



MINI-URBAN CHALLENGE

FTC Engineering Notebook

2014-2015

By: Michael Attanasio, Eric Liu, Andrew Rojas



Los Altos Academy of Engineering 1 (LAAE 1)

Executive Summary

Our team is comprised of three veterans who have competed in the Mini Urban Challenge for three years. Our team, Los Altos Academy of Engineering, has taken a step in the right direction every year and improved, however we have not achieved our goal of reaching nationals yet. With the introduction of the new EV3 kit, we have had the challenge of working with new Legos and having to adjust our code. Furthermore, with the addition of head to head robots in the competition, we have had to alter our code and discover a way to detect other incoming robots. During this process, we faced many problems such as competing with a team consisting of a mere three members. Next, we also carry the responsibility of mentoring a second rookie team representing the Los Altos Academy of Engineering.

This year we attempted to try and build a robot with as many capabilities as possible, some of which include the addition of more sensors as well as adding the ability for the robot to extend its sensors. To account for other robots in the head to head match, we included a sonar sensor to detect robots approaching our robot. In addition, the extending color sensors will allow us to read the differentiation in colors and sense the parking space. Aside from technical problems, we had to adapt to the rules. Initially we expected the Bluetooth implementation into the competition and we began researching. However, that feature was soon taken out, so our team had to be very versatile in adapting to changes. Competing in the competition with only three people has also been tough. We do not have the man power most teams have and we are forced to be more efficient workers. This has also helped us improved as individuals because it has become necessary to carry on more responsibilities than normal.

The objective of the competition is to create a vehicle capable of navigating efficiently and autonomously around the course. To try and create the most efficient vehicle, we experimented with multiple wheel drives. These include front wheel drive, back wheel drive, and tank drive. We eventually went with a tank tread as we found it to have the most precise turns after testing all three different drives. Our strategy was to try and create a robot that can maneuver as smoothly as possible around the course, and to achieve this we tried and analyze our robot objectively to find flaws and to be able to fix these flaws. We sincerely hope our robot can take us all the way to nationals this year.

Wednesday, February 4, 2015: 1 - 6 p.m.

Session #1

Attendance: Michael Attanasio, Eric Liu, Andrew Rojas

Engineering class at Los Altos High School

(Hacienda Heights, California)

Task	Reflection
As the first day of the MUC journey for our team, we thought we would begin by discussing past and present rules of the competition. We read through the rules and discussed our strong points and our low points.	Our team acknowledges that we are not perfect. With a clear understanding as to what we are capable of, and what we are not capable of, we know what to focus on moving forward. This is very beneficial as we will not carelessly waste time attempting to do what we cannot and zoning in on the things we can finish quickly.
Had about a four hour discussion as to how we wanted to build the robot and what strategy we wanted to take in the competition. This discussion involved an in depth analysis of past strategies, as well as the pros and cons resulting from said strategies. We also discussed the many options we came up with in a bracketed sort of comparison. We listed all of our ideas and gathered the same ideas in a bracketed organization. For example we gathered all of the wheel types we could possibly use and then decided which we would like to use.	This is the most critical meeting we will have in the entirety of the meetings leading up until the competition. We now know which direction we are heading towards in the competition. This is crucial because there will be no time wasted as to pondering of what we are going to do. All we have to do now is to take our ideas and put them into reality.

Recorded by: Michael Attanasio	Date: 2/4/2015	Journal Coordinator: Andrew Rojas	Date:2/4/2015
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Wednesday, February 11, 2015: 1 - 6 p.m.

Session #2

Attendance: Michael Attanasio, Eric Liu, Andrew Rojas

Engineering class at Los Altos High School

(Hacienda Heights, California)

Task	Reflection
<p>We took the ideas from the drawing board as to what type of robot we are going to build, and put it into action. We began to build the basic aspects of the robot. Primarily, the brain of the robot was attached to a tank drive system today.</p>	<p>We feel as if the tank drive system will be the most beneficial to our success at the competition. While a caster wheel was considered, we decided that the most precision would be derived from a tank drive. It makes programming the robot much easier for our programmer, Andrew, as he has had experience programming a tank drive in both past years of MUC as well as outside competitions such as First Tech Challenge. With less pressure on the programming aspect of the competition, it boosts the team's confidence in our own performance capabilities.</p>
<p>Experimented with the sonar sensor aspect of the competition. The way this was done was by using a gear and a motor in order to test how to make the sensor move 360° around the robot in order to detect the other team's robot.</p>	<p>We believe that the sonar sensor should be ready to go and placed on the robot by the end of our next meeting day, Friday. With a sensor that can rotate completely around the surroundings of the robot, we will be able to detect opposing teams nearing our robot, and install a halt function if this does indeed happen. By doing this, we will be able to prevent crashes, as well as boost our score.</p>
<p>As a team, we discussed the goals of competing in the competition this year.</p>	<p>We all acknowledge that we very well could have chosen not to compete; however, we decided that the best choice for us was to in fact compete. We concurred that the focus was not only on us, but also on assisting the novice team that will be competing with us. We have a very limited amount of time to work, but we do not want to become a complacent team. We want to make the Robotics section of the engineering program we are a part of a much more active and challenging field to be.</p>

