# Team Minutes for Team 5

| Team Members' Names |
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| *Brennen Ward* |
| *Kodi Morris* |
| *Erick Garcia* |
| *Benjamin Selph* |

## Meeting 1

| Meeting Date:<br><br>*Friday, Feb 12th* | **Start Time: 11:00 AM  End Time:  *11:40 AM***<br>**Summary of Meeting**<br>**The team discussed and filled out the contents of the team charter.** |
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| 1. Attendance | *All members were presents for this meeting.* |
| 2.  Purpose of Meeting | *To complete the Team Charter and speak with one another about expectations, rules, etc.* |
| 3. Discuss work completed since last meeting. | *Not much work as the Mini Project had not begun. We each finished our respective Assignment #2s.* |
| 4.  Summarize work completed during meeting | *We all worked together to fill out the Team Charter.* |
| 5. Review action items to be completed after meeting | *By next meeting we will have all reviewed the Mini Project instruction document.* |
| 6.     Schedule next meeting | *Next meeting will be during class time on Wednesday, Feb 17th.* |

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| 7. Recording secretary | Ben Selph was the recording secretary. |

## Meeting 2

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| **Meeting Date:**<br><br>**Wed, Feb 17th** | **Start Time:  11:00 End Time: 11:30**<br>**The team sorted out who was going to complete which section for the Mini Project and set tentative due dates for each task.** |
| 1. Attendance | All members were in attendance. |
| 2. Purpose of Meeting | Assign parts of the instructional document to the respective team member that knows how to complete the sections in order to begin work on the Mini Project. |
| 3. Discuss work completed since last meeting. | We all briefly reviewed the Mini Project Instruction document in order to familiarize ourselves with the general scope of the assignment and what tasks need to be done to complete it. |
| 4. Summarize work completed during meeting | We all were assigned sections of the Mini Project and planned our next meetings. |
| 5. Review action items to be completed after meeting | Begin to work on the code for our respective sections so that we can start to work together to complete the code. |
| 6. Schedule next meeting | Friday, Feb 19th during class time |
| 7. Recording secretary | Benjamin Selph |

## Meeting 3

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| **Meeting Date:**<br><br>**Fri, Feb 19th** | **Start Time: 11:00 End Time: 11:50**<br>**Reconvened and shared our code thus far, Brennen finished construction of the wheel.** |

| 1. Attendance | *All members except for Erick, as he is quarantined from COVID-19 Exposure.* |
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| 2. Purpose of Meeting | *Initially reconvene, share code, and applying code to the completed wheel.* |
| 3. Discuss work completed since last meeting. | *Brennen constructed the wheel, the rest of the team each worked on beginning the code necessary to complete the respective sections.* |
| 4. Summarize work completed during meeting | *Brennen worked to tune in the control system, Kodi and Ben worked on their code to transfer Aruco data from RPI to Arduino. Erick worked on his section of the code remotely.* |
| 5. Review action items to be completed after meeting | *Continue to compile code. Ben and Kodi will work together to combine their codes such that the camera will function and RPI and Arduino will communicate correctly.* |
| 6. Schedule next meeting | *Monday, Feb 22nd During Class time* |
| 7. Recording secretary | *Benjamin Selph* |

## Meeting 4

| Meeting Date:  Sun, 21 Feb | **Start Time:  *2:30 PM*  End Time: 3:30 PM** **Summary of Meeting** Kodi and Ben met to combine the computer vision and system integration code to begin testing data transfer using the camera. |
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| 1. Attendance | Kodi and Ben. (Erick was in quarantine, Brennen was not needed to accomplish the intention of the meeting.) |
| 2. Purpose of Meeting | Kodi and Ben combined their code, being computer vision and systems integration respectively, in order to enable the group to send data from the raspberry pi camera into the Arduino. Brennen had completed the control and simulation code so we wanted to get virtually all parts completed in their own rights. |

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| 3. Discuss work completed since last meeting. | All individual codes have been completed. What is left is to integrate all code together to get the final result. |
| 4. Summarize work completed during meeting | Kodi and Ben were able to successfully integrate their codes together and get the camera to send a quadrant number to the Arduino, which was then able to send the number back to the Pi. |
| 5. Review action items to be completed after meeting | Ben: Get the LCD screen to display the current radian value of the wheel. Kodi: Make the camera take photos continuously as described in the instructions. Brennen: Create code documentation for integration and code turn in. Erick: Review all the code in GitHub, tune the motor encoder. |
| 6. Schedule next meeting | Tomorrow during class. (Monday, 22 Feb) |
| 7. Recording secretary | Ben Selph |

