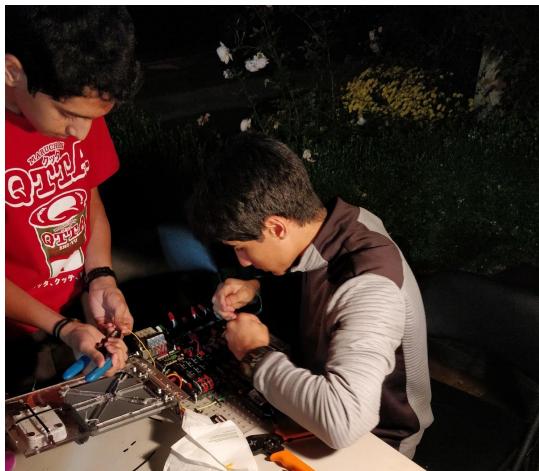
- We learned that we should triple check our measurements and compare them to the CAD model before we make permanent changes.
- We need to put things back to where they belongs so that time isn't wasted for finding missing items.

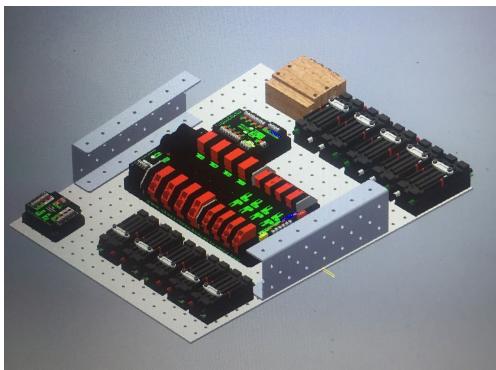
Pictures





Combining all the electrical parts together and fixing the components onto the electrical board





Cad model of electrical board



Engineering Notebook (11/16/2018)

Session: 21

Location: Arjun's Garage

Attendance:

Mentors/Coaches: Coach Hamid, Coach Raj, Coach Rama

Notetakers: Alicia, Jingwen, Jamie, Sriyan

<u>Objectives</u>	<u>Achievements</u>	<u>Issues and Concerns</u>
Outreach <ul style="list-style-type: none">• Work on Chairman's essay/research• Finish follow up with johnson & johnson	<ul style="list-style-type: none">• finished follow up with johnson and johnson• chairmans winner research• constructed viable outreach plan• chairmans essay progress	
CAD: <ul style="list-style-type: none">• examine elevator system to see if it fit all the needed requirements• brainstorm assembly ideas on where to place the elevator system on chassis• organize CAD library	<ul style="list-style-type: none">• a final plan for elevator system placement was agreed upon• CAD library became organized	<ul style="list-style-type: none">• previously worked on CAD model for final design had not been uploaded into drive, and the computer containing that file was not present, resulting in delayed time• miscommunication of final design led to major need of adjusting elevator system and its placement on the chassis
Programming: <ul style="list-style-type: none">• Connected the control system to the web-configuration system and checked all of the connections	<ul style="list-style-type: none">• Realized the problem wasn't with the wires, but with the roborio• Swapping the roborio fixed the problem	<ul style="list-style-type: none">• One out of the two robrios we have does not work at all• We should be good for now as long as we have at least one working one
Build <ul style="list-style-type: none">• Work on the gearboxes and belt-tightening module		

Objectives & Work Done

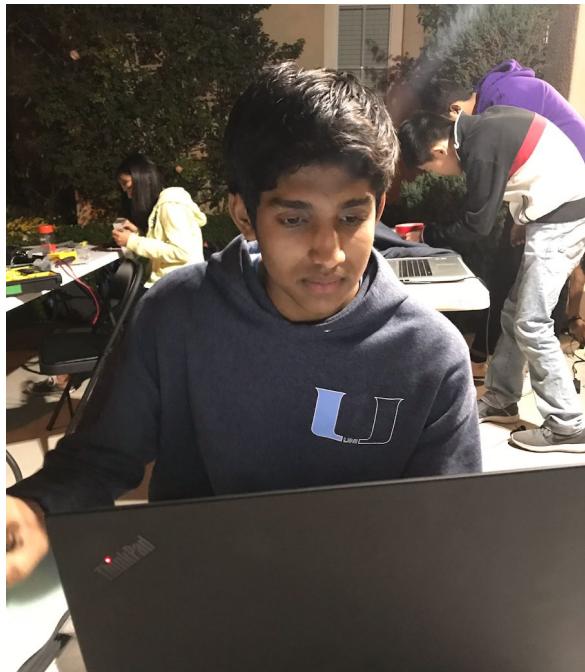
Problems *What problems did we face and how did we solve or attempt to solve these?*