Recorded by: Andrew Rojas	Date: 2/11/2015	Journal Coordinator: Eric Liu	Date: 2/11/2015
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Friday, February 13, 2015: 1 - 3 p.m.

Session #3

Attendance: Michael Attanasio, Eric Liu, Andrew Rojas

Engineering class at Los Altos High School

(Hacienda Heights, California)

Task	Reflection
The team replaced the new tank system with the tank system we have used in the past.	We felt that the newest version of the tank treads were much too bulky for the way we are trying to build our robot. By switching to a more compact version, we are able to have a bit of leeway with the amount of space we can use on the sides of the robot. With the need to have the sensors as far out as possible, this is very important to the team. It also creates an easier job for our programmer to park the robot, as the robot is smaller in size.
We attached the color sensors to the sides and the front of the robot. We also began building a rotating sonar sensor using gears.	The team feels like the placement of the color sensors is as close to ideal as possible because we measured the width of the street lanes and the sensors are directly hovering above the lines it will be color sensing. This provides for a smoother drive and makes our drive time quicker. By having a quicker robot, we have time to park in more parking spots, boosting our performance and final score.

Recorded by: Eric Liu	Date: 2/13/2015	Journal Coordinator: Michael Attanasio	Date:2/13/2015
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Wednesday, February 18, 2015: 1 - 6 p.m.

Session #4

Attendance: Michael Attanasio, Eric Liu, Andrew Rojas

Engineering class at Los Altos High School

(Hacienda Heights, California)

Task	Reflection
<p>Repositioned the sensors on the robot. We realized the sensors were immobile, and were not far enough out that we could accomplish the parking task we were accustomed to. Because of this, we added a “stick” that can be shifted left or right that has a color sensor on each end. We also adjusted the color sensor located at the front of the robot.</p>	<p>Our team feels like our robot is quite innovative. With both a 360° rotating sonar sensor as well as the extending arm, we feel as if we are bringing forth new and creative ideas to the competition.</p> <p>The sonar sensor will allow us to detect the opposing robot on the field if it is anywhere near ours, eliminating any chance of a crash. Also, with the arm’s capability to extend, our parking function becomes much easier, smoother, and more precise. All of these factors combined make our team much more competitive, and it boosts our team’s confidence.</p>
<p>The programmer from our team, LA AE 1, had a meeting with our novice team, LA AE 2, discussing programming strategy going into this competition that is new for them. We helped our novice team by giving them old codes, mock situations, and brief lessons on functions and aspects of Robot C they had not yet dealt with.</p>	<p>It has proven to be a large challenge to assist our novice team in this competition, as well as outside aspects of the engineering program we are enrolled in. Nevertheless, it has been an integral part of our learning process for when we teach them, we learn more ourselves. It also keeps our presentation skills high, as we are constantly conveying our ideas and aspects of the code verbally and visually. We believe, as a team, that their success will somewhat model how well we helped them, so it makes us be the best we can be.</p>
<p>Our team also worked together today on building a small corner of a practice course modeling the real course the competition will be played on. We use the tape that we ordered through the Los Altos Academy of Engineering to create the parking zones as well as the streets.</p>	<p>By practicing on an actual course, we will be able to minimize any surprises or variables that have been unaccounted for going into the actual competition day. If any other teams are not using an actual model, it also gives us a slight edge over the competition having worked on the actual course before competition day, March 7th.</p>

Recorded by: Michael Attanasio	Date: 2/18/2015	Journal Coordinator: Andrew Rojas	Date: 2/18/2015
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Friday, February 20, 2015: 1 - 3 p.m.

