|  |
| --- |
|  |
| QE #68 (1.00 hrs) 7Mar19 **[T]**  Topic: Testing battery characteristics.    **Outcome(s):** Have verification of low level battery characteristics. |
| QE #69 (1.50 hrs) 7Mar19 **[GP&A]**  Topic: Team meeting (whole team)   1. Ian doesn’t really have anything to do, so he will take on more “project management” 2. Extra instructions on Moodle about report…    1. Put the name next to the paragraph that you wrote (in the report) 3. **Maybe meet with Scalzo for final review on 2Apr19** 4. EEs have lectures next two weeks 5. For reading encoder:    1. Measure how many points read over a known time period (don’t need to use full rotations)    2. Can use the index (every 90o) or other PPR rate 6. **Load Cell test Monday 11Apr19 (Meet walk room)** 7. GET CODE WORKING NOW   **Outcome(s):** Have new direction for the next few weeks, almost till the end. |
| QE #70 (1.50 hrs) 7Mar19 **[M]**  Topic: Changing method for getting readings from the encoder.    The new method involves taking digital measurements from the encoder over a set period via a while loop. Digital measurements because the encoder will put out a pulse at each PPR point (i.e. high and low). This isn’t a perfect method, but the Arduino will hopefully be fast enough to not miss a pulse.  The Mega 2560 has a 16 MHz clock speed which means that 16 million instructions can be executed every second. In today’s standards this is pretty low as even most phones are about a gigahertz.  **Outcome(s):** Have the new method for reading the encoder integrated. |
| QE #71 (0.00 hrs) 8Mar19 **[A]**  Topic: Outlining the code and getting the flow in order to remap efforts.     1. There doesn’t seem to be a way to change to setpoint other than redefining myPID()    1. Just define a new myPID() like his example of having 2 different sets of coeffiecents 2. The gear ratios still need to be fixed (Emily pointed out my errors) 3. The TestNumber will reset each test, when I need it to reset each time the device is powered on.    1. Move the intialization to the setup() 4. Need the functions IsDone() and StopMotor()    1. IsDone() should see if the test finished then envoke StopMotor(), which will stop the motor.    2. How to determine if the test is done?       1. Derivative?       2. Current less than 10% of previous load cell reading? 5. The labeling of sections needs to stand out more 6. **See Excel sheet of variable names (to check for usage)** 7. Research    1. [PID library](https://playground.arduino.cc/Code/PIDLibrary)    2. [String()](https://www.arduino.cc/reference/en/language/variables/data-types/stringobject/)   **Outcome(s):** Have an outline of the code and steps forward. |
| QE #72 (3.00 hrs) 8Mar19 **[M]**  Topic: Modifying the code in order to reduce redundancies and ensure alignment of functions.      **Outcome(s):** Have updated downward controls, display for numbers and strings, and overload handling. |
| QE #73 (1.00 hrs) 11Mar19 **[T]**  Topic: Testing the load cell. (Emily, Dylan, and Me)   1. The amplifier was connected to the Arduino and load cell. An external power source to the excitation pins. 2. I used a multimeter to check pin values for correct voltages 3. The test failed. (1.00 hrs)    1. The test failure was due to hooking up the external voltage    2. I did not realize at the time that the amplifier would supply 5 VDC    3. That 5 V isn’t the 10 V that the data sheet for the load cell specified…ask Thommy about it   **Outcome(s):** Now know that libraries are not perfect and this has prompted more testing. |
| QE #74 (3.00 hrs) 11Mar19 **[T]**  Topic: Testing load cell to trouble shoot.   