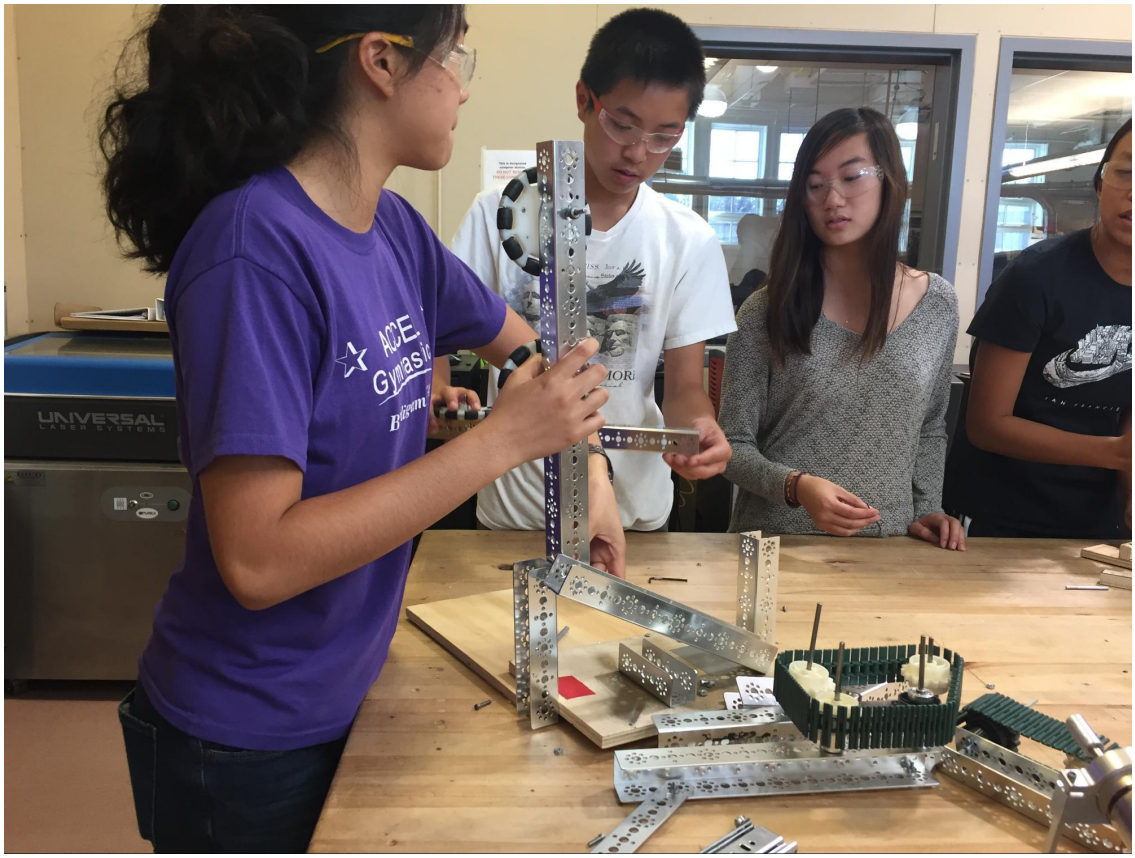
FTC Daily Engineering Log

2017-2018 Season

Date	Blogger	What did we do today? (changes to the robot, making mechanisms and its progress, design challenge, etc.)	Personal thoughts (team progress, team dynamic, breakthroughs/setbacks, something you learned, interesting/fun things that happened, etc.)
11/6/17	Jacob McConnell	Today, multiple groups made headway in their design challenge of making a catapult. The drive team, while being observed by the mentors, kept on fixing problems with the robot for the competition in 13 days. The people working on the robot added more mecanum wheels to the intake and they worked on a phone mount.	I think that the team is working together well in groups and is making good progress in achieving our goals for completing the robot.



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11/7/17	Logan Noworolski	Today we had to move our stuff out of the room we used for the last few years of robotics. This was because we no longer will have access to this room. Some people helped move and disassemble things (last year's FTC field). The drive team put on and tested the new mecanum wheels we have. These wheels make our strafing, speed, and turning much faster than before. Also the extra wheels on the intake makes it jam less but go up slower. During the late part of the meeting we started a new challenge that includes programming and engineering. The challenge is to sort Jelly Beans in good and bad colors. We get to choose the good versus bad beans. As a result the team bonds and have a better understanding for designing and splitting up work.	I think that the team has bonded already. They have been collaborating a lot on the new challenge bringing others together. Also the drive team has gotten much better than earlier today at driving with the new wheels.

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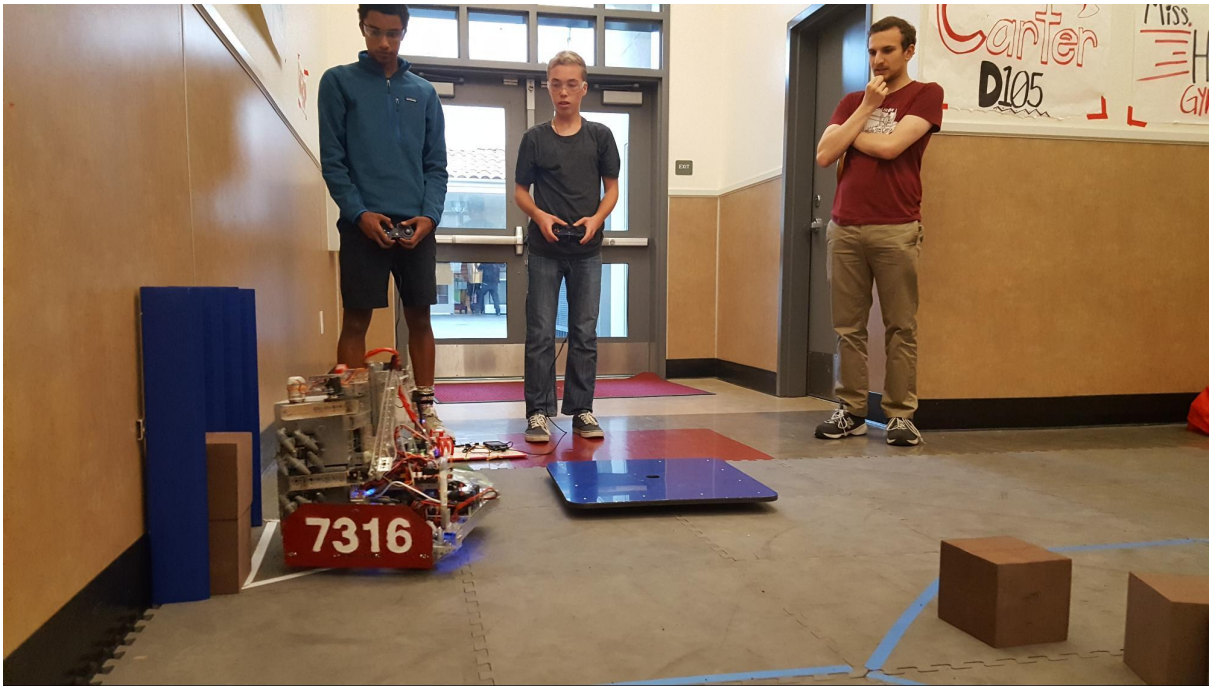
11/8/17	Aristotle Marangu	Today we improved the stability of our mecanum wheels by double supporting them. Darrion and Hubert used some of our tetrix pieces to make double support them. The color sensor was also placed back on our robot today. We had taken it off of the robot to test it, and found that it works, so we now placed it back. Also, we worked on driver practice. Yesterday, we cut down our time of the cryptobox in the end, and now, we are working on making our time improvements more consistent.	I liked what we were able to achieve today, and it was definitely a successful day. I am hoping that we will be able to cut down our cycle times even more before our competition in 11 days though. I had a lot of fun driving around today, and am looking forward to cutting down our time even more!