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

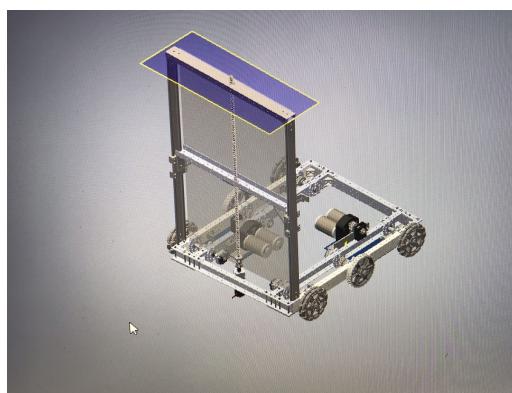
Decisions Made *What progress did we make? What was achieved?*

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

Pictures



Cadding the elevator



Decided on placement of the elevator on the chassis

Engineering Notebook (11/17/2018)

Session: 22

Location: The Garage

Attendance: Krish, Selina, Alicia, Rohan, Aaron, Yiming, Arjun, David Jingwen, Adrin, Radin

Mentors/Coaches:

Notetakers: Rohan, Parva

<u>Objectives</u>	<u>Achievements</u>	<u>Issues and Concerns</u>
Build: <ul style="list-style-type: none">• Build Gearbox Tightening Module• Attach GTM and gearbox plate to chassis	<ul style="list-style-type: none">• Constructed GTM• Attached to Chassis• Linked up all belts• Attached motors as well	<ul style="list-style-type: none">• Some holes were made wrong, wasting time to re-drill them.
CAD: <ul style="list-style-type: none">• Finish elevator designs• Figure out how to attach battery to chassis	<ul style="list-style-type: none">• Fixed all errors in elevator and attached it to chassis• Crafted a design to attach battery to chassis using plexiglass	

Objectives & Work Done

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

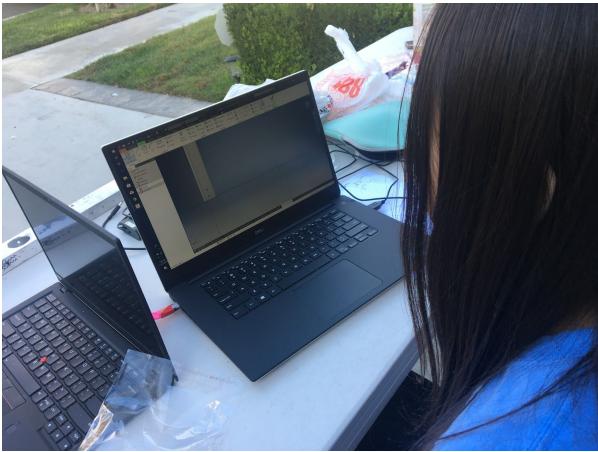
When making the Gearbox Tightening Module, some of the holes were marked wrong or had been previously drilled wrong, so they had to be fixed.

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 Notebook (11/18/18)

Session: 23

Location: Arjun's Garage

Attendance: Adrin, Jamie, Alicia, Albert, Jingwen, Rohan, Yiming, Thomas, Radin, Sriyan, Jaimin

Mentors/Coaches: Coach Raj, Coach Hamid

Notetakers: Yiming, Jingwen

Objectives	Achievements	Issues and Concerns
Build: 1. Determine orientation of battery and mount onto robot 2. Design bumpers and fix the dimensions of last year's robot 3. Fix electrical board onto robot	<ul style="list-style-type: none">Discussed ways to mount electrical board, secure the battery, and assemble the bumpersPlan to have 2 u-like 1x1 bars and mount the electrical board on top of it; these bars will also hold the battery in place; we started building this	<ul style="list-style-type: none">Bumper error as we didn't cut the c-channels long enough to account for the bumper plate so we need to fix the cad model for season
CAD 1. Design the mount for the battery and assemble it in Inventor 2. Design the bumpers and their mounts; assemble in CAD 3. Decide a location and assemble electrical board on robot	<ul style="list-style-type: none">Good progress on CAD for bumpers and battery holder	<ul style="list-style-type: none">CAD model is a little different from actual bumpers because 1) the length of the real bumpers are different and 2) the real chassis' c-channels are not as long as they should've been
Programming 1.		