1. SparkFun:    1. get\_units() – the argument denotes how many readings to take an average of    2. power\_down() – puts load cell in “sleep” mode    3. Use the SparkFun\_HX711\_KnownZeroStartup for using a preloaded tare value 2. Testing with SparkFun code (x2)    1. The starts off at ~6.5 lbs at a calibration factor of -300,000 (way over the example)    2. The weight fluctuates over time by a few tenths of a pound    3. [Raw 1.0 vs Raw 1.1] 3. Testing with the [Circuits4you](https://circuits4you.com/2016/11/25/hx711-arduino-load-cell/) code    1. No tare (x2) [Raw 2.0 vs Raw 2.1]    2. With tare (x2) [Raw 2.3 vs Raw 2.4] 4. Observations    1. Both codes used the average of 10 readings to 3 decimal places for each “measure”    2. All tests were over an approximate 5 minute period    3. At no point was the load cell touched or disturbed    4. Each test was different, and within each test the values varied       1. None of them worked       2. Using the tare() after 30 seconds worked for a few seconds 5. Next    1. Attempt to remove the excitation from the amplifier and use an external source.   **Outcome(s):** Have a next step to trouble shoot the load cell operation. |
| QE #75 (1.50 hrs) 12Mar19 **[S]**  Topic: Ethical legal issues lecture from Scalzo.   1. Maybe only need 3 classes to cover the topic and take the assessment for IEEE 2. Required to pick a topic and write a paper (3-5 pages) on modern topic related to ethics    1. Unless too amateur radio operators, not IEEE assessment    2. Analyze and suggest 3. 21Mar19 (Thursday) IEEE assessment on IEEE code (have to find on our own)    1. Binary multiplier to final grade 4. Define morals, ethics, and values    1. **Morals**       1. Principles of right and wrong, and decisions that derive from these principles       2. Principles derived from moral law and rules the govern behavior    2. **Ethics**       1. general nature of good and bad behaviors…obligations       2. Rules or standards governing conduct    3. **Values**       1. Something a person, or group, believes to be valuable 5. **Rule Based Ethics**    1. Universality—reasons for action that all people in society could accept    2. Transitivity—you would accept others applying the same decision to you    3. Only works on small scale (i.e. dx), but when scale up it becomes impossible. 6. **Conditional Rule Based Ethics**    1. Certain rules under which individual can break a rule 7. **Utilitarian Ethics**    1. The decision that produces the highest good for all people involved (mob rule) 8. Current Ethical Dilemmas    1. Racial       1. Civil Rights act of 1964 (et al.)       2. Affirmative Action (which contradicts above)       3. Nawaf being an idiot saying its ok to discriminate…it’s just because he’s not white       4. It’s just the not white people thinking its ok to discriminate because it suites them    2. Copyrighted resale 9. **Tort**—any wrongful act that does not involve a breach of contract and for which civil suit can be brought. 10. **Negligence**—not following **reasonable** rules and standards that apply and committed a wrongful act.     1. Manufacturer had a duty to follow reasonable rules     2. There was a breach of duty     3. Plaintiff was harmed     4. Breach caused the harm 11. **Liability**—something one owes; an obligation; debt 12. **Negligence Level**     1. Simple     2. Gross     3. Criminal 13. **Negligence claim brought for**     * 1. Design flaws       2. Manufacturing defects       3. Failing to warn user of safety hazards 14. INCLUDE ETHICS AND SAFETY IN FINAL DESIGN 15. **Strict liability**     1. Less strict; don’t have to prove negligence     2. Liable if        1. Product was dangerous or defective        2. Defect existed when it left your control        3. Defect caused harm        4. Harm is assignable to the defect 16. They don’t read privacy statements and were confused why what they said comes up of the internet   **Outcome(s):** Have another ethics course notes. |
| QE #76 (1.00 hrs) 12Mar19 **[M]**  Topic: Completing IsDone() and adding error code variables.       |  |  |  |  | | --- | --- | --- | --- | | Error**/**Warning Code | Meaning | Interlock Condition | Interlock Action | | E00 | Memory full | No available memory left | Store is available space, and drop the rest remaining data  Alert user  Log event | | E01 | Error with SD card | SD not usable currently | Do not allow device to be run  Alert user  Log event | | E02 | Not connected to load cell | No output from load cell (output range never reached) | Do not allow device to be run  Alert user  Log event | | E03 | Max weight exceeded | MaxForceAllowed\_SP reached | Do not allow device to be run  Alert user  Log event | | E04 | Time out (ran too long without load read) | MaxTimeAllowed\_SP reached | Do not allow device to be run  Alert user  Log event | | Ǝ01 | Invalid test | E00 or E01 or E03 | Alert user  Log event | | Ǝ04 | Free memory low | Memory is below (x)kB (10%) | Alert user  Log event |   **Outcome(s):** Have a more complete IsDone(). |
