

Team Meeting Minutes
Tuesday, June 15, 2016

1. Teams were made and we are working on the Trunk Bending Project
2. Decided on team name: Twisters
3. Team members:
 - a. Jennifer Downen
 - b. Husain Altaqui
 - c. Hai Yu
 - d. Tristan Higgins
4. Met with Instructor: Mike Maughan
5. Created team contract
6. Viewed last group's binder to see their progress
7. Viewed the project in the Design Suite and started understanding the design and what we need to complete
8. Meeting with Mike on Thursday, June 16, 2016 in the Design Suite to discuss our questions for our client meeting
9. Meeting with client on Monday, June 20, 2016 in the Design Suite to ask questions about the project
10. Goals for the next meeting:
 - a. Everyone come up with questions to ask client
 - b. Hai has the binder and will look through it
11. Problems to resolve:
 - a. We need more information about the project
 - i. Solution: view the binder, talk to client, and Joel Perry

Team/Instructor Meeting Minutes

- All members present
- Progress since last meeting:
 - Everyone brought questions to ask the client
- Problems since last meeting: none
- Best way to capture interview
 - Notes, summarize, can record if we want
- Shared individual questions with Mike
- Client wants the device to work by the end of summer, but it will need more stuff to be safe
- Make sure to prepare over the weekend
- Send list of questions to client in agenda format
- Create gant chart for project plan

Team Meeting Minutes (after Instructor/Team Meeting)

- Next meeting time:
 - Friday, June 17, 2016 at 9:00 AM in Design Suite
- Team Contract signed
- Responsibilities for the next meeting:
 - Tristan will view the first quarter of the last group's binder and will have it done by the meeting the follow day (6-17)
 - Each of us will highly understand a quarter of the binder and have a broad understanding of the rest of the material
 - Completed by 6-20
 - Everyone will make a list of their questions and e-mail them to Jennifer to compile by 6-17
 - Jennifer will send compiled questions to client by 6-17
- Goals for the next meeting:
 - Dig deeper into the design of the device
 - Make a list of finished information, needs completed, parts to order, and questions

Team Meeting Minutes
Friday, June 17, 2016

1. Tristan finished his reading and gave an overview of his reading
2. Everyone send questions to Jennifer by the end of today
3. Jennifer will send questions by close of business
4. List of parts
 - a. 5V power supply
 - b. 2 u-joints
 - c. 1-turn potentiometer
5. Needs completed
 - a. Replace u-joint
 - b. Add another u-joint
 - c. Move and replace potentiometer
 - d. Add two more potentiometers
 - e. Wire torque sensor
 - f. Add 5V power supply for sensors
 - g. Reprint spools for BNC housing (have files)
 - h. Add emergency stops and fuses
 - i. Improve head/neck contrast
 - j. Finish the DFMEA and improve device for preventative measures
 - k. Improve measurement system for lateral displacement
 - l. Test product
 - m. Use standard bolts (redrill holes)
 - n. Look at threads on base
6. Questions
 - a. The objectives in the Twister Project Description says 3 potentiometers, there is currently two potentiometers, where would you like the second and third one? (Tristan describe location)
 - i. What are they being used for?
7. We are going to use an inventory of parts from the bought list.
8. Next meeting:
 - a. Instructor meeting at 9:00 am with Mike Maughan??
 - b. Client Interview on Monday, June 20, 2016 at 1:15 in Design Suite
9. Hussain has book on Friday, June 17, 2016. Jennifer has book Saturday, June 18. And Hai has the binder on Sunday, June 19, 2016.
10. Goals for next meeting:
 - a. Send questions to Jennifer
 - b. Jennifer will print questions
 - c. Everyone has viewed binder
 - d. E-mail Mike about Monday instructor meeting (Jennifer)

Client Interview Minutes

Monday, June 20, 2016

Design Suite at 1:15 PM-2:00 PM

- All team members present prior to meeting to finish assembling questions
- Instructor , Mike Maughan, was early and reviewed our client interview questions
- Client, Rajal Cohen, present
 - Introductions were made by all parties
- Asked our questions (listed and answered below) to Dr. Cohen
- Dr. Cohen asked questions
- Next responsibilities:
 - Jennifer: Send follow up e-mail to Dr. Cohen
 - Jennifer: Send weekly updates to Dr. Cohen