## Meeting 5

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| **Meeting Date:** <br><br> **Mon, 22 Feb** | **Start Time: 11:00AM End Time: 11:30** <br> **Summary of Meeting** <br> The team touched base on where we stood as far as being able to put all code together. |
| 1. Attendance | Ben, Kodi, Brennen. (Erick was still in quarantine.) |
| 2. Purpose of Meeting | To see how all of our code looked as far as integrating it together. |
| 3. Discuss work completed since last meeting. | Brennen began to document his bulk of code, Ben and Kodi fine tuned their combined code and tested how it worked, Erick familiarized himself with he code we had written thus far. |
| 4. Summarize work completed during meeting | Brennen, Ben and Kodi got on the same page so that the proper changes could be made to the motor code in order to finally integrate all code together. |

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| 5. Review action items to be completed after meeting | Ben: document code properly<br>Brennen: prepare control and simulation code to be integrated based on the variables in the CV and SI code<br>Kodi: Document code properly<br>Erick: get out of quarentine |
| 6. Schedule next meeting | Wednesday, 24 Feb, during class |
| 7. Recording secretary | Ben Selph |

## Meeting 6

| Meeting Date:<br><br>*Wed, 24 Feb* | **Start Time: *11:00* End Time: 12:00**<br>**Summary of Meeting**<br>All code was integrated and initial tests were conducted. |
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| 1. Attendance | All group members were in attendance. |
| 2. Purpose of Meeting | To integrate all code and begin to test and fine tune our system and wheel. |
| 3. Discuss work completed since last meeting. | All code was properly prepared for integration, and the team began to comment and document our code. |
| 4. Summarize work completed during meeting | The code was integrated and the wheel was tested. As it did not work perfectly at first, we spent a majority of the meeting tweaking and testing. |
| 5. Review action items to be completed after meeting | Ben: Comment code adequately, assist in getting final code running as efficiently as possible.<br>Brennen: Comment code, assist in getting final code running as efficiently as possible.<br>Kodi: Comment code adequately, assist in getting final code running as efficiently as possible.<br>Erick: Comment code adequately, assist in getting final code running as efficiently as possible. |
| 6. Schedule next meeting | Friday, 26 Feb, during class. |

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| 7. Recording secretary | Benjamin Selph |

## Meeting 7

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| **Meeting Date:**<br><br>Fri, Feb 26th | **Start Time:** *11:00* **End Time: 11:50**<br>**Summary of Meeting**<br>Demonstrated our code to the lab instructor. |
| 1. Attendance | All group members in attendance |
| 2. Purpose of Meeting | To demonstrate our final code and function of our system. |
| 3. Discuss work completed since last meeting. | All code was integrated, debugged and tested to function in the way that the instruction document described. Code was commented and documentation was begun to prepare for the final submissions |
| 4. Summarize work completed during meeting | Final small tweaks to code were made, and the function was demonstrated. The demonstration was successful. |
| 5. Review action items to be completed after meeting | There were no specific tasks assigned other than Ben gathering example code to send multiple bytes across systems for Mondays Technical Meeting. |
| 6. Schedule next meeting | Monday, Feb 26, 11:25 AM |
| 7. Recording secretary | Benjamin Selph |

## Meeting 8

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| **Meeting Date:**<br><br>*Mon,March 1st* | **Start Time:** *11:00* **End Time: 11:50**<br>**Summary of Meeting**<br>Technical review with Professor Vincent and planning for Demo 1. |
| 1. Attendance | All members were present. |

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| 2.  Purpose of Meeting | To conduct our technical review with Professor Vincent and begin our planning of tasks to be done for beginning Demo 1. |
| 3. Discuss work completed since last meeting. | As there weren't any specific tasks assigned, there was not any work completed since our demonstration on Friday. |
| 4.  Summarize work completed during meeting | Technical review was held, and the code transferring data from the Arduino to the Pi was cleaned up to send over blocks of data without using loops. |
| 5. Review action items to be completed after meeting | All members: Read Demo 1 instructions and begin to think of roles.<br>Brennen and Ben: Will come in together tomorrow to begin the construction of the Robot.<br>Kodi and Erick: Review methods of completing tasks requested in Demo 1 Instruction manual. |
| 6.  Schedule next meeting | Tuesday, March 2nd at 11. |
| 7.  Recording secretary | Benjamin Selph |