Objectives & Work Done

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

- Upon starting the bumpers, the concern was raised that there are no supports on the corners as the c-channel doesn't extend past the wheels, so we need to come up with a solution to add a stable support
- There was also the problem of the electrical board being too big to fit anywhere in the chassis. We spent a lot of time brainstorming what the most efficient way of placing the electrical board would be.
-

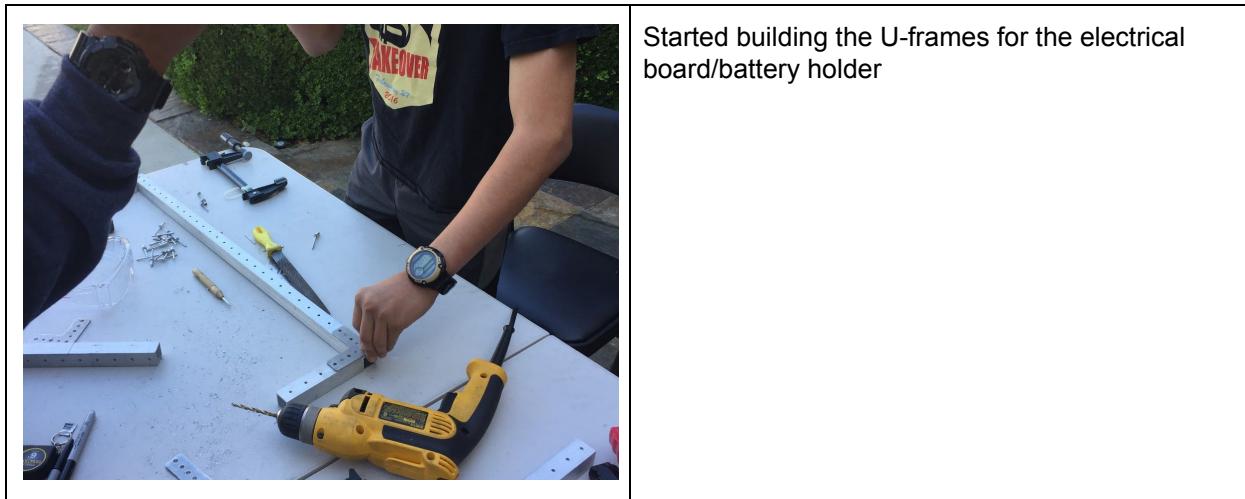
Research *What did we have to learn about in order to move forward?*

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

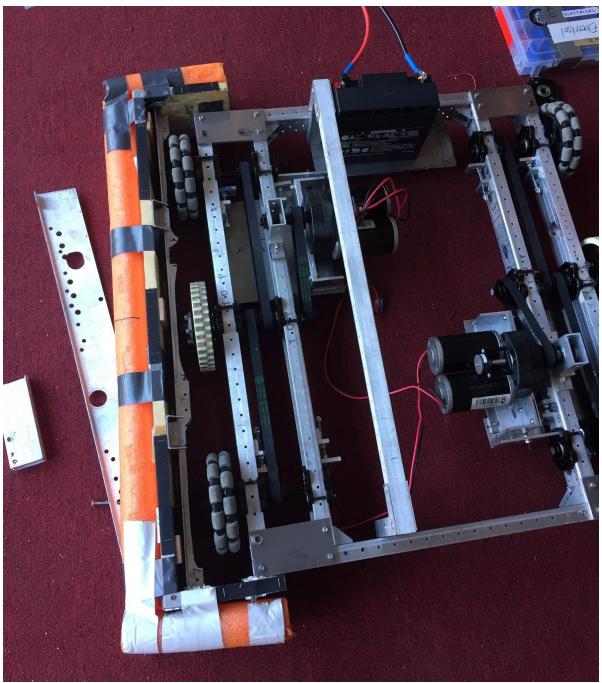
- We decided to use metal bars for both the electrical board and the battery holder for the most efficiency.