| QE #77 (1.50 hrs) 14Mar19 **[S]**  Topic: Ethical legal issues lecture from Scalzo.   1. **Handling Ethical Dilemmas**    1. **Whistleblower** – goes outside of company to government or press    2. When is it appropriate?       1. Only if harm to public.       2. Concerns must have been made (up to CEO) and have not gotten a response       3. Have documented evidence       4. Release of info will prevent harm    3. There will be consequences 2. **Case study for Report**    1. Gather info    2. ID stakeholders    3. Consider what ethical values are relevant to the situation (IEEE code)    4. Determine the best course of action 3. Required for final report    1. Failure analysis       1. Need to do and compile    2. On ethics “Ethical Implications”       1. Concerns for safety, security, etc.   **Outcome(s):** Have another ethics course notes and hard copy of safety certificate. |
| QE #78 (1.00 hrs) 17Mar19 **[T]**  Topic: Test SD breakout functionality by using Arduino example for initial check, then second code for writing to SD.   |  | | --- | | 15:33:26.333 ->  15:33:27.233 -> Initializing SD card...Wiring is correct and a card is present.  15:33:27.273 ->  15:33:27.273 -> Card type: SDHC  15:33:27.313 -> Clusters: 242304  15:33:27.353 -> Blocks x Cluster: 64  15:33:27.353 -> Total Blocks: 15507456  15:33:27.393 ->  15:33:27.393 -> Volume type is: FAT32  15:33:27.433 -> Volume size (Kb): 7753728  15:33:27.433 -> Volume size (Mb): 7572  15:33:27.473 -> Volume size (Gb): 7.39  15:33:27.513 ->  15:33:27.513 -> Files found on the card (name, date and size in bytes):  15:33:27.553 -> SYSTEM~1/ 2019-03-17 15:28:06  15:33:27.593 -> WPSETT~1.DAT 2019-03-17 15:28:06 12  15:33:27.633 -> INDEXE~1 2019-03-17 15:28:06 76 |     **Outcome(s):** Have required documentation of tested SD breakout system. |
| QE #79 (1.00 hrs) 17Mar19 **[T]**  Topic: Test display functionality.    **Outcome(s):** Have required documentation of tested display system. |
| QE #80 (1.00 hrs) 17Mar19 **[T]**  Topic: Test buttons.    **Outcome(s):** Have required documentation of tested buttons system. |
| QE #81 (1.00 hrs) 17Mar19 **[T]**  Topic: Test Arduino Mega 2560.    **Outcome(s):** Have required documentation of tested Arduino. |
| QE #82 (2.00 hrs) 18Mar19 **[R]**  Topic: Getting SD card memory value for error monitoring.   1. [SD Card- Read available space?](https://forum.arduino.cc/index.php?topic=139852.0)    1. Could check total volume of the card and then subtract the used space…NOOO    2. Some newer versions of SdFat have a free cluster function...ONLY UP TO 4 GB       1. Would have to add to SdVolume.cpp and save over downloaded version    3. “fat16lib” has a method using the SdFat.h, but I can’t get it to implement…    4. There is no object “vol” in any file…       1. There is a “vol” variable, but no object       2. Can’t find how to include SdFat.h to use .vol   Checking for free space may not a possibility.  **Outcome(s):** Have a good start for future research, but no time now. |
| QE #83 (1.50 hrs) 19Mar19 **[GP&A]**  Topic: Team meeting to get caught up and sign notebooks.   1. Present: All 2. Electircal:    1. Motor driver:       1. Pins: 3 digital    2. Encoder:       1. PPR is 2048       2. Pins: 1 digital, 2 power (5 total)          1. Signal A (connect)          2. Signal B (nope)          3. GND (common)          4. VDD (common)          5. Index (1 rotation) 3. DG: Don’t worry about accuracy over displacement 4. Maybe check with ME professors on load cell (Polarity, Lee, Scholgola, or Mark in lab) 5. MEs asking about design for the hook adapter…asking how to design the adapter to not be hard to work with 6. Fuck everything not needed.   **Outcome(s):** Have new direct and focuses for next actions. |
| QE #84 (0.50 hrs) 20Mar19 **[D]**  Topic: BTB #4.  **Outcome(s):** Have required documentation for BTB #4. |
|  |