Team Meeting Minutes

Monday, June 20, 2016

Design Suite at 2:00 PM – 3:30 PM

1. We reviewed the available parts that were bought by the previous team. They bought most of the necessary parts. We were unsure of the type of circuitry needed for the sensors and computer.
2. Everyone was assigned to types of circuits to research for the next meeting.
 - a. Each person needs to explain what their circuitry does and what parts are needed to make it work.
3. There were a couple questions formed.
 - a. Does Dr. Cohen want a different head restraint or is she more worried about how it attached to the bar?
 - b. Does the machine need a force transducer for the side to side bending experiments? What is a force transducer?
 - c. Would Dr. Cohen prefer sliding bars where the side to side bending arms are located?
4. List of actions needed:
 - a. Replace two u-joints so they have less free, unnecessary motion
 - b. Place an emergency stop button
5. Responsibilities for the next meeting:
 - a. Research certain areas to define the uses and needed materials
 - i. Hai
 1. Voltage regulators
 2. Electromagnetic circuitry
 - ii. Tristin
 1. 10-turn vs 1-turn potentiometer
 2. Rollers (bearings) for square arms
 - iii. Husain
 1. Needle bearing joints
 2. Torque Sensors
 - iv. Jennifer
 1. Force transducers
 2. DC motors
 - b. Tristin: get credit card purchase forms and start understanding them
 - c. Jennifer: E-mail Brian Hanson about the best places to order parts
6. Next meeting
 - a. Tuesday, June 21 in the Design Suite at 11:30 AM

Team Meeting Minutes
Tuesday, June 21, 2016
Design Suite from 11:45-2:00

1. All team members present
2. Each member gave an update about their research
 - a. Hai
 - i. The voltage regulator connects to a strain gauge and a torque sensor. It can convert 24 V to 5 V. The past team said the regulator did not work. They suggested a voltage converter, but we are not certain why it needs to be a converter. The past team suggested a MuRata DC/DC converter, but it only goes down to 7 V.
 - ii. The electromagnets wok for their current use.
 - b. Hussain
 - i. Torque sensors have a strain gauge built into them. Tim thought their needed to be a strain gauge on the bottom of the device. Can it be located in a torque sensor?
 - ii. The needle bearing u-joints on the plate are too low quality and move too much. We need higher quality bearings. We need to talk to Tim about acceptable tolerances.
 - c. Tristin
 - i. A 10-turn potentiometer is more accurate than a 1-turn potentiometer. The past team started with a 10-turn then decided a 1-turn was better. We are not certain why. We need to talk to Brian Hanson and Jacqueline (one of the of previous team members.) We are currently thinking of using the 10-turn potentiometer for all three needed locations.
 - ii. We want to make the bender bars easier to adjust. Flange rollers are \$40 each and too expensive since we need 8. V-rollers are a better choice. They are \$5 each. We need to check the machine for the rollers and look up angle iron for 14 inches of iron.
 - d. Jennifer
 - i. Force transducers provide an output quantity determined by the parameter being measured; in this case, it is force. The strain gauges are considered a force transducer.
 - ii. The DC motors that the past team bought are acceptable. We need to test at 6.0 V. Simpler circuits cannot control the motor speed smoothly at low levels. As the desired speed decreases, the torque of the motor decreases. It may randomly stop at low speeds or not start at all. We shouldn't need to create circuit because the DC motor should already work.
3. Parts List
 - a. Need:
 - i. 3 potentiometers
 - ii. 1 or 2 torque sensors
 - iii. 2 strain gauges (potentially)
 - iv. 2 u-joint needle bearings (high quality)
 - v. 8 V-Rollers