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11/13/17	Christopher Yu	For today's meeting, our robotics team worked on multiple projects. One project required us to identify the colors between multiple jelly beans and pick up the targeted ones for a delicious treat. Our mentor, Mark, who devised this challenge wanted to push his to think outside the box and ultimately have fun. Our design for catapults were also concurring with the jelly bean challenge. Jacob and myself both finished designing our own catapult, but after testing it, we realized that it hooked the projectile downwards a bit. Lastly, the drive team for our engineering team worked with finalizing the robot, which was pretty much successful save for the necessary driving practice that was used for programming the robot to function well for the autonomous section of our competition. Looking forward, our plan envisions a great push for a flawless glyph mechanism for the upcoming Saratoga meet.	I really liked that we were all working on a variety of different things instead of having the majority of the team work on the robot when they only need the drive team.

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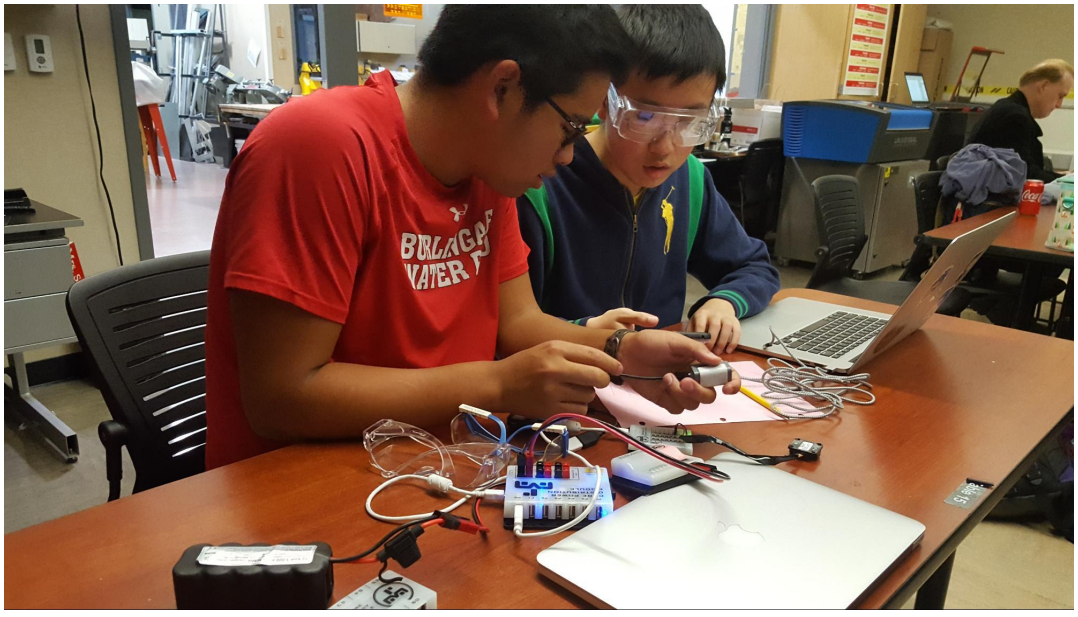
11/14/17	Wayne Flores	For today's meeting, the drive team continued to do even more drive practice while the rest of the engineering team continued to work on the jellybean challenge. Jerry collaborated with the main team's lead software programmer, Adam, to plan and make the autonomous. Meanwhile, I worked on the engineering notebook and appointed some of the engineers to create sketches of the robot's main mechanisms, the intake, jewel arm, and the (potential) relic arm. I also wrote some descriptions of the mechanisms for the design section of our notebook. Later, some of our mentors did a mock pit judging session where they asked us questions that judges would most likely ask us during competition.	I'm feeling really good about the current state of the drive team and the robot. It's looking like the drive team can consistently do a full cryptobox and I think we have a solid chance at doing very well during the Saratoga Competition. I'm also really close to finishing the entire engineering notebook which has been really fun to design.



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11/15/17	Nicole Louie	For today, our drive team continued to practice their ingame timing along with practicing the robot's autonomous act. The engineers made some adjustments to the robot by adding a sensor converter and lock-tited the wheel hubs. We also worked on a new relic arm using one servo connected to two polycarb claws which grabs the relic from the side instead of from the above. As for the design challenge, each team is at a different stage of their process. While some are still working on their code for the servos and the color sensors, some teams finalized their jelly bean sorter. Because one team had not-so-involved engineers, they made their mechanism out of paper and tape. Jasmine and I decided to help the group by building their base and connecting polycarb to their servo.	I am enjoying taking a break from the robot by working on the jellybean project. I am also really excited for their upcoming competition at Saratoga and aiding our drive team with the pressure of a real audience.