Session #5

Attendance: Michael Attanasio, Eric Liu, Andrew Rojas

Engineering class at Los Altos High School

(Hacienda Heights, California)

Task	Reflection
Finalized the first prototype of the robot. The remaining piece of the robot that was still in the works was the rotating sonar sensor atop the robot. The hardest part about mounting this mechanism was the angle at which we needed to face the sensor downwards. Since the sensor is at the top of the robot, we needed to angle it downwards to detect robots that are possibly shorter than the sensor's height.	The team feels as if this will not be carefully taken into consideration amongst the other teams. With even the angle of the sensor being taken into consideration, we feel like this will lead to our team having a slight advantage over our competitors. With it being our first year on our own, we will take any small advantages we can possibly get. We want to scrutinize in order to succeed in the competition.
Today is the day our lead programmer began to dive into the new version of Robot C. Not much was learned today, as he assisted in angling the sonar sensor; however it was definitely a step.	One flaw of our team is procrastination. The sooner we start tasks, the fewer flaws our team has. This year, our team has made a point of working on correcting our past mistakes. These past mistakes undoubtedly include our terrible procrastination. Each time one of the items on our agenda is crossed off the list, it is a step closer to instilling a new tradition of hard work and initiative replacing our old habits of procrastination and laziness.

Recorded by: Andrew Rojas	Date: 2/20/2015	Journal Coordinator: Eric Liu	Date:2/20/2015
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Monday, February 23, 2015: 1 - 6 p.m.

Session #6

Attendance: Michael Attanasio, Eric Liu, Andrew Rojas

Engineering class at Los Altos High School

(Hacienda Heights, California)

Task	Reflection
Began creating the presentation PowerPoint for the presentation aspect of the competition. We wanted to avoid a bland and common presentation, so a lot of effort went into the look of the presentation, which is basically all that got done for it today.	Usually, for our presentations, we use the same type of design as well as the same color scheme. We almost decided to do the exact same design and color scheme as the presentation the year before. We had a group discussion about the presentation before we started making the PowerPoint, and it was decided that a lot more effort than the years before would go into the presentation. We want to make sure that we are the best team that we could possibly be.

Recorded by: Eric Liu	Date: 2/23/2015	Journal Coordinator: Michael Attanasio	Date:2/23/2015
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Wednesday, February 25, 2015: 1 - 6 p.m.

Session #7

Attendance: Michael Attanasio, Eric Liu, Andrew Rojas

Engineering class at Los Altos High School

(Hacienda Heights, California)

Task	Reflection
<p>The team began to add information to our presentation for the competition. We added 12 slides just in one day and filled the information out for about more than half of the slides. Along with the information, one of our members, Michael Attanasio, actually practiced the method by which the presentation will be presented and the order of speakers as well.</p>	<p>When compared to our previous competitions, this is a HUGE accomplishment. In both of the years prior, our team had to resort to finalizing the PowerPoint presentation the day of the competition. One method we are currently using in order to increase our efficiency and productivity is creating the presentation as if the model of the robot we currently have will be the final model. This provides us a great template to modify in order to have a complete PowerPoint encasing the entirety of our work for the competition. This organizational method keeps the team productive and focused on the competition ahead.</p>
<p>Andrew Rojas, our lead programmer, wrote a mock code on the whiteboard with variables he will simply replace with actual code in the next MUC meeting our team has (Friday).</p>	<p>Working with a new version of Robot C, as the brain of the robot has changed, has set our programmer back just a bit. By coming up with a mock code, he will be able to prepare himself, as he organizes his thoughts and more importantly, his code. With this clear organizational strategy, we will be able to maximize our time as well as our efficiency. This grants our team much needed time for practice and refinement of our skills. We as a team believe that organization leads to efficiency, the key to success.</p>
<p>Set up the wiring of the robot by choosing which length of chords we will be using for our motors and sensors. We then plugged in the chords and tested the basic functionality of the robot.</p>	<p>The team decided that before we moved forward with our robot, we needed to test each individual function of the robot. This includes the tank driving system, the sonar sensor, the color sensors, and the extending arm of the color sensor. Testing all of these aspects rather than assuming their functionality provides us insurance against wasted time in the future due to careless mistakes in the robots fundamental design. That will lend to our efficiency which we are really pushing for this year.</p>

Recorded by: Michael Attanasio	Date: 2/25/2015	Journal Coordinator: Eric Liu	Date:2/25/15
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Friday, February 27, 2015: 1 - 3 p.m.