- vi. 14 inches of angle iron
 - vii. 3 printed spools
 - b. Have
 - i. 3 potentiometers of differing sizes
 - ii. 2 torque sensors
 - iii. 2 u-joint needle bearings (low quality)
- 4. Next Meeting: Wednesday, June 22, 2016 in Design Suite at 11:30
- 5. Responsibilities for next meeting
 - a. Jennifer
 - i. E-mail Tim about tolerances, strain gauges, what sensors produce interfering waves
 - ii. E-mail Jacqueline about potentiometers and converters
 - iii. E-mail Brian about storage room, supplies, and meeting without team
 - iv. Create Word document of meeting minutes
 - v. Create Word document of the agenda for the next meeting
 - vi. View past project wikipages to find drawings of the harness attachment assembly
 - b. Hai
 - i. Research emergency button
 - ii. Bring part numbers and web links for voltage converters
 - c. Hussain
 - i. Research plate options to block waves
 - ii. Bring part numbers and web links for torque sensor and needle bearing u-joints
 - d. Tristin
 - i. Create drawings for bender bar roller design
 - ii. Bring part numbers and web links for v-rollers, angle iron, 10-turn potentiometer
 - e. Everyone
 - i. Start creating individual action lists

Team Meeting Minutes
Wednesday, June 22, 2016
Design Suite at 11:30-2:00

1. Old Business

- a. Jennifer-Wikpage and shared drive do not have drawings of harness attachment
- b. Hai-suggests we buy a different button that has all of the wiring attached. On Amazon, it will be around \$10. Send link to Tristin
- c. Hussain
 - i. Plate will be used to block electromagnetic waves-it will made into a box
 - 1. Hussain will send information for plate to Tristin
- d. Tristin
 - i. Found a set of wheel for bender bar roller (\$23 for 8) $\frac{3}{4}$ " whole shaft size and 3
 - ii. Changing the rounded v-bar to a right angle, non-rounded v-bar
 - iii. Going to buy a couple springs and bolts to press the bearings against the v-bar iron rod

2. Parts List

- a. Need:
 - i. 3 potentiometers 10-turn Tristin
 - ii. 2 strain gauges (potentially) Hussain
 - iii. 2 u-joint needle bearings (high quality) Jennifer
 - iv. 8 V-Rollers Tristin
 - v. 12 ft of angle iron Tristin
 - vi. 3 printed spools Jennifer
 - vii. 4 springs Tristin
 - viii. 4 bolts (Machine shop)
 - ix. 2 computer wires Hai
 - x. 1 5 Volt Power supply Hai
- b. Have
 - i. 3 potentiometers of differing sizes
 - ii. 2 torque sensors
 - iii. 2 u-joint needle bearings (low quality)

3. New Business

- a. Talked to Brian Hanson
 - i. Suggested
 - 1. 10-turn potentiometer
 - 2. 5 volt separate power supply-use power supply from Amazon
 - 3. Buy computer cable from Amazon
 - 4. U-joints-sent links for plastic joints
 - a. We can make our own at U of I
 - ii. Gave us access to storage room
 - iii. He said he will help us with wiring and testing connections
- b. Action Items
 - i. Replace u-joints
 - ii. Add 2 potentiometer to the bender arms

1. Code
 - iii. Base potentiometer code and measurements
 - iv. Add a 5V power supply
 - v. Reprint spools
 1. Potentially machine spools
 - vi. Reprint potentiometer housing
 - vii. Create a plate for the DC motor
 - viii. Program the strain gauges
 1. Add strain gauges
 - ix. Add V-rollers to bender bars
 1. Design bender bars
 2. Present to Cohen
 - x. Design and send model Cohen for second bar
 - xi. Add emergency stop button including frame
 - xii. Remove extra material from toggle clamps
 - c. Problem Statement
 - i. The previous team assembled and modified the structure to be relevant for the trunk bending experiments. They created an interface software to collect data, upgraded the hardware, and built harnesses. We are bring the machine into an operational state by using higher quality parts, completing circuitry, making the machine more user-friendly, adding safety features, and testing and collecting data from the final product.
4. Next meeting: Thursday, June 23, 2016 at Design Suite at 11:30
5. Responsibilities due BEFORE next meeting
 - a. Everyone
 - i. Send part links to Tristin. Above parts has assigned member
 - b. Jennifer
 - i. Make agenda for next meeting
 - ii. E-mail Molly and CC Cohen
 - iii. E-mail Tim and Cohen
 - c. Tristan
 - i. Budget sheets
 - ii. Creating excel sheet of budget sheet
 - d. Hussain
 - i. Figure out the thickness for the plate needed to prevent electromagnetic waves