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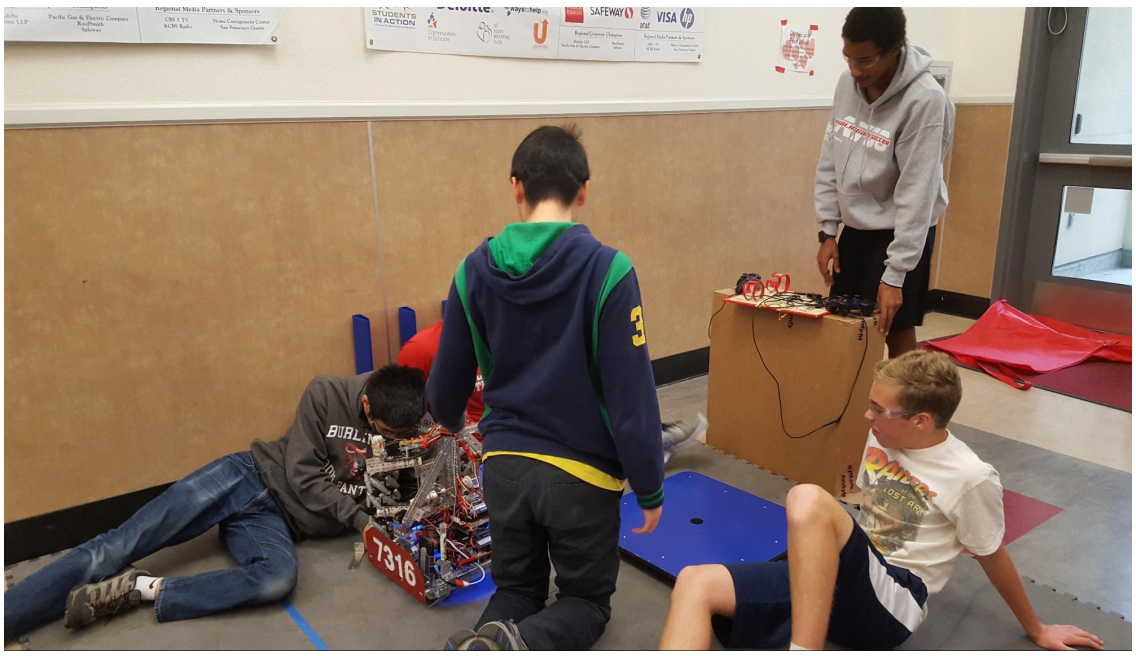
11/16/17	Hubert Chen	During our meeting today, we were unable to have any drive practice for our two drivers because a chain from the drive base fell off of the sprocket. We found that this was due to a loose motor mount which could not be tightened. To solve this problem a piece of metal was placed next to the motor to help keep it in place. Afterwards, the programmers spent some time testing their autonomous code. A few of the engineers began working on attaching a rail to the lift in order to help stabilize it. Due to the programmers working on autonomous, they were unable to complete it. The other engineers continued to work on the jelly bean sorting challenge.	I felt like today that today was a bit slow compared to the other days, although we still made some progress on our robot.



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11/17/17	Aaron Becker	Today, we started off the day strong with a mock-up of judging that we will experience in the competition on Sunday. Some FRC members listened to us and gave us feedback on how we presented ourselves. While the bulk of FTC was working on the judging, programmers Jerry and Adam, who was helping out, were working on auto PID. Doing this involved many repetitions of trying to get the robot to drive a consistent amount of inches, and tweaking PID constants slightly. Eventually, they tweaked the constants until the robot was moving pretty consistently, and then they tried incorporating a route. Unfortunately, this broke the code but I'm sure that they will get it working tomorrow!	I think that the programmers have done a great job getting auto working in such a short time! I also think that judging went pretty well for our second time in front of mock judges. 

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11/27/17	Sydney Woo	The qualifying tournament that our team participated in showed us that we needed to focus more on drive practice. One of the problems that were identified was lack of practice with other robots. Our team noticed that we had trouble navigating around our alliance partner and opponents. For today, the team split up into our different assigned roles, whether they be drive practice, working on the relic arm, building a defense/outreach drive base or programming. By the end of today's meeting, the drive base was completed and is ready for programming and some new relic arm ideas were developed. However, in the middle of the meeting, one of the chains attached to the servo came off and had to fixed. The team is awaiting the news.	I think that it is so important that the drivers get to practice a lot with the robot. I was part of the group that needed to build the drive base, we wanted to finish as soon as possible to use it during our upcoming outreach event at Hillsborough (November 30) and the Burlingame Tree Lighting Ceremony (December 1). I learned how to attach wheels and motors to the drive base today. Although we were missing shaft collars, we were able to find some still attached to wheels that were not being used. This was a valuable lesson in creating robots.

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11/28/17	Darrion Chen	Today the programmer continued working on the auto and tuning PID so that the robot can travel distances accurately. A team was also dispatched to fix the disconnection issues with the Modern Robotics color sensor. The group decided to completely replace the color sensor with an Adafruit sensor and a custom wiring set. The issue of disconnection was traced to a faulty logic level converter. Meanwhile, engineers continued to work on the design for relic scoring mechanism, and also continued to work on the catapult design challenges. Some financial issues were worked out. Planning on the Burlingame-hosted scrimmage started.	I had a nice day today. I think the team did too.

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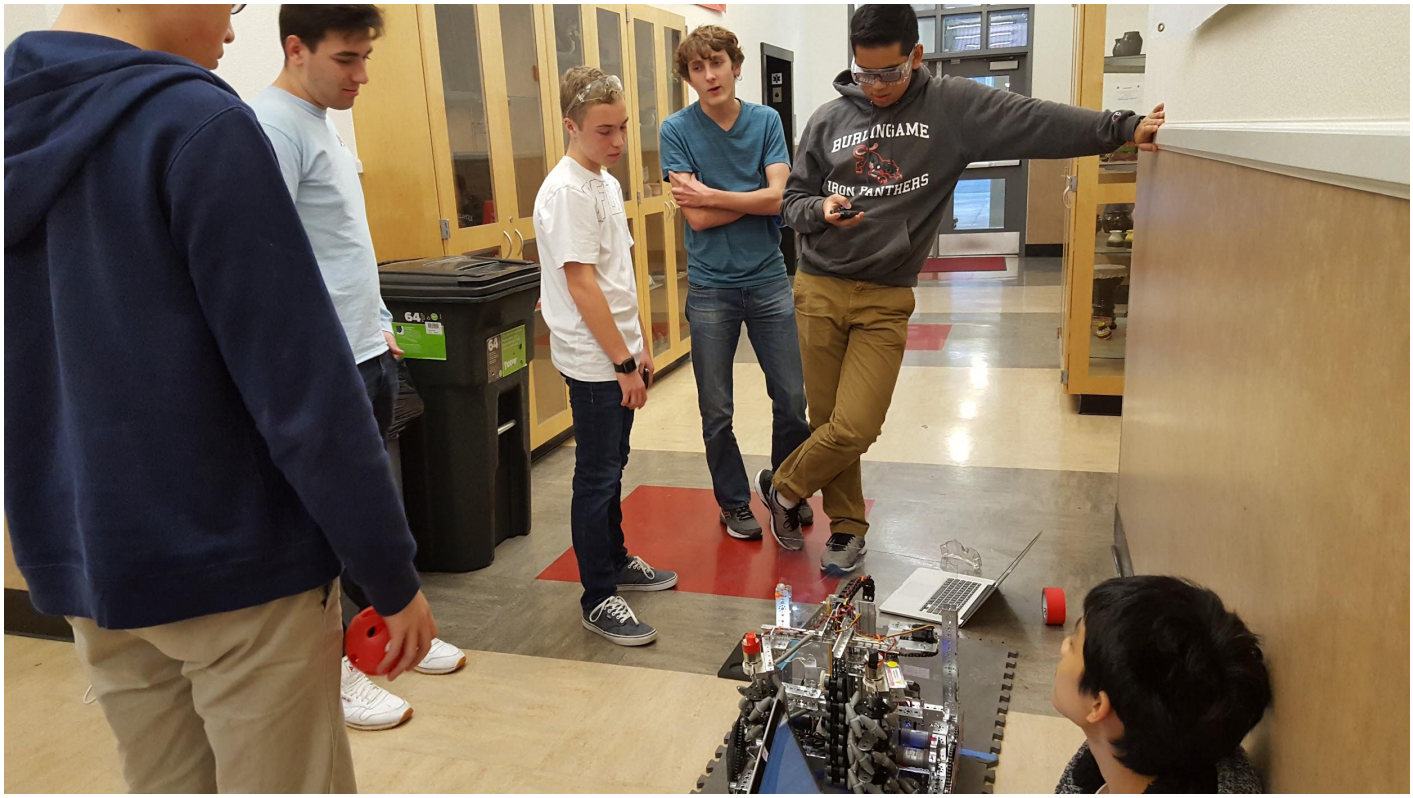
11/29/17	Jasmine Ang	Today programming continues working on auto because it is not working the way we want it to. Hubert and Chris worked on the relic arm, while everyone else on the team was assigned in pairs. Each pair was instructed to create a peg as a practice engineering challenge for FRC. Everyone was racing to find materials because materials were limited.	Today was a good day and everyone was productive. I learned that if you are last to get to the storage room, it becomes really hard to find suitable materials.