## Meeting 9

| Meeting Date:<br><br>*Tues, Mar 2nd* | **Start Time:  *11:00* End Time:  *12:10***<br>**Summary of Meeting**<br>**Ben and Brennen worked on the construction of the robot base.** |
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| 1. Attendance | Ben and Brennen. (Erick and Kodi had class.) |
| 2.  Purpose of Meeting | To begin construction of robot base in order to enable the team to begin to code and test operation of the robot. |
| 3. Discuss work completed since last meeting. | The team familiarized themselves with the Demo 1 instructions and deliverables. |

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| 4. Summarize work completed during meeting | Brennen and Ben got the Robot base built and ready to have the hardware mounted. |
| 5. Review action items to be completed after meeting | Kodi: Begin to write code for the CV related section of Demo 1.<br>Erick: Begin to write code for localization related section of Demo 1.<br>Ben: Assist both Brennen and Kodi with their tasks.<br>Brennen: Come into lab early on Wednesday to finish robot construction and get motor function up and running. |
| 6. Schedule next meeting | Wednesday, March 3rd during class time. |
| 7. Recording secretary | Benjamin Selph |

## Meeting 10

| Meeting Date:<br><br>**_Wed, Mar 3rd_** | **Start Time: _11:00_ End Time: _11:50_**<br>**Summary of Meeting**<br>Finished the full construction of the robot and successfully got the motors and wheels running to move the robot body. |
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| 1. Attendance | All members in attendance |
| 2. Purpose of Meeting | To finish the full robot and test its motor function so we can begin to test the code we will write this week. |
| 3. Discuss work completed since last meeting. | Kodi began to write the CV code to complete the first part of Demo 1. Brennen came in early to start work on the robot. Ben and Erick assisted Brennen with the completion of the Robot after some issued with hardware arose and set the robot back. |
| 4. Summarize work completed during meeting | The robot was fully built and is operating with wheels on motors. The team all collaborated and hashed out who was going to complete which parts of the code to get it fully finished and integrated. |
| 5. Review action items to be completed after meeting | Kodi: Finish the CV code<br>Ben: Help Kodi with the CV code and work on the Systems integration code.<br>Erick: Work on code to operate function of the motor and wheels<br>Brennen: Get the control system stable and make the wheels turn at the same rate. |
| 6. Schedule next meeting | Friday, March 5th, during class time. |

| 7. Recording secretary | Benjamin Selph |
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## Meeting 11

| Meeting Date:<br><br>*Fri, Mar 5th* | **Start Time:** *11:00*  **End Time:** 11:50<br>**Summary of Meeting** |
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| 1. Attendance | Brennen, Erick, Ben, (Kodi working on code from home) |
| 2. Purpose of Meeting | Touch base on progress and continue to work on the function of the robot. |
| 3. Discuss work completed since last meeting. | Brennen worked on the PID system. Kodi continued to work on the CV code. Ben worked on the Team Minutes document. Erick assisted Brennen with the motor control. |
| 4. Summarize work completed during meeting | The robot was having some problems calculating the correct phi value. This was solved by turning the robot off, unplugging it and plugging it back in. Kodi stayed at home and tested the accuracy of the angle code. |
| 5. Review action items to be completed after meeting | Ben: will mount the extra raspberry pi to the robot so Brennen can access and program the Arduino through the VNC with the Pi.<br>Brennen: will continue to work on the PID with the assistance of Erick.<br>Erick: will assist Brennen in motor control.<br>Kodi: will work together with Ben to finish the code needed for the CV portion of the demonstration. |
| 6. Schedule next meeting | Mon, Mar 8th, during Class |
| 7. Recording secretary | Benjamin Selph |

## Meeting 12

| Meeting Date:<br><br>Mon, Mar 8th | **Start Time:** *11:00*  **End Time:** 11:50<br>**Summary of Meeting**<br> Brennen and Erick worked on the motor function, Ben and Kodi finished the CV section. |
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| 1. Attendance | All members were in attendance. |