Session #8

Attendance: Michael Attanasio, Eric Liu, Andrew Rojas

Engineering class at Los Altos High School

(Hacienda Heights, California)

Task	Reflection
<p>As a team we performed a multitude of tasks. The first of which was adding information and pictures to the PowerPoint. The team took about 20-25 photos of the robot and its specific parts in order to highlight the several aspects of "The Adapter". Added information to the PowerPoint includes a pro and con list of our current model of the robot, programming specifics, and a summary of what our robot is composed of (its dynamic aspects such as drive system, use of sensors, and mobilization of the sensors).</p>	<p>Right now we are writing the PowerPoint as if the current model of the robot will be the final model. Obviously, this is not going to be true, as testing the robot will necessitate variations to help perfect the robot's performance. By having a template, however, it allows us to have a much easier time writing the final presentation (especially when compared to the past). In our two preceding competitions, we waited until the final product of the robot was built which proved to be highly INEFFECTIVE. By working as we go, not only will it be less work, it will make our presentation much better and much more refined.</p>
<p>Our programmer, Andrew Rojas, took his mock code that he had written on our whiteboard, and transferred a small amount of it to actual Robot C program. While writing his own code, he also assisted our rookie team, also known as LAAE 2, in writing their code and learning the ropes of the new version of Robot C.</p>	<p>It is very important to us as a team to not only focus on ourselves, but also assist those in our area of engineering who need assisting. In years prior, we have taken on students from Wilson High School on our team, however this year, we have taken to assisting those within our own engineering program. Within I.T./Robotics, we have taken on four new members that we are teaching/assisting, as well as one member from L.A.A.E.'s electrical team that we are helping to prepare for the upcoming competition. We believe all of this assistance will serve to both help the other team, and help ourselves as well.</p>
<p>We gathered our massive team of 3 for our team picture that we will use for MUC.</p>	<p>This was a simple, yet important task. We do not want to be an organization that is strictly about business. We also pride ourselves on being a great team with our teamwork at phenomenal levels. Being friends in and out of the program makes the environment here a much more enjoyable and friendly one. With such a comfortable workplace, it makes it much easier to work.</p>

Recorded by: Andrew Rojas	Date: 2/27/2015	Journal Coordinator: Eric Liu	Date:2/27/2015
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Monday, March 2, 2015: 1 - 6 p.m.

Session #9

Attendance: Michael Attanasio, Eric Liu, Andrew Rojas

Engineering class at Los Altos High School

(Hacienda Heights, California)

Task	Reflection
<p>Unfortunately, while transporting our robot from one of our team member's cars to the engineering room, the robot was dropped and broken. The task for the day then, was to piece the robot back together as accurately as possible. The drive system and the major aspects of the robot were intact, however, the contraption that held it all together was in pieces.</p>	<p>This sets the team back a bit. For one thing the robot is much less compact and not as tidy. Another downfall with the literal downfall is that we have no other reason for the second modification of the robot other than that it was dropped. A great thing of our team however, is our teamwork. We laughed and shook off the mistake and immediately worked to remedy what had happened. Although it was a major mistake on the part of our team, it has also served to improve us as a team and as competitors.</p>
<p>The executive summary was officially finished today. It was not started today and has actually been a work in progress for quite some time, but today was the official day that the work was done, and we finished proofreading the summary twice per member. After we came to a consensus as to what the final product was, we were able to submit the summary and move on to our next set of tasks.</p>	<p>This served as a bit of a bounce back from the mistake of dropping the robot. It boosted our spirits. With having one less item on our plate to worry about, it alleviated the stress within the team concerning the competition. We are trying to stay as relaxed as possible with deadlines in the immediate future. The competition is looming over us and with this summary written to the best of our capability and officially done; it makes the upcoming competition seemingly less threatening. We have faith in ourselves of our ability to persevere.</p>
<p>Formatted and revised the journals we had been writing since the requirement of the journals was announced. We had an abundance of information as to what we had completed on a day to day basis, but it had not yet been organized to the task/reflection format that we currently have. Organizing the information included creating a template on Microsoft Office Word, creating an email account that each team could submit their finished journals, and coordinating the team members who had written the journal and the editor.</p>	<p>A constant team motto throughout any competition this team has been a part of is that "organization is key". We have seen, several times in fact, that lack of organization can come back to severely hinder a team's performance. With a measured, organized approach, our team is protected from loss of information that could be vital to the presentation or journal aspect of the competition.</p>

Recorded by: Eric Liu	Date: 3/2/2015	Journal Coordinator: Michael Attanasio	Date:3/2/2015
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Wednesday, March 4, 2015: 1 - 6 p.m.

Session #10

Michael Attanasio, Eric Liu, Andrew Rojas

Engineering class at Los Altos High School

(Hacienda Heights, California)

Task	Reflection
We created a packing list so we have everything ready for the competition. The team started to write down anything we might need for the competition. We also planned ahead such as figuring out what we will eat for lunch.	A packing list is imperative for staying organized. We wanted to be able to stay on schedule and not forget anything to the competition. The competition is quite far, so if we forget anything at our school, we will be unable to pick it up.
The team started to finalize all of the necessary tasks. These tasks include finishing the robot, concluding our journals, along with finalizing our programming code.	We did not want to cram everything the night before, hence we wanted to finish everything early. We made some finishing touches to the robot. Next, we also worked on the finalizing the code.