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12/4/17	Cherilyn Yu	Today, most of our team worked on the peg from the FRC field set-up of last year. Making the peg would help us get used to the instructions for making the FRC field during the new season. Most of the teams were able to attach the two bases on the main board and add the triangular sides. Hubert and Chris also continued to work on the relic arm for our robot. They replaced the wheels on the linear slide and began to add rope for the linear slide. Programmers continued to work on the autonomous for our robot.	I think our team got lots of things done today. We worked well and efficiently and we all had a good time doing it.

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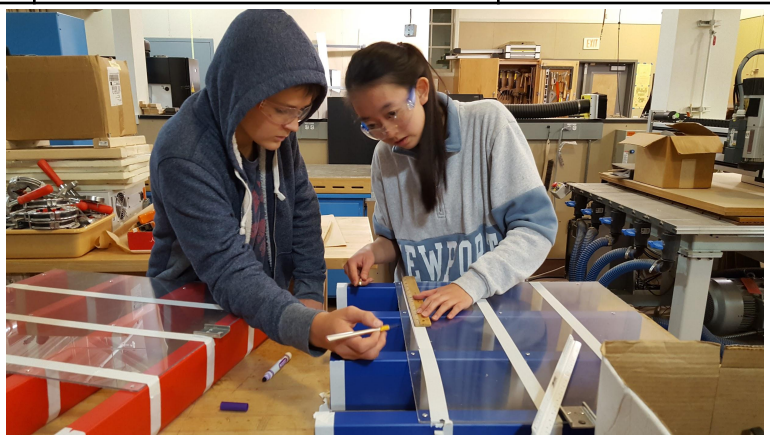
12/5/17	Carrie Lei	Many things were able to be accomplished during our meeting today. In the beginning of the meeting, the groups finished building their pegs as practice for building further FRC objects. The pegs were then disassembled so that the materials could be reused for different activities. For the rest of the meeting, we spent time putting together field objects for our upcoming tournament this Saturday. We built balancing stones and cryptoboxes in preparation for the competition. Meanwhile, Jerry continued to progress on the code for auto and worked on the code for the robot overall. Towards the end of meeting, groups that worked on the Jellybean Challenge presented their prototypes and explained their design process to our mentors. Lastly, the FTC team started to read the FRC 2016 game manual in order to learn how to build a shooter for our next design challenge.	Overall, I feel that although the team may have been starting to feel stressed out with upcoming school events and tests, we were all definitely feeling excited for the upcoming competition. It was fun to be able to build game objects and see objects for the field slowly come together. One setback however was that while we were using the rivet gun to attach the balancing stone together, the rivet gun became jammed, and it was a setback to because we were stopped from being able to further assemble the stones. Still, I think the team had a fun and interesting day.



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12/6/17	Logan Noworolski	Today we officially started our new design challenge. This was to make a shooter from the FRC challenge, “Stronghold”. People split into groups and began designing shooters. Our programmer, Jerry practiced auto.	I think that a new challenge will take the teams stress away for our host because it will give them something to do. I also think that doing a project on a FRC competition is good as it will prepare them for the FRC season.

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12/8/17	Aristotle Marangu	Today, we added a stronger servo to the moving side of our intake. This seemingly small change made a huge difference because our other servo was not gripping the glyphs much when the linear slide was raised, so they would often fall out. Also, there was not enough pressure from the mecanum wheels before so the glyphs had trouble going up our intake, but the stronger servo solved that.	I am happy about this change because as driver b, it was hard to intake glyphs before and sometimes took up to 5 seconds more, so this is really helpful for me. I think that this can definitely help us cut down our cryptobox time, so I am excited to test it out soon! One challenge we faced was that the current servo had a connector with 25 teeth, but the new one had 24 teeth, so it wouldn't fit. We solved this by finding a piece that fit on 24 teeth instead of 25 and now it works.

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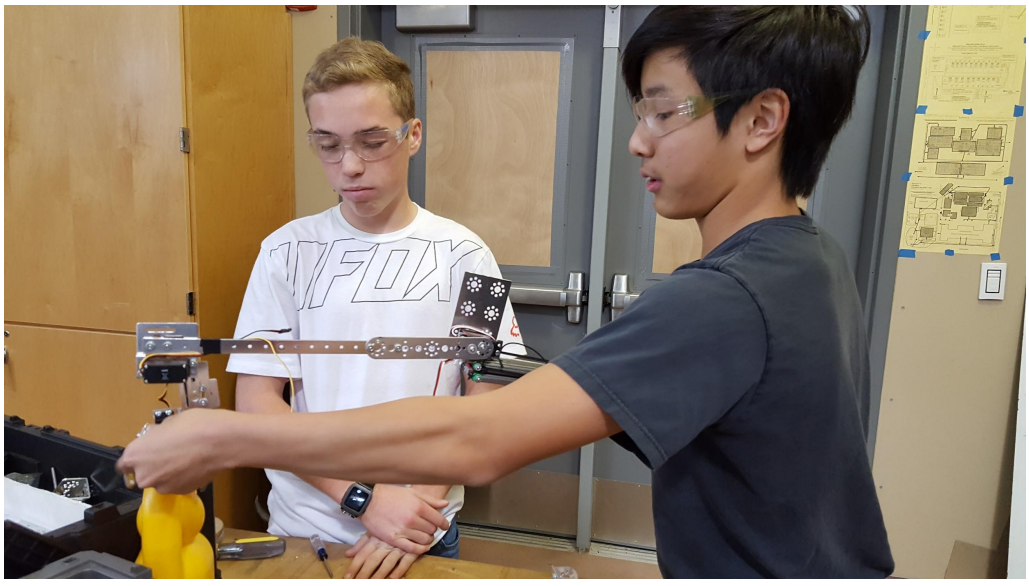
12/11/17	Aaron Becker	Today, we started off a little bit slow because we had fewer members. It's the week before finals, so several of us were not in the lab. Once we got started, Hubert started working on the Relic again, and I cleaned up and taped some cables at the top of the intake. Once I was finished, Darrion and Jerry tried to run the robot tethered to a computer, to test the relic design manually. For some reason, it didn't connect, and Jerry decided to take the robot to do some work on vision processing for auto. Hubert and I (pictured below) then started working on a new relic design, which uses two polycarb bent pieces to pick up the relic. This lets us pick it up much more quickly, and we will continue working on it tomorrow. I hope that the new design is effective!	I think that the new relic design is very effective and it works well, and I'm excited to see how it progresses in the last part of build season and going into winter break!