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| 2. Purpose of Meeting | To meet and work on our respective Demonstration tasks to begin to finish function and start to test accuracy. |
| 3. Discuss work completed since last meeting. | The Pi mount was added to the robot by Ben. Now the robot can be powered and programmed without being connected to another CPU. Kodi finished the CV code. Brennen and Erick worked on the second half of the demonstration deliverables. |
| 4. Summarize work completed during meeting | Ben and Kodi integrated the LCD function into the CV code so that the LCD cleanly displays the angle of a beacon from the camera that is calculated in the CV code. Brennen and Erick worked on troubleshooting the motors on the robot. |
| 5. Review action items to be completed after meeting | Kodi and Ben: make a stable beacon to put an aruco marker on to test the accuracy of the angle calculations in preparation for the Demo.<br><br>Brennen and Erick: work on finishing the robot function to begin to test and tweak code in preparation for Demo1. |
| 6. Schedule next meeting | Wednesday, Mar 10th, during class time. |
| 7. Recording secretary | Benjamin Selph |

## Meeting 13

| Meeting Date: | **Start Time: _11:00_ End Time: 11:50**<br>**Summary of Meeting**<br>The two man teams of Brennen and Erick, Kodi and Ben worked to prepare the performance of the subsystems to demo. |
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| Wed, Mar 8th | |
| 1. Attendance | All members were in attendance. |
| 2. Purpose of Meeting | To prepare our group subsystems for demonstration next week. |
| 3. Discuss work completed since last meeting. | Ben constructed a marker beacon out of extra body beams.<br>Brennen and Erick worked on the consistency and smoothness of the Robot.<br>Kodi began preliminary testing of CV code. |

| 4. Summarize work completed during meeting | Brennen and Erick were able to get the robot to fulfil both of the movement demonstration parts working. Kodi and Ben tested the accuracy of the camera angle with a yardstick and triangle geometry. |
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| 5. Review action items to be completed after meeting | Kodi is bringing the camera setup home in preparation for the winter storm predicted for this weekend. He is going to work on improving the accuracy of the camera angle. Brennen is bringing home the Robot. Erick is organizing the Github to prepare for final documentation. Ben is assisting Kodi with whatever he needs and completing the team minutes document. |
| 6. Schedule next meeting | Friday, Mar 12th, during class time. |
| 7. Recording secretary | Benjamin Selph |

## Meeting 14

| Meeting Date: Fri, Mar 12th | Start Time: *11:00* End Time: *11:50* <br> **Summary of Meeting** <br> The team completed all part of the demonstration requirements and discussed actions to take further. |
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| 1. Attendance | All members in attendance |
| 2. Purpose of Meeting | Complete the demonstration deliverable testing and tweaking. |
| 3. Discuss work completed since last meeting. | Kodi finished making the camera angle more accurate. Brennen made the robot movement more precise. Erick created the new Github directory and Ben filled out the team minutes document. |
| 4. Summarize work completed during meeting | All the demo deliverables were tested and shown to members of the team. All of it works now as per the instructions for Demo1. We then discussed if we were going to continue to work on the code or demo what we have next week. |
| 5. Review action items to be completed after meeting | Kodi: Bring home the Camera and continue to attempt an even more accurate reading. <br> Ben: Upload team minutes document. <br> Brennen and Erick do not have anything to work on before next meeting. |
| 6. Schedule next meeting | (Maybe) Mon, March 15th 2021 during class |

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| 7. Recording secretary | Benjamin Selph |

## Meeting 15

| Meeting Date: **Wed, Mar 17** | **Start Time:** *11:00* **End Time:** 12:00<br>**Summary of Meeting**<br>Performance of DEMO1 deliverables |
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| 1. Attendance | All were in attendance |
| 2. Purpose of Meeting | To make final calibrations and demonstrate our code. |

| 3. Discuss work completed since last meeting. | Final tweaks to code were completed by all members. DEMO1 deliverables were tested and verified to be ready to demonstrate. The GitHub was organized and prepared for the final submission for code documentation by Erick. |
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| 4. Summarize work completed during meeting | The DEMO1 deliverables were demonstrated and graded. |
| 5. Review action items to be completed after meeting | Erick: Complete and organize the GitHub in preparation for final submission.<br>Ben: Team Minutes document updated.<br>All: Begin to look at team presentation that is due Monday. |
| 6. Schedule next meeting | Sunday, Mar 21st, via zoom |
| 7. Recording secretary | Benjamin Selph |

| Meeting Date:<br><br>Mon, 22 March | **Start Time:** *11:00* **End Time:** 11:50<br>**Summary of Meeting**<br>**Looked over deliverables for DEMO2 and discussed plans for spring break** |
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| 1. Attendance | All Members in attendance |