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

Pictures

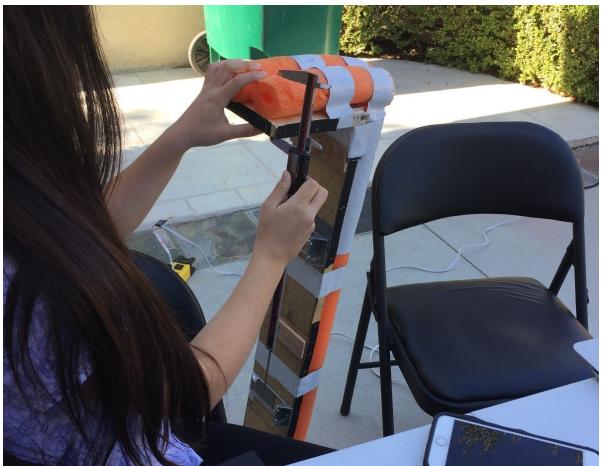


Started building the U-frames for the electrical board/battery holder

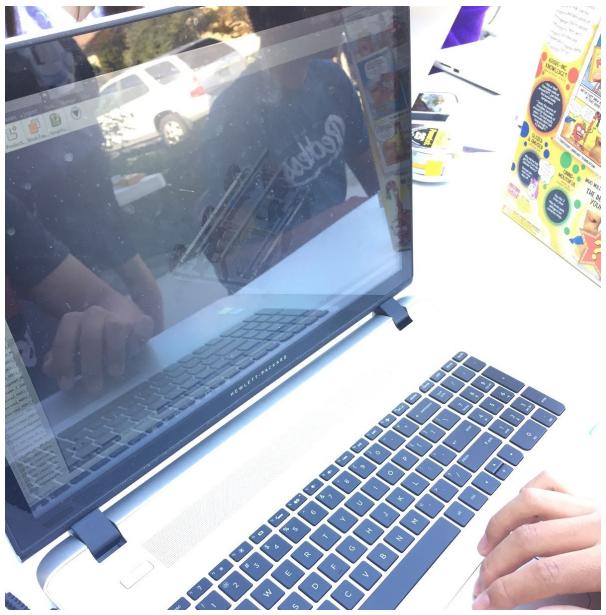


Because we are re-using last year's bumpers, the length is a little too long for our pre-season chassis so we added wooden spacers to the side to make it more secure.

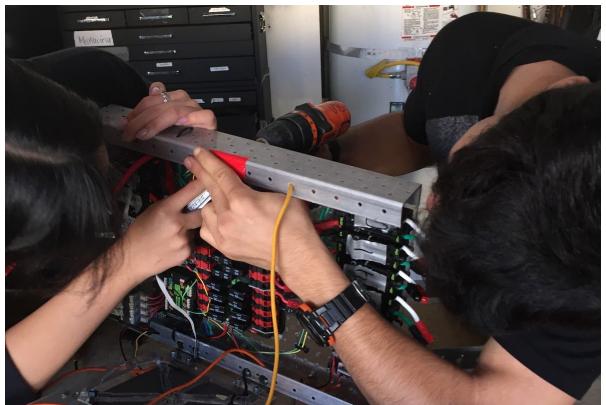
We also started making the second story of the robot for the electrical board, which also doubles as a battery holder.



Started cadding the bumper model



Cadding the electrical board base/battery holder



Made last few changes to the electrical board and it's ready to be put on the robot!

Engineering Notebook (11/20/18-11/21/18)

Session: 24

Location:

Attendance: Jingwen, Parva, Thomas, Yiming, Euan, Rohan

Mentors/Coaches: Coach Raj

Notetakers: Jingwen

<u>Objectives</u>	<u>Achievements</u>	<u>Issues and Concerns</u>
Build: <ul style="list-style-type: none">• Fix the middle wheel assemblies to the metal itself, not the versahub, for more stability• Bumpers• Fix loose screws• Tighten all the belts and put the chassis back together	<ul style="list-style-type: none">• Attached hooks onto bumpers• Cut the 3" metal bars for the bumpers• Removed/replaced broken screws on the robot• Re-attached and retightened all the pulleys and belts	<ul style="list-style-type: none">• Some of the screws were jammed and had to be sawed off, which used up a lot of time, especially since some of the screws were in hard-to-reach places
CAD: <ul style="list-style-type: none">• Cad bumpers	<ul style="list-style-type: none">• Finished cadding bumpers and assembled onto main robot• Finished making the bumper hook	<ul style="list-style-type: none">• When we finished the CAD model for the bumpers, we realized that the metal bar segments in between the chassis

Objectives & Work Done

Yes

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

- A few of the corner screws were jammed because we didn't use the right nut. To solve this, we sawed them off with a hacksaw.