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1/9/18	Jasmine Ang	Today, several different projects were being done. Nicole and I were in charge of attaching the relic arm. We had to make several adjustments to ensure that the relic arm did not exceed past the robot size restrictions. Our drivers did not have as much time to do drive practice this meeting because other members of the team needed to make changes to the robot. However, they were still able to practice for about an hour towards the end of the meeting. Our programmer, Jerry, worked on auto. A few of our members joined FRC teams to work on prototyping.	Today was a very productive meeting. Everyone was hard at work with their separate projects. Our team had a fun bonding trip when we had to go out to buy dinner for late meeting. Overall, it was a good day.

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1/11/18	Christopher Yu	Our robotics team was pretty split up today's meeting. Part of our team worked on the relic arm by testing it and improving on its current mechanical abilities. Some other members, including myself, on the other hand helped our brother team, who are competing in the FRC challenge. Multiple of our members were then split further into separate aspects, Intake, Scale, Switch, Climb, as well as even building a wooden representation of the portal for the new robot we were prototyping.	Over this year, all of us have spent lots of hours, effort, and patience with building our robots. We have learned multiple basic teachings, and we continue to learn past that through trial and error. It is great that we have so many mentors and expert students who have a lot of experience to share with others. Ultimately, without strong bonds with each other, I feel we can truly empower ourselves to do better as not only individuals but as unique, spirited, official robotics team of Burlingame High School.

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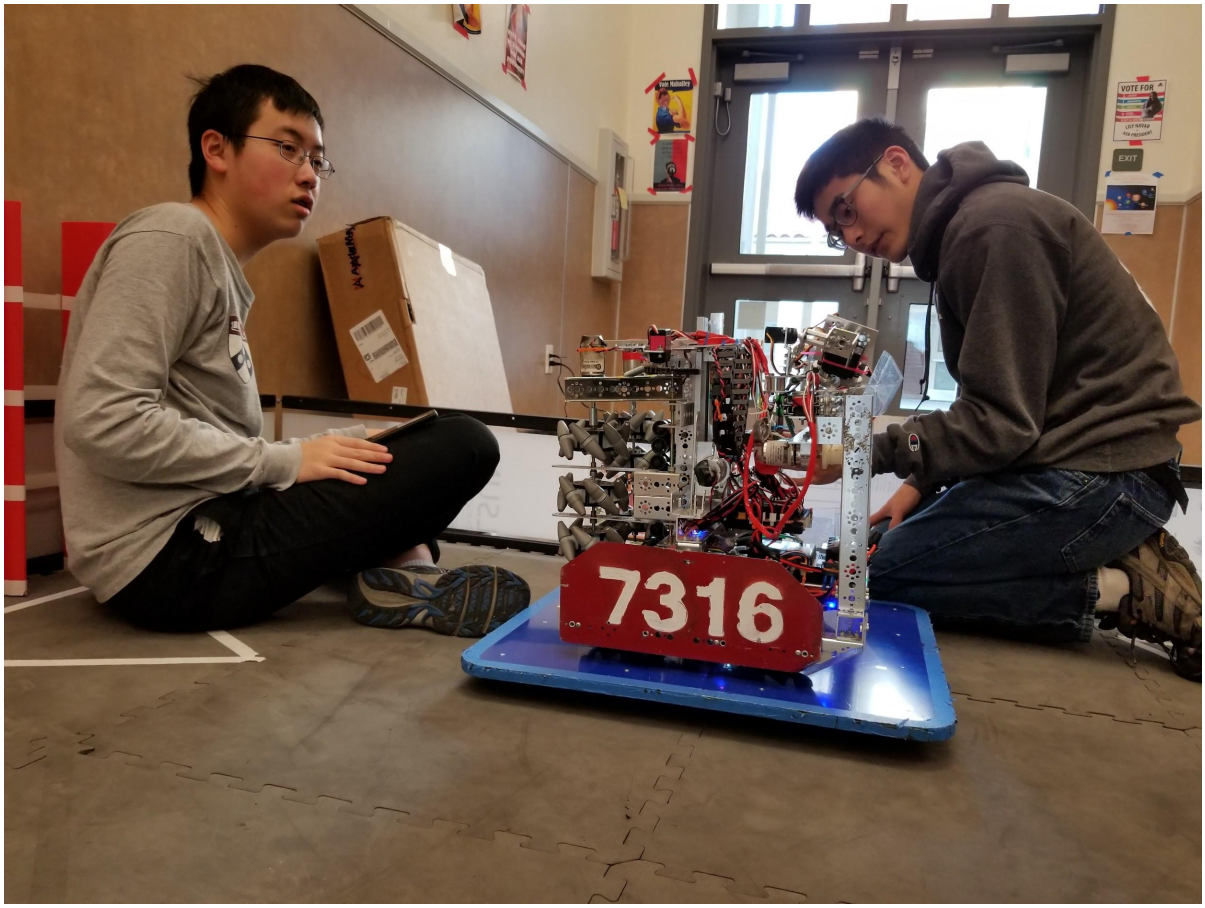
1/12/18	Jerry Yan	The entire day was focussed on polishing the autonomous sequences, primarily PID tuning the gyro turns. In its current state, the turning was slower than we desired and unstable, especially when turning from negative angles. It's still an ongoing problem and requires further testing, but I suspect it's just an error with the math in PID calculations.	The problems encountered with autonomous testing continues to be an obstacle with making progress on the autonomous sequences as a whole, since that function is vital to making the sequences work. As always, PID tuning is a huge time sink and really painful to do.