Recorded by: Michael Attanasio	Date: 3/4/2015	Journal Coordinator: Andrew Rojas	Date:3/4/2015
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Friday, March 6, 2015: 1 - 6 p.m.

Session #11

Attendance: Michael Attanasio, Eric Liu, Andrew Rojas

Engineering class at Los Altos High School

(Hacienda Heights, California)

Task	Reflection
We made sure we all had our consent forms. The school and district requires two forms filled out by all of the participating students in case of an emergency. These forms are crucial and mandatory if the team wishes to compete.	There have been instances in the history of our program (LAAE), where teams have forgot forms and have been unable to compete. We do not want to embarrass our organization and school by forgetting to bring our forms. We made an emphasis on being more organized this year.
Our team packed up and prepared for the competition.	The team completed everything, from the powerpoint, to the robot, along with everything ready to go. We hope our hard work will pay off and we will perform well at the competition.

Recorded by: Michael Attanasio	Date: 3/6/2015	Journal Coordinator: Andrew Rojas	Date:3/6/2015
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MINI-URBAN CHALLENGE

FTC Engineering Notebook

2014-2015

By: Calvin Hsieh, Jason Kwan, Isaiah Sotelo, Jacky Zhang



Executive Summary

The problems for our team this year for MUC is that our team is constructed of rookie members. Most of us have very little experience building robots and programming with RobotC. The only formal training that we had with the sensors and RobotC, in general, is looking through the NXT training sample program and tinkering with values. Because of the requirement for the use of the new EV3 brain, we had to look over the help menu to see what changes are made for each function. In addition, it is our first time competing in MUC, so it has been quite a challenge trying to program a robot that would work for such specific conditions. Because we are the team being the rookie team, we are an amalgamation of students that are in different grade levels and diverse time schedules. This causes a lot of problems with scheduling conflicts for the entire team to meet together. Furthermore, many team members also have other commitments to attend to because it can risk their grades. Over half of our team participates in our school's tennis team and practices every day because absences will cause their grades to drop. As a result, on the days when we usually meet, there are only two people that are working on building the robot, coding the robot, or working on journals. It has truly been a learning experience and has not only taught us about coding, but also about management and organization.

For our team our only goal for MUC is to try to do sufficiently well. Many of our members are often absent and most are confused on what to do. Our team even started sacrificing our grade in sports in order to meet with the team and contribute. Moreover, two of our five members are graduating seniors and they are trying their hardest to lead the team in the right direction for next year and try their hardest on their first and last MUC.

Our strategy is to try to build a simple robot that can "line-trace" and maneuver the "city". Our primary concern is the intersections because we would require more coding and integration of sensors onto our robot to detect incoming robots. We decided to create a simple tank tread robot so that turning would be more precise. We also attached two color sensors on both sides of the robot and one in the middle, so that the robot can more accurately "line-trace" the non-linear course. We also decided to use a sonar sensor to detect whether there is another robot coming toward the intersection and calculate the distance the robot is away from our robot, so that it can safely turn.

2:49p.m. - 6:00p.m. Monday, 26th January, 2015

Session #1: Engineering Class @ Los Altos High School (Hacienda Heights, California).

Attendance: Isaiah Sotelo, Jacky Zhang, Jason Kwan, Calvin Hsieh

Activities:

1. Received a new Lego EV3 box.
 - We received a shipment of the new Lego EV3 box and started to examine what new contents we were now allowed to use during the construction of our robot. We noticed that the new Lego EV3 contained a new NXT brain i.e. EV3 brain with more motor ports and a better UI. Also there was a sizable amount of other newly designed sensors and new pieces for us to use at our disposal. We also noticed that we needed to download a newly updated RobotC for us to program the robot.
2. Organized the new Lego EV3 box.
 - Once we took notice of all of the pieces that were housed within the new EV3 box, we decided to organize the pieces so that we will be able to quickly pick out pieces that we need in order build the robot. By doing so we will be effectively cutting time for locating specific pieces that we need within a jumbo pile of Lego pieces that surprising does take a decent amount of our building time when just looking for pieces. We organized the box by sensors, axels, technic pieces, and small connector pieces.

Recorded by: Jason Kwan	Date: 1/26/15	Journal Coordinator: Jacky Zhang	Date: 1/26/15
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2:49p.m. - 6:00p.m. Wednesday, 28th January, 2015

Session #2: Engineering Class @ Los Altos High School (Hacienda Heights, California).