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

- Looked up the game manual for bumpers to make sure that we were complying with all the required rules

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

- It was decided that the bumper segments would be fixed to the chassis, instead of just being bound to the chassis by screws because if we went with the original plan, the screws would absorb all the energy when the chassis hits something and the threads would break.
- Decided to position the bumper bars and hooks on different parts of the plate so that they would not interfere with each other
- Decided to order 0.125" sheet metal for the bumper plates

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

- If a locknut can't make at least 2 revolutions around the screw, it's too small. Next time, make sure that the nut matches the screw or else it will get jammed if we try to force it in.

Pictures

No pics yet cuz I forgot

Engineering Notebook (11/24/18)

Session: 26

Location: Arjun's Garage

Attendance: Alicia, Arjun, Thomas, Rohan, Yiming, Aaron, Krish, Parva, Jaimin, Jingwen

Mentors/Coaches: Coach Raj

Notetakers: Jingwen, Jaimin, Parva, Rohan

Objectives	Achievements	Issues and Concerns
Build: <ul style="list-style-type: none">• Work on bumpers<ul style="list-style-type: none">◦ Cut sheet metal◦ Drill holes in sheet metal and chassis◦ Find screws (either put on procurements or we can use existing ones)◦ Attach bumpers	<ul style="list-style-type: none">• Cut sheet metal and drilled holes	<ul style="list-style-type: none">• Sheet metal not ordered so we are using a smaller thickness temporarily and it is slightly flimsy• Didn't take into account the fact that the sheet metal is longer than the actual robot so the hole measurements are inaccurate
CAD		
F&O <ul style="list-style-type: none">• Finish Chairman's Short Answers	<p>Finished rough draft of every question Revised most questions Outlined Essay</p>	We are over the character limit
Programming/Electrical: <ul style="list-style-type: none">• Assemble and attach encoders• Finish battery mount/attach circuit breaker to chassis	<ul style="list-style-type: none">• Finished all objectives	

Objectives & Work Done

- For the bumpers, we first finished screwing in the hooks to the actual bumpers.
- with the thinner sheet metal, we cut out bumper plates, and then we marked where all the bumper parts would go, including the small bar segments, screws, and rivet nuts
- we also tightened all the belts using the belt tightening module.
- For electrical, we assembled the encoders onto the wheel assembly, and then drilled holes and screwed in the circuit breaker.

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

- Build: For the bumpers, we didn't order the sheet metal from last week so we are using different sheet metal as a temporary substitute.

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



Finding screws to screw the circuit breaker onto the chassis



Practicing cad



Tightening belt module



Assembling encoders

Engineering Notebook (11/25/18)

Session: 26

Location: Arjun's Garage

Attendance: Yiming, Albert, Alicia, Thomas, David, Rohan, Jingwen

Mentors/Coaches: Coach Raj, Coach Rama

Notetakers: Jingwen, David, Yiming

Objectives	Achievements	Issues and Concerns
Build: <ul style="list-style-type: none">• Finish bumpers<ul style="list-style-type: none">◦ Drill holes into the bumper plate and the chassis◦ Attach rivet nuts◦ Attach L-brackets• Fix drivetrain• Attach encoders to drivetrain	<ul style="list-style-type: none">• Able to make proper repairs to drivetrain before additional testing would take place• Made a mock PoC of bumper module with scrap sheet metal, did not attach support L-brackets yet• Encoders properly attached on	<ul style="list-style-type: none">• Screws of the bearing blocks were placed on wrong side• Bearing blocks are not lined up• Some blocks didn't have spacers or didn't have the right amount of spacers• Bumper plates were not ordered so actual bumper was not fabricated
CAD <ul style="list-style-type: none">• Work on elevator• Finalized bumper module model	<ul style="list-style-type: none">• Finished third rendition of elevator model• Made two versions of bumper (one with screw/nut fastening and one with draw-latch fastening)	
Programming/Electrical: <ul style="list-style-type: none">• Wire up encoder	<ul style="list-style-type: none">• Cut out needed length of ribbon cable, attached connector onto cable, connected encoder to motor controller	

Objectives & Work Done

- Finish rough model of bumper with scrap metal
 - Drilled holes for rivet nuts into chassis, attached rivet nuts and mounted prototype bumper plate as PoC
- Fix all remaining issues with drivetrain before any real testing (wireless) and autonomous testing occur
 - Finalized drivetrain fixes for the foreseeable future
- Finalize attachment of encoders onto drive shafts
 - Accomplished goal with some slight modifications to encoder mount

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

- Build:
 - For the bumpers, we didn't order the sheet metal from last week so we are using different sheet metal as a temporary substitute.