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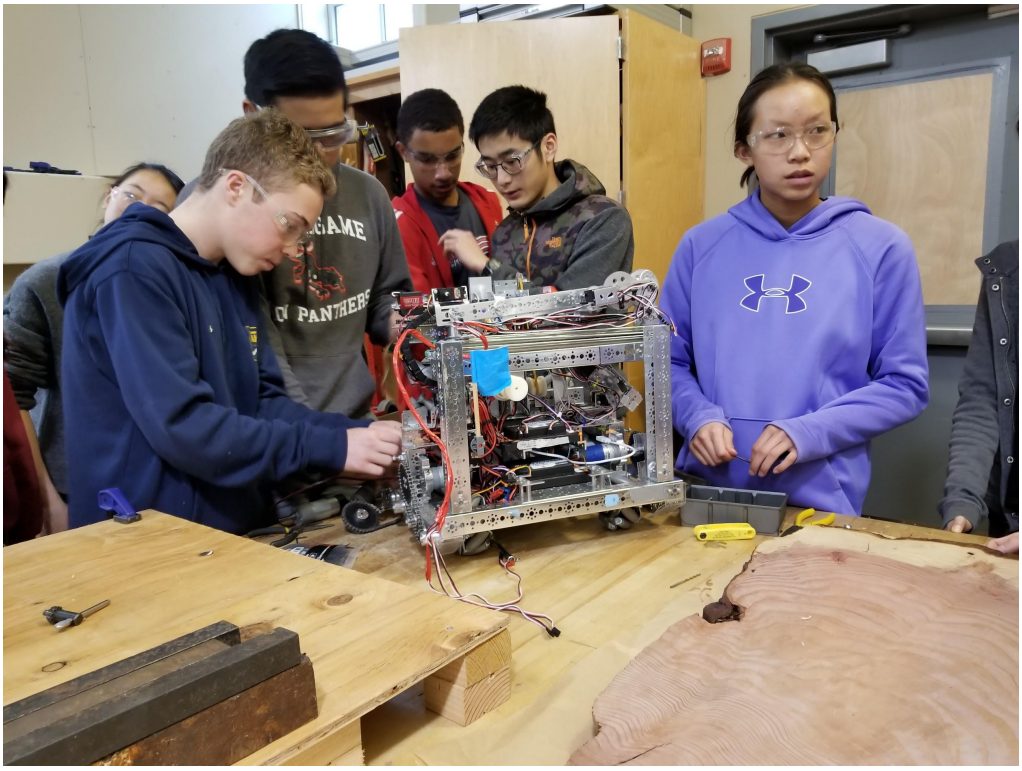
1/16/18	Nicole Louie	Today, our drivers practiced for almost 6 hours. We also assembled our two 3d printed mecanum wheels together and attached them to the robot. Some of us members started working on relic arm by taking the whole thing apart. We decided to keep the same idea, which is grasping the relic around the lower body. Our gears were loose so we rebuilt the grabber so the gears tightly fit and were not as loose. Jasmine and I learned how to CAD using the Solidworks program and are now designing participation plaques for our upcoming scrimmage.	Rebuilding our arm was definitely a set back, but I think we can quickly build one. Learning how to CAD was also interesting, a lot of little quirks that we had to learn around in the program and annoying at times.



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1/18/18	Hubert Chen	Today the drivers and programmers had robot priority and spent their time practicing and working on auto. However, since the relic arm is quite heavy, it would change the center of mass and mess up our PID turning once we put it on. To combat this problem we zip tied a weight to the side of our robot. We made lots of progress on our relic arm. We successfully converted the linear slides from continuous to cascade and we are now using chain and sprockets to move the arm. We also finished the “elbow” of the arm which is powered by one cr servo geared 2 to 1. However, this was still not strong enough so we added bungee cords to help the arm. We then attached the grabber which we completed also. The product is complete but we are yet to test it due to programmers being to busy.	I think we did good. We used the glyphs as dining tables during dinner. It is unknown whether any were damaged. The new 3d printed mecanum wheels greatly improve the intake as seen today.

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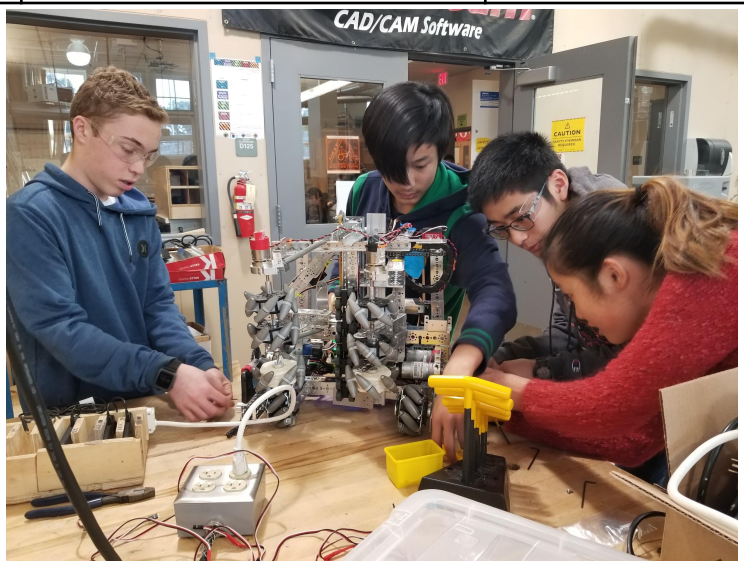
1/19/18	Sydney Woo	Today, the team changed the sprockets from plastic to metal to try to reinforce the strength. However, once tested, the chains fell off. As a result, we switched back to the plastic ones. Carrie, the new driver did a few practice runs with the plastic sprockets. They come very close to a consistent cipher. Programmers worked on auto as well to prepare for the competition and the scrimmage that will be held tomorrow. The scrimmage will be hosted by our team and takes place at the San Mateo Event Center in the Sequoia Hall. We hope to see about 6-7 teams show up. The purpose is to practice on a full field and against other teams. Our relic arm is complete, but we have yet to put it on the robot. A metal is zip tied to the robot for now as a weight simulation for the drivers and the programmers.	The meeting ended at 5:30 and I think the team worked collaboratively at the end to move all of the needed materials into cars for the scrimmage. I'm excited to see how the scrimmage goes tomorrow.



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1/29/18	Carrie Lei	Today we worked on the grabber that would then be placed beneath the robot to allow it to park more efficiently. It hooks onto the side of the balancing stone when the robot drives onto it. In addition, some of the members of the team helped with the FRC robot by creating designs for an intake and building bumpers for the side of the robot.	Overall, the team was pretty productive and everyone had something to contribute to either the FTC or FRC team. It was a fun day!