Attendance: Isaiah Sotelo, Jacky Zhang, Jason Kwan, Calvin Hsieh

Activities:

1. Built a variety of robots using old Lego pieces.
 - The new Lego pieces supplied were very limited and so we decided to make a whole bunch of other robots with varied drives and body composition. The 1st one was a tank drive that was very tall vertically but very skinny horizontally. The 2nd one was also a tank drive that was very short vertically but very wide horizontally. The 3rd one was a castor wheel drive that was very short vertically and thin horizontally. The 4th one was a 4 wheeled drive that was very wide but very short. The 5th one was also a 4 wheeled drive that was very thin but very tall as well.
2. Voted on which drive and body composition is the best
 - We decided to choose what drive we wanted and we immediately eliminated the 2, 4 wheeled drive system for they were not stable compared to the other 3. We then decided between tank and castor and with a vote of 3-2, the tank drive was chosen to be used as our drive. For body composition we decided that the tank shouldn't be too wide or tall. However we knew we couldn't make the body composition short and thin so we decided that a middle ground between thin and wide and short and tall is preferable.

Recorded by: Jason Kwan	Date: 1/28/15	Journal Coordinator: Jacky Zhang	Date: 1/28/15
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2:49p.m. - 6:00p.m. Monday, 2nd February, 2015

Session #3: Engineering Class @ Los Altos High School (Hacienda Heights, California).

Attendance: Isaiah Sotelo, Jacky Zhang, Jason Kwan, Calvin Hsieh

Activities:

1. Building from the ground up beginning with the wheels.
 - With the drive system and body composition voted upon and decided, we then quickly began to construct the robot. What we decided to focus on building was the tank drive. The new EV3 Lego box provided us with a new form of tank treads and we began to investigate how the new tank treads worked. After we got a good idea on what the new tank treads were like, we made the basis of the tank tread system.
2. Building the chassis and connecting to the wheels.
 - After building the wheels were started to make a frame to connect the tank treads to the rest of the robot. We then used the entirety of the frame pieces provided to us and we formed a very “basic” and “simple” chassis of the robot. The other main focus was stability with the frame of the robot. Once the chassis was finished, we then attached a bunch of extra technic pieces in order to make the chassis more stable and to secure the main chassis with the tank treads. However, a problem occurred, when we tried to attach the tank treads to the chassis, there was no room at the front to attach the sensors on so then we brainstormed ways on how to effectively solve this lack of space.

Recorded by: Jason Kwan	Date: 2/2/15	Journal Coordinator: Jacky Zhang	Date: 2/2/15
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2:49p.m. – 6:00p.m. Wednesday, 4th February, 2015

Session #4: Engineering Class @ Los Altos High School (Hacienda Heights, California).

Attendance: Isaiah Sotelo, Jacky Zhang, Jason Kwan, Calvin Hsieh

Activities:

1. We brainstormed chassis to fix our space issue.
 - One issue that we were concerned about was how we could add our color sensors and sonar sensor. We did not know if the sensors could stick out as much as we planned to. The problem is that the color sensors need to be close to the floor to interpret the color, yet far away enough so that the shadow does not cause the color sensor to identify the color tape as Black. Secondly, our sonar needed to be mounted on the right side so that our robot can let the robots from the right move forward in an intersection. We decided to create a second secure frame that would allow the sensors to be mounted onto the robot.
2. We started to work on our Keynote presentation.
 - Because we wanted everyone to always contribute to the team, we felt half of our team should dedicate themselves to constructing our presentation. They had no idea how to construct the presentation properly, so they had to ask our veteran members for guidance. While they were constructing it, they realized we were missing lots of things such as our biographies. We were lacking photos of our members which were hard to coordinate because some of our members only come once or twice in one week due to other commitments.

Recorded by: Calvin Hsieh	Date: 2/4/15	Journal Coordinator: Jacky Zhang	Date: 2/4/15
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2:49p.m. – 6:00p.m. Monday, 9th February, 2015

Session #5: Engineering Class @ Los Altos High School (Hacienda Heights, California).

Attendance: Isaiah Sotelo, Jacky Zhang, Jason Kwan, Calvin Hsieh

Activities:

1. We started to look at our engineering program's previous Mini Urban Challenge code.
 - We had two members look at what last year's teams wrote for the code to accomplish the goals, and tried to learn from them. Even though the tasks for the competition were intimidating, we felt we accomplished some progress and learned what we will need to do for our functions. Since everyone on the team is not adept with coding as the veteran team is, we encountered many troubles understanding the code. With the addition of the new EV3 software, it was harder to transition the old code methods we learned into the EV3 format. We realized that although the EV3 coding was made to be easier, it only confused our team since we have been coding with the NXT's for an extensive amount of time.
2. We continued to work on our presentation.
 - Our other half gradually began filling in the missing portions of information we had. There were many conflicts between members on the design of the presentation, but we all eventually came to a consensus for the time being.