- Discovered multiple errors in assembly of the drivetrain: bearings placed incorrectly, spacer allocation in c-channel was incorrect

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

- Build:
 - Looked online to research specs of slide-snap draw latches in order to incorporate into second version of bumper design
- Programming & Electrical:
 - Looked up more effective method of adding connectors to ribbon cable

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

- Decided to make two models on CAD for bumper module to explore different fastening options

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

- Need to reinforce standard build practices and rules (ex: Bearings are placed inside to out in bearing blocks, orientate screws for bearing blocks towards easiest access point to make adjustments easier, design base chassis with modifications for easier access to tightening modules and other fasteners)

Pictures

Engineering Notebook (11/30/18)

Session: 27

Location: Arjun's Garage

Attendance: Yiming, Max, Selena, Alicia, Albert, Rohan, Thomas

Mentors/Coaches: Coach Raj

Notetakers: Alicia and Selina

<u>Objectives</u>	<u>Achievements</u>	<u>Issues and Concerns</u>
Build <ul style="list-style-type: none"> ● Attach noodles onto bumpers ● Trying to cut L-Brackets for mounting on the bumpers 	<ul style="list-style-type: none"> ● Attached the noodles ● Created the L-Brackets 	<ul style="list-style-type: none"> ● There was an accident with the miter saw

CAD:	<ul style="list-style-type: none"> • on hold for today 	

Objectives & Work Done

- Finished attaching the noodles on to the bumpers
- Finished creating the L-Brackets.

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

The miter saw blade was chipped, so it hindered our progress.

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

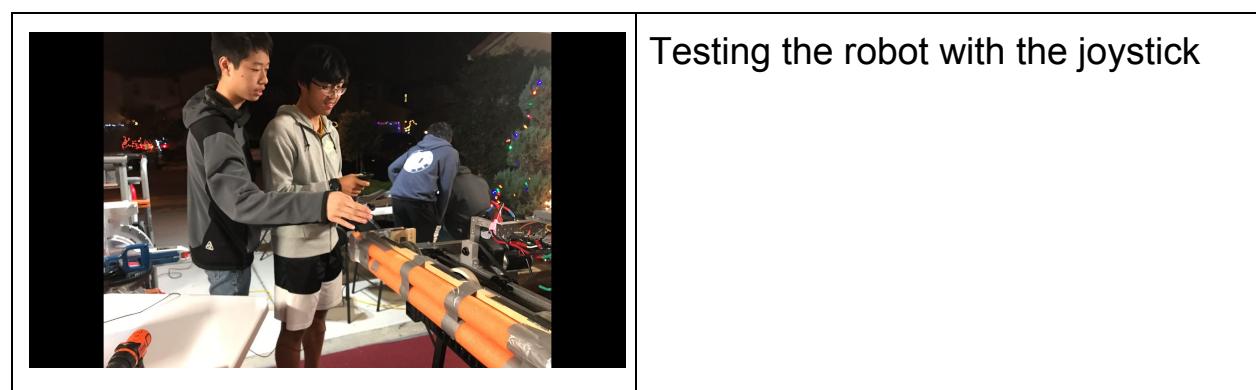
We already had all background context.

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?*

- We learned that it was necessary to have everything on the miter saw tightly secured.

Pictures





Attaching noodles on to the bumpers



Working on the autonomous

Engineering Notebook (12/01/18-12/02/18)

Session: 28-29

Location:

Attendance:

Mentors/Coaches:

Notetakers:

<u>Objectives</u>	<u>Achievements</u>	<u>Issues and Concerns</u>

Objectives & Work Done

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 Notebook (12/7/2018)

Session: 30

Location: Arjun's Garage

Attendance: Yiming, Rohan, Thomas, Parva, Euan, Jamie, Adrin, Jack

Mentors/Coaches: Coach Raj

Notetakers: David, Adrin

<u>Objectives</u>	<u>Achievements</u>	<u>Issues and Concerns</u>
Build <ul style="list-style-type: none">•	•	•
CAD: <ul style="list-style-type: none">• w		

Objectives & Work Done

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 Notebook (12/08/18)

Session: 31

Location:

Attendance:

Mentors/Coaches:

Notetakers: David, Aaron, Jamie, Sriyan

<u>Objectives</u>	<u>Achievements</u>	<u>Issues and Concerns</u>
- Finish the Elevator in CAD - Adjust CAD model - chassis	- Restarted the elevator - Working on it	- Discovered massive flaw with current elevator system, remade the elevator system -