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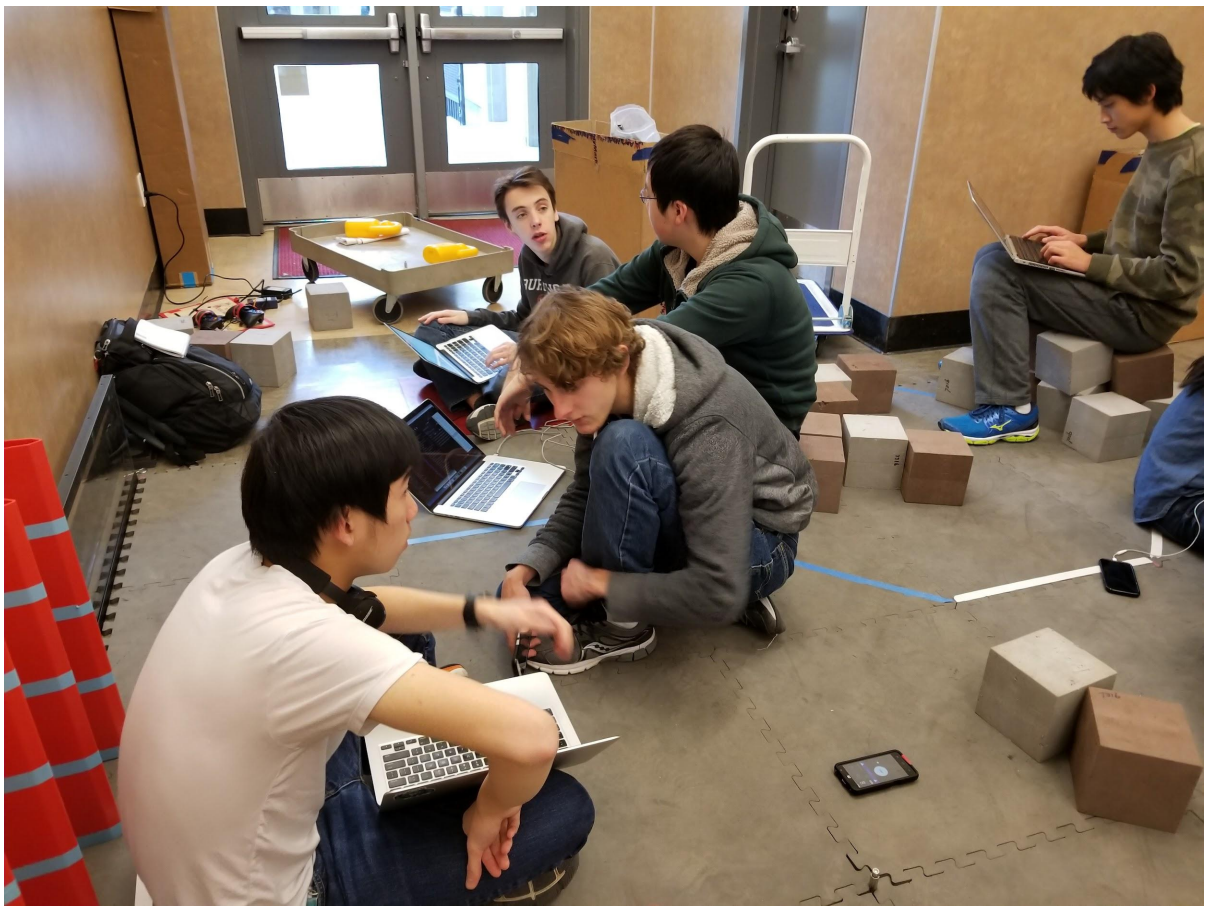
1/30/18	Darrion Chen	No physical changes to the robot. However, very much auto tuning and drive practice. Cemented and finalized all auto. Driver practice, cryptobox record time decreased to 1:08. Also, for fun, completed a cryptobox while entire drive team was planking	Team members floundering with the tailhook idea. Seems like it will break through though.



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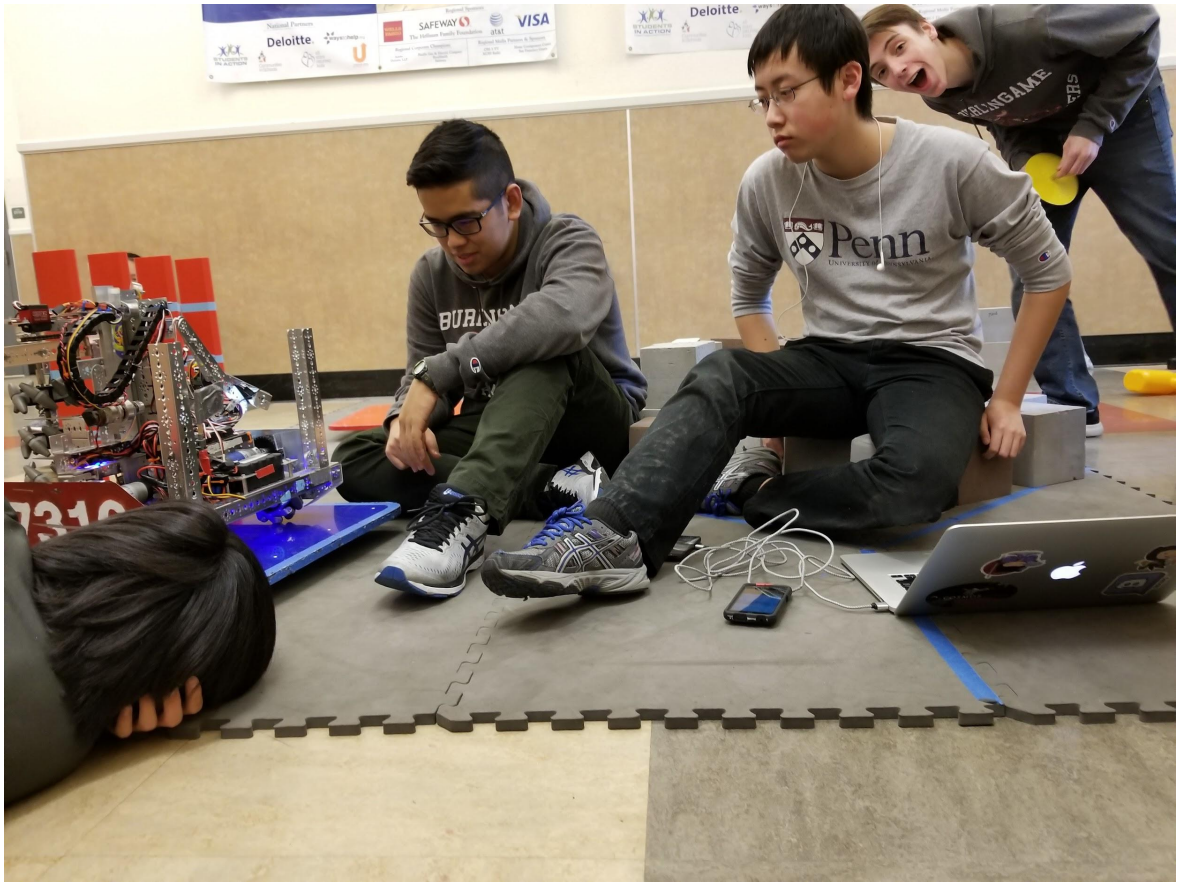
2/1/18	Wayne Flores	A majority of this meeting was dedicated to programming auto. As always, it is a very frustrating and repetitive process but it is worth all of the hard work. Some of the other members were also working on making improvements to the relic arm that we will eventually add on to the robot. During dinner, we had a mock judging session where we practiced some of the topics that we plan on discussing at our upcoming competition.	The team was very productive and we are making a lot of progres. We are all very excited and nervous for the Daly City Qualifier, but we have high hopes in succeeding.