Recorded by: Calvin Hsieh	Date: 2/9/15	Journal Coordinator: Jacky Zhang	Date: 2/9/15
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2:49p.m. – 6:00p.m. Wednesday, 11th February, 2015

Session #6: Engineering Class @ Los Altos High School (Hacienda Heights, California).

Attendance: Isaiah Sotelo, Jacky Zhang, Jason Kwan, Calvin Hsieh

Activities:

1. We attempted to integrate sensors into our robot.
 - We tried to put the sensors onto our robot, but we had no idea how the code was going to be formatted. We put on the color sensors and sonar sensor on our robot based on how we assume our code will be set up. By doing this, we could at least have building out of the way for now until we have our code written up.
2. We prepped for our engineering advisory.
 - Important people from each team in our engineering program began to prepare for our advisory. Members had to be momentarily pulled out of what we were working on to help judge as well as present for the advisory. The purpose of holding the advisory is to get our program approved for the future.
3. We reviewed the updated version of the rule book.
 - We were notified that the rules had changed into the month and so we printed out a copy of it. We looked over the new rules and found out that they took out the Bluetooth portion of the competition. While it didn't have to change how our code was written so far, it definitely made the job a little easier for our coders.

Recorded by: Calvin Hsieh	Date: 2/11/15	Journal Coordinator: Jacky Zhang	Date: 2/11/15
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2:49p.m. - 6:00p.m. Monday, 16th February, 2015

Session #7: Engineering Class @ Los Altos High School (Hacienda Heights, California).

Attendance: Isaiah Sotelo, Jacky Zhang, Jason Kwan, Calvin Hsieh

Activities:

1. Started planning the presentation for Mini Urban Challenge.
 - We realized the rulebook states that we have ten minutes to present and five minutes of questions/answers. So for the next ten minutes we started to formulate a guideline to help us along. So we made a general overview of how we were going to present our PowerPoint and in what order. The general order we came up with was; intro, community outreach, robot presentation, coding, and errors which required us to modify and move around slides. We are also considering making and adding a short video and slideshow to the presentation.
2. We adjusted the sensor placement on the robot.
 - With the code being developed, we started to integrate the sensors with actual code in mind instead of flying blind. The sonar sensor would be placed on the top and the three color sensors in the lower front. One problem we had was actually getting the sensors to hold up slightly above the ground and in good placement to read the color tape. First we had them all connected on one long piece sticking across the front which was ineffective. So we added a small frame above the tank treads and were able to attach each sensor individually.

Recorded by: Isaiah Sotelo	Date: 2/16/15	Journal Coordinator: Jacky Zhang	Date: 2/16/15
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2:49p.m. - 6:00p.m. Wednesday, 18th February, 2015

Session #8: Engineering Class @ Los Altos High School (Hacienda Heights, California).

Attendance: Isaiah Sotelo, Jacky Zhang, Jason Kwan, Calvin Hsieh

Activities:

1. Recorded Videos and took photos

- We decided to make a short “inspirational” video and make a slide show to include at the end of the presentation. So immediately we started to take some photos of us working on the robot. However, we were still missing photos and videos that we still needed for the presentation. For example, when we shot a video of the robot being tested for the first time with EV3 coding integrated. The robot was not tested with our competition code but with simple coding to try and work out how the new EV3 platform operates.

2. We started working on the presentation

- We finally decided that we wanted to include a video and slideshow in the presentation. We then attempted to rehearse our presentation by using the layout that we had made earlier. We also considered adding many flashy and comic effects to the presentation but after much debate, we realized it should look professional not “cool”. So we reviewed the slides, got rid of the flashy effects, and selected a theme that conveyed our professionalism.

Recorded by: Isaiah Sotelo	Date: 2/18/15	Journal Coordinator: Jacky Zhang	Date: 2/18/15
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2:49p.m. – 6:00p.m. Monday, 23th February, 2015

Session #9: Engineering Class @ Los Altos High School (Hacienda Heights, California).

Attendance: Isaiah Sotelo, Jacky Zhang, Jason Kwan, Calvin Hsieh

Activities:

1. Recorded and edited the video

- We decided to make the video like a short commercial with enjoyable music and a meaningful speech. So we began with the monologue. We wrote it based off the idea of progress and technology. Then after writing it we scoured the internet looking for inspiration. We included some videos that we felt would remind people of the community and paired it with thoughtful music. We then recorded our speeches to pair with the video. Finally we edited the parts together and created our little inspirational video.