Objectives & Work Done

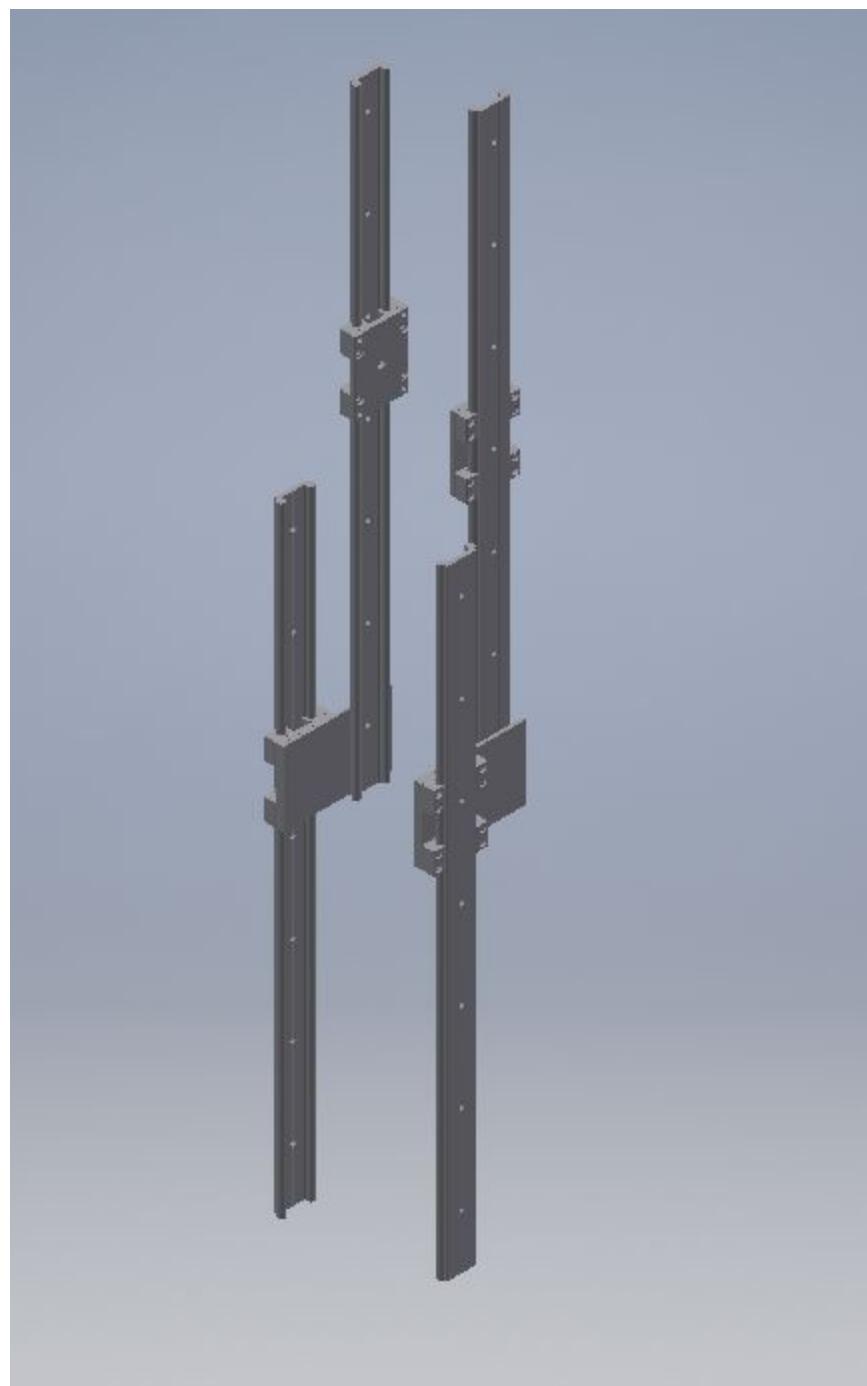
Problems *What problems did we face and how did we solve or attempt to solve these?*