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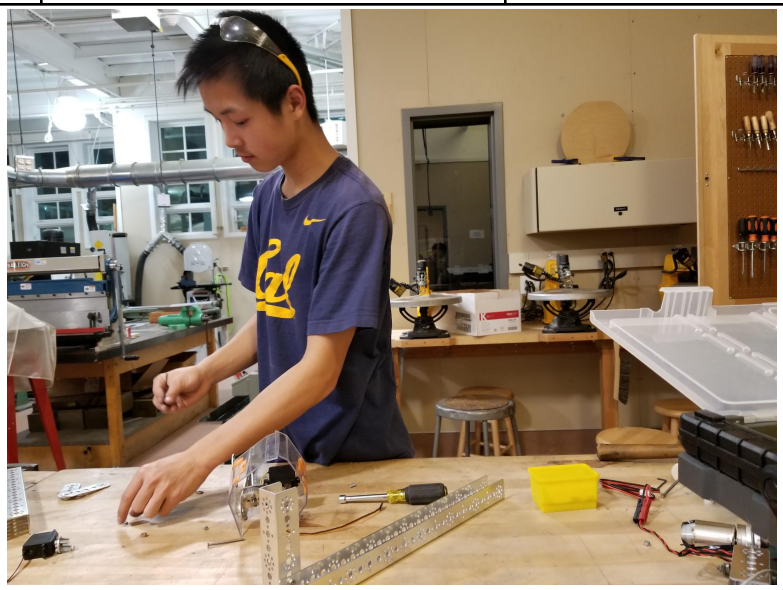
2/8/18	Jasmine Ang	Today, the team split up to tackle different tasks. Sydney, Nicole, and I worked on the tail-hook, a mechanism that is meant to guarantee balancing at the end of the game. At first, the hook was too long and failed 9 out of 11 times. We noticed that the hook extended too far out and the angle was not ideal. We adjusted these two things and tried again. This time, the hook was too short. Nicole and I adjusted the hook and fixed spacing issues. We tried it again and it was successful every try. It was an exciting time. Hubert and Ari are working on the relic arm. They are making improvements to make it lighter. Jerry continued to work on auto and Wayne is reformatting the entire engineering notebook because he wants to make it easier to expand in the future.	I was happy with today's meeting because of all the improvements made. The tail hook is a really cool addition that I know will benefit the team greatly and will help Aaron improve balancing efficiency.



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2/13/18	Chris Yu	On Tuesday, many of us were working on our exciting new projects. Hubert improved the relic arm mechanism by adjusting the grip of the relic arm. I on the meantime was working on a mechanism to lift up glyphs while our mecanum wheels were running to potentially speed up the time necessary for intaking. Other people worked on spray painting plates for the robot while Nicole and Jasmine fixed an inconsistently working tailhook. At the same time, our drivers were strategizing, and our programmer was working on multi-glyph auto.	Today was such a great efficient day. Some setbacks for us however was that there was little organized planning, and I honestly feel we could of done more. Lots of people did not have much to do despite our successes today. Nonetheless, we are very close to being fully ready for Champs this weekend and I believe we have a good chance to advance.

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2/15/18	Aristotle Marangu	Today, we tested our newly mounted relic arm! We mounted it on Wednesday, but made improvements to it and today we tested it for the first time. On our first try, we were able to place the relic standing in the third mat, which is crazy. We also decided that we are going to make an extra relic arm and an extra tail hook so that if one of them breaks in competition, we can mount another one and use it in the next match. One problem we encountered was that the gears on the relic arm skipped teeth, so we decided to go with two servos instead. We also had our programmer work on multi-glyph auto. It seems to be coming together, and hopefully we will be able to pull it off by norcal champs.	As a driver and someone who worked a lot on our relic arm, I am super excited that our relic arm worked so soon. We weren't even sure whether it would move, but it was able to pick up the relic, and even place it on the third mat. I can't wait to have more practice with the relic arm, and I hope that we can use it during norcal champs.

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2/22/18	Sydney Woo	Today, the team installed a piece of polycarb to the left of the bearings on the back of the intake. The polycarb's function is to guarantee the fact that glyphs will not get jammed while moving vertically in the intake. Prototypes were also built to improve the relic design. Holes were also drilled into the side plates to keep them from tilting outwards. After dinner, four tiles were brought in the lab to test the new design and it was found that glyphs intaked beautifully and quickly. However, they also found out that the mecanum wheels were gripping the glyphs too hard. Also, the tailhook on the back of the robot was tested by bringing a balancing stone into lab and repeatedly driving onto it. During the competition, our team noticed that the tailhook was only deployed once.	For the longest time, the team has had problems with intaking glyphs. I'm am very happy that we have finally found a solution to the problem. During judging, we learned that we needed to tell a better story while explaining our design and mechanisms.

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2/27/18	Aaron Becker	Today we made more progress on auto, driving, and relic. To begin, we made many changes to the relic arm today, including changing the servo to a stronger servo, connecting it to our new Servo Power Module, and finally testing designs. We changed the design of the two grabbers to a new, metal claw, which allows the relic to be grabbed more easily and holds it tighter than before, with the help of the strong servo. All of these changes helped increase our reliability, which will increase our efficiency in competition. In addition, transitioning to driving we also made some improvements in efficiency there. One key change that we made is to strafe less, which speeds up our time since strafing is slower than normal driving. Also, we practiced getting the relic and doing ciphers, and although we didn't time it, I am pretty confident that we were averaging about 20 seconds per relic, which is good. Finally, in terms of auto improvements, the programmers were working on a new algorithm using OpenCV to detect the cryptobox, which will allow the auto to align better in autonomous. Lastly, functionality for multithreading was added, which might speed up execution of commands.	Today was a good day in terms of progress and organization (we organized the toolbox and part of the paint room, which is being used for storage). I am happy that we were able to accomplish all of this in a short time. I am also excited for new possibilities with the relic arm!