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| 2. Purpose of Meeting | To begin looking through DEMO2 instructions and decide how the spring break will be handled in terms of working on project |
| 3. Discuss work completed since last meeting. | The team documentation, reflections, and other needed deliverables for post DEMO1 were completed. |
| 4. Summarize work completed during meeting | We were able to get our plan moving forward sorted out since spring break was in the middle of the working period for this Demo. |
| 5. Review action items to be completed after meeting | Ben: Will begin to work on SI working extra before leaving for spring break<br>Brennen: Brennen will complete the base approach and circle code for operation.<br>Erick: Work on SI operation with Ben<br>Kodi: Work on modifying CV code for better angle accuracy and distance measurement |
| 6. Schedule next meeting | Wed, Mar 24th, during Class |
| 7. Recording secretary | Benjamin Selph |

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|---|---|
| **Meeting Date:**<br><br>***Wed,Mar 24th*** | **Start Time:** ***11:00*** **End Time:** 11:50<br>**Summary of Meeting**<br><br>Ben and Erick worked on system integration code. Brennen finished his base code for motor control. |
| 1. Attendance | All in attendance |
| 2. Purpose of Meeting | Touch base on progress and continue to work on the function of the robot. |
| 3. Discuss work completed since last meeting. | Brennen worked on the PID system. Kodi continued to work on the CV code. Ben and Erick worked on systems integration code. |

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| 4. Summarize work completed during meeting | Ben and Erick made good progress on data transfer code. Brennen finished his part of the code. Kodi helped Ben and Erick. |
| 5. Review action items to be completed after meeting | Ben: Work more on SI code as he will not be able to make the next two group meetings.<br>Brennen: Begin to comment aspects of code to make use for group easier.<br>Erick: will assist Ben<br>Kodi: will assist Ben and Erick |
| 6. Schedule next meeting | Fri, Mar 26th, during Class |
| 7. Recording secretary | Benjamin Selph |

| Meeting Date:<br><br>Fri, Mar 26th | Start Time: *11:00* End Time: 11:50<br>Summary of Meeting<br><br>Erick and Kodi finished SI code. |
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| 1. Attendance | Erick, Kodi, Brennen (Ben gone due to ROTC FTX) |
| 2. Purpose of Meeting | To finish all individual codes in preparation to integrate once everyone is back from spring break. |
| 3. Discuss work completed since last meeting. | Ben, Kodi and Erick worked on the code to transfer data correctly in preparation for all code to be integrated and testing to start. |
| 4. Summarize work completed during meeting | SI code was finished. |
| 5. Review action items to be completed after meeting | All group members will take a break from working on project over spring break. |

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| 6.    Schedule next meeting | Mon, APR3, during Class |
| 7. Recording secretary | Erick G. |

| Meeting Date: **Mon, APR 3rd** | **Start Time:  *11:00*  End Time:  11:50** **Summary of Meeting** Group reconvened and integrated all code to begin testing. |
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| 1. Attendance | All group members in attendance. |
| 2.  Purpose of Meeting | Integrate all of our code and begin to test the function for DEMO2 requirements. |
| 3. Discuss work completed since last meeting. | N/A |
| 4.    Summarize work completed during meeting | The code was combined and debugged in accordance to certain errors and syntax mess-ups that arose during integration. Then, the angle calculation, transfer, and adjustment was tested. |
| 5. Review action items to be completed after meeting | Ben: Will assist Brennen and Kodi in testing and debugging to get closer to being DEMO ready. Brennen: Will adjust motor control values to get the robot performance as good as possible. Erick: will assist Brennen in motor control. Kodi: will work together with Ben to make CV code give more accurate angles to the Arduino code. |
| 6.    Schedule next meeting | Wed, April 7th, during Class |
| 7. Recording secretary | Benjamin Selph |