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

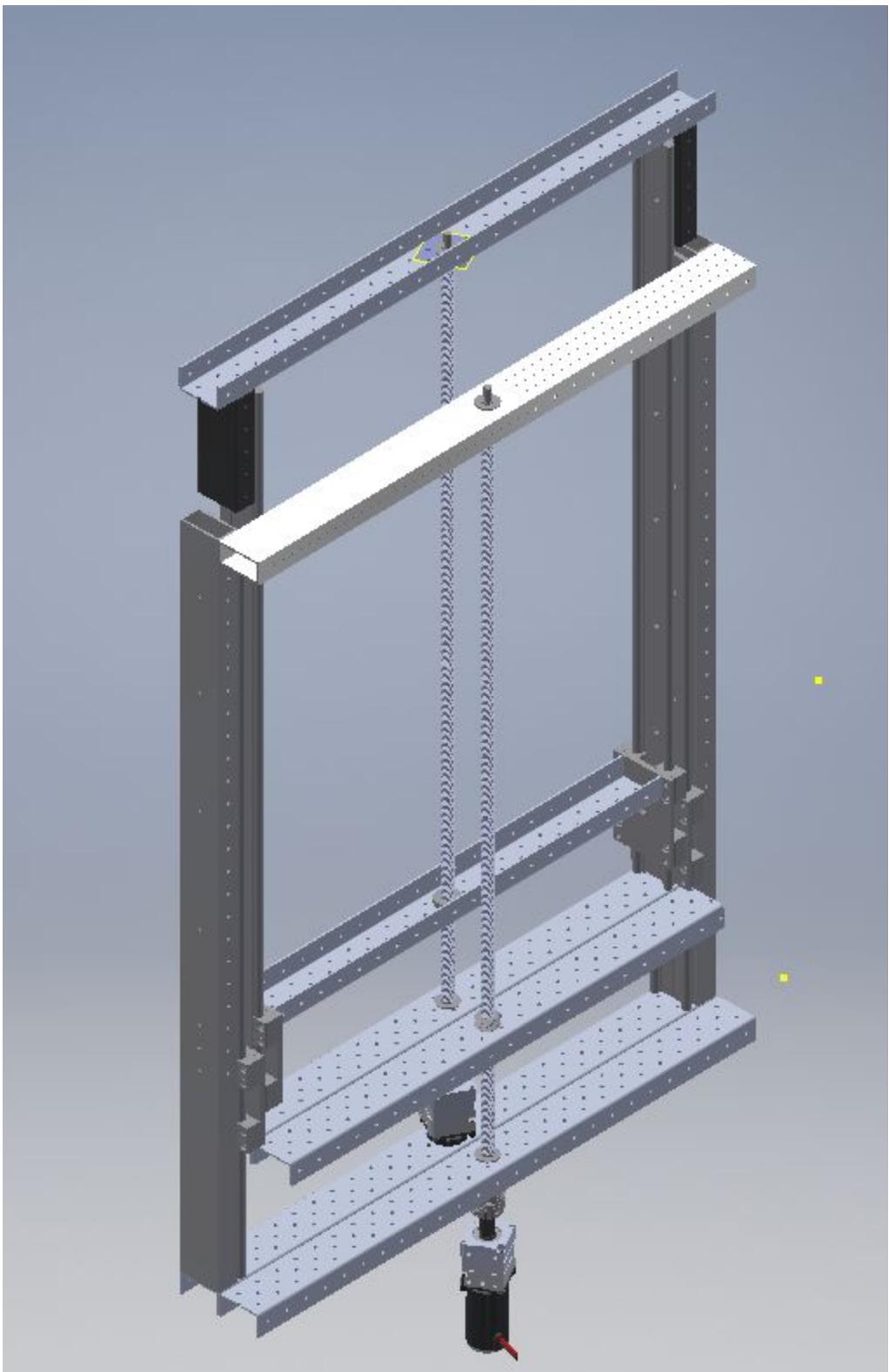
Decisions Made *What progress did we make? What was achieved?*

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

Pictures







Engineering Notebook (12/09/18)

Session: 32

Location: The garage

Attendance: arjun, david, euan, yiming, parva, sriyan, alicia, selina, aaron, jaimin, jingwen, uhh?

Mentors/Coaches: Coach Raj, Coach Srinivas

Notetakers: Jingwen

<u>Objectives</u>	<u>Achievements</u>	<u>Issues and Concerns</u>
Build: <ul style="list-style-type: none">• Cut L-brackets for BTM• BoM• Take inventory on screws and design a screw-sorting system	I'm working on it	
CAD:		
F&O: <ul style="list-style-type: none">• Work on chairman's award		
Programming:		

Objectives & Work Done

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