2. Finalized the slideshow.

- We integrated missing video and pictures into iMovie. After, we reviewed the presentation and fixed anything that was wrong or not included. We then added the video and slideshow to the presentation with the help of iMovie. When we tried to move the file, we realized the PowerPoint-like application on Macs did not transfer onto Windows. After some research in hope of not losing our progress, we just redid it on Microsoft PowerPoint. Luckily, we discovered a method to convert the Keynote presentation to a PowerPoint. We then converted it over and transferred it to a USB.

Recorded by: Isaiah Sotelo	Date: 2/23/15	Journal Coordinator: Jacky Zhang	Date: 2/23/15
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2:49p.m. - 6:00p.m. Wednesday, 25th February, 2015

Session #10: Engineering Class @ Los Altos High School (Hacienda Heights, California).

Attendance: Isaiah Sotelo, Jacky Zhang, Jason Kwan, Calvin Hsieh

Activities:

1. Further dissected and integrated older code.
 - We continued to analyze and modify old codes from the engineering program and apply it to our robot build. Modifying the code was crucial because of the new EV3 we were required to use.
2. Began to test our robot.
 - Our robot and code were ready to test out. We had foam mats in the engineering program that was taped with various colors of electrical tape for past Mini Urban Challenge tests. We quickly ran into some issues such as the build we had on the robot. The EV3 and the way the robot was built put immense amounts of strain on the motors and tank treads, making the middle of the robot sink down and the tank treads protrude at an awkward angle that disrupted our testing for consistency. Despite this we set aside the problem of the robot build in order to at least test the code. We quickly realized that our robot had trouble tracing the taped line and pondered what the issue could have been. We threw around ideas on what it could be such as the distance of the sensor from the ground or even if the color sensors are even functioning. We looked at the sensors and it seemed that our NXT color sensor was not functioning.

Recorded by: Jacky Zhang	Date: 2/25/15	Journal Coordinator: Jacky Zhang	Date: 2/25/15
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2:49p.m. - 6:00p.m. Monday, 2th March, 2015

Session #11: Engineering Class @ Los Altos High School (Hacienda Heights, California).

Attendance: Isaiah Sotelo, Jacky Zhang, Jason Kwan, Calvin Hsieh

Activities:

1. We consulted an older member of our team.
 - We started a video chat with a graduated member of our engineering program to look for insight on the coding for Mini Urban Challenge. Ultimately since most of us had other things on our agendas, we could not adequately learn enough from our member in such a short time.
2. We looked over the version 3 edition of the rules.
 - We were notified that the rules for the competition had been revised again. Due to this, we printed out the new rules and reviewed them again. The team was concerned about the release of updated news as it may affect how we conducted our business so far. It appeared to include more in depth explanations to aspects of the competition which helped us a little bit with our understanding of how it worked.
3. We reconstructed our robot.
 - We had to deal with the issue of the weight on our tank treads and motors so we reconstructed it again. We built a sturdier base that would not put as much strain on the treads and motors which we feared would be damaged if we left it the way it was. When it was tested, the robot ran in a straighter line more consistently.

Recorded by: Jacky Zhang	Date: 3/2/15	Journal Coordinator: Jacky Zhang	Date: 3/2/15
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2:49p.m. - 6:00p.m. Wednesday, 4th March, 2015

Session #12: Engineering Class @ Los Altos High School (Hacienda Heights, California).

Attendance: Isaiah Sotelo, Jacky Zhang, Jason Kwan, Calvin Hsieh

Activities:

1. Researched our problem with our sensor.
 - When our NXT sensor did not function on our robot, we researched the problem. We stumbled across a post on a forum that said some NXT sensor did not work with the EV3 but every other source said the EV3 was compatible; we were hopelessly confused on why our sensor did not work. Eventually we agreed to work around the problem and came up with a possible alternative using reflected light.
2. We tested the robot.
 - With as much as we can prepare for with our time, we began to do final testing of our robot with our code. We managed to get the sensors to function and we continued to test on our foam mats. We encountered many problems with our code with many errors we cannot seem to fix. With the errors in mind, we just tested for what we can do and hope to perform to the best of our ability.
3. We rehearsed our presentation.
 - Seeing as the presentation counts as 30% of our score, we rehearsed our presentation together. Doing so, we got a firm grip of our presentation and got more confident with speaking.

Recorded by: Jacky Zhang	Date: 3/4/15	Journal Coordinator: Jacky Zhang	Date: 3/4/15
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