| Meeting Date:<br><br>*Wed, April 7th* | **Start Time:** *11:00* **End Time:** 11:50<br>**Summary of Meeting**<br><br>Testing and adjusting of robot performance continues |
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| 1. Attendance | All members in attendance |
| 2. Purpose of Meeting | Continue to optimize robot performance in preparation for the DEMO. |
| 3. Discuss work completed since last meeting. | Kodi and Erick both went into the lab individually to test robot more and make code adjustments. |
| 4. Summarize work completed during meeting | The robot seemed to have a bit of angle error, which was compensated for and adjusted. Brennen tested ways to make the circle motion for Demo 2, part 2 faster and less wide. Erick assisted Brennen. |
| 5. Review action items to be completed after meeting | Ben: Continue to help test and debug.<br>Brennen: will continue to work on the robot motion with the assistance of Erick.<br>Erick: will assist Brennen in motor control.<br>Kodi: Will work on accuracy of angle and distance measurement |
| 6. Schedule next meeting | Fri, APR 9th, during class |
| 7. Recording secretary | Benjamin Selph |

| Meeting Date:<br><br>*Fri, Apr 9th* | **Start Time:** *11:00* **End Time:** 11:50<br>**Summary of Meeting**<br><br>Tested robustness of code and robot function. |
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| 1. Attendance | All Members in attendance. |
| 2. Purpose of Meeting | Testing robot functionality from larger distances between the camera and marker. |

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| 3. Discuss work completed since last meeting. | N/A |
| 4. Summarize work completed during meeting | The code was made more robust as the robot could function and have accurate and successful tests from distances 7+ feet. |
| 5. Review action items to be completed after meeting | Ben, Brennen and Kodi will meet Saturday to make robot operate faster. |
| 6. Schedule next meeting | Sat, Apr 10th, 3 pm |
| 7. Recording secretary | Benjamin Selph |

| Meeting Date: Sat, Apr 10th | Start Time: *11:00* End Time: 11:50 **Summary of Meeting** Robot speed was adjusted to make tests much faster in preparation for DEMO2 next week. |
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| 1. Attendance | Ben, Erick, Kodi (Brennen out of town.) |
| 2. Purpose of Meeting | To adjust motor code to increase search speed, circle speed and accuracy. |
| 3. Discuss work completed since last meeting. | Code optimization in preparation for DEMO2 |
| 4. Summarize work completed during meeting | The robot test speed from 5 ft marker distance was increased and test time was decreased by ~5 seconds. |

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| 5. Review action items to be completed after meeting | All members to begin working on code documentation and other deliverables for documentation turn in. |
| 6.  Schedule next meeting | Mon, APR 12th, during Class |
| 7.  Recording secretary | Benjamin Selph |

| **Meeting Date:**<br><br>**_Mon,APR 12th_** | **Start Time:**  _**11:00**_  **End Time:**  **11:50**<br>**Summary of Meeting**<br><br>Make final adjustments and tweaks to make robot performance as good as possible before demo. |
|---|---|
| 1. Attendance | All members in attendance. |
| 2.  Purpose of Meeting | To make robot as fast as possible without compromising accuracy. |
| 3. Discuss work completed since last meeting. | Documentation work, etc. |
| 4.  Summarize work completed during meeting | Brennen made approach speed after marker detection and the process of circling much faster, shaving another ~3 seconds off 5 ft tests. |
| 5. Review action items to be completed after meeting | All members prepare for Demo2 on Wednesday and finish code documentation and team minutes document for Ben. |
| 6.  Schedule next meeting | Wed, Apr 14th, during Class |
| 7.  Recording secretary | Benjamin Selph |

| Meeting Date:<br><br>**Wed, Apr 14th** | **Start Time:** *11:00* **End Time:** 11:50<br>**Summary of Meeting**<br><br>Demo2 performance. |
|---|---|
| 1. Attendance | All members in attendance |
| 2. Purpose of Meeting | To demonstrate our robot function for DEMO2. |
| 3. Discuss work completed since last meeting. | Team minutes documentation finished. Documentation close to finished. |
| 4. Summarize work completed during meeting | Robot demonstration and discussion of work plan moving forward. |
| 5. Review action items to be completed after meeting | Members will think about Final Demo requirements and enjoy E-Days. |
| 6. Schedule next meeting | Mon, April 19th, during Class |
| 7. Recording secretary | Benjamin Selph |