Team Meeting Minutes

Thursday, June 23, 2016

Design Suite from 11:30 AM -12:30 PM

1. Old Business
 - a. Finalized the parts list
 - i. Sent it to Dr. Cohen for approval
2. New Business
 - a. Responsibilities for meeting
 - i. Tristin and Hussain-create designs for moving bending arms
 - ii. Jennifer-create designs for second vertical bar attachment
 - b. Next meeting:
 - i. Friday, June 24, 2016 at 9:00 AM in Design Suite

Team Meeting Minutes

Friday, June 24, 2016

Gaus Johnson Computer Lab at 9:00 AM-

1. Old business
 - a. Review e-mails from Dr. Cohen and Eric Wolbrecht about budget list
2. New Business
 - a. Find a string potentiometer quote and send Dr. Cohen an updated budget list
 - b. Everyone work on assigned task during meeting
 - i. Hai-Starting to put together the portfolio
 - ii. Hussain-Look at the requirements for the wikipage and start putting it together
 - iii. Jennifer-Make a schedule for the summer/fall semesters, Facetime Mike Maughan to prepare for meeting on Monday
 - iv. Tristin-work on designs for sliding bending arms
 - c. Tasks to be completed
 - i. Client Interview notes
 - ii. Logbooks
 - d. Next meeting:
 - i. Instructor Meeting
 - ii. Monday, June 27, 2016 at 9:00 AM in the Design Suite
 - e. Responsibilities for next meeting

Instructor Meeting Minutes

Monday, June 27, 2018

Design Suite at 9:00 AM-9:15 AM

Facetiming Dr. Maughan

- Gave updates about our progress
- Dr. Maughan suggested we stop and complete
 - Action list so we can properly complete specification and Gantt Chart
 - We are sending him the Gantt Chart, action list, and specifications to Dr. Maughan to review by Friday, July 1.
 - We will send Dr. Cohen the action list and specifications on Tuesday, July 5 after they are review by Dr. Maughan

Team Meeting Minutes
Monday, June 27, 2016
Design Suite at 9:15 AM-9:30 AM

1. Create action list
 - a. String potentiometers
 - i. Set up circuitry to the power supply and computer
 - ii. Program to the software interface created last year
 - iii. Test the string potentiometer for accuracy with Brian Hanson
 - b. Strain gauge
 - i. Program strain gauge through the torque sensor
 - ii. Test with Brian Hanson
 - c. Electromagnets
 - i. Set up circuits to the power supply and computer
 - ii. Test with Brian Hanson
 - d. New pulleys and belt for the bottom potentiometer
 - i. Replace the older belt and pulleys with the new ones
 - ii. Test
 - e. Power supply
 - i. Correctly attach the power supply to the computer
 - ii. Correctly attach all sensors
 - iii. Test
 - f. Neck bar u-joints
 - i. Replace old u-joints
 - ii. Test
 - g. Torque sensors
 - i. Attach circuitry to power supply
 - ii. Program sensor to software interface created last year
 - h. Attachments for second restraint bar
 - i. Create drawings to get approved by Dr. Cohen
 - ii. Buy parts
 - iii. Build attachment
 - iv. Test
 - i. Add roller system to lateral bars
 - i. Create drawings to get approved by Dr. Cohen
 - ii. Buy parts
 - iii. Build attachment
 - iv. Test
 - j. DC Motor
 - i. Set up circuitry to power supply
 - ii. Program with software interface
 - iii. Test
 - k. Emergency stop
 - i. Create drawings for the emergency stop holder to get approval from Dr. Cohen
 - ii. Build attachment

- iii. Test
- l. Point of max rotation
 - i. Pitch idea to Dr. Cohen
 - ii. Create drawings of idea
 - iii. Buy parts
 - iv. Build attachment
 - v. Set up circuitry to power supply
 - vi. Program to the computer
- m. Second harness holder
 - i. Get necessary dimensions from CMM or Laser Scanner
 - ii. Create parts, assemblies, and drawings in SolidWorks
 - iii. Build attachment using Machine Shop materials
- 2. Set meeting times for the week
 - a. Tuesday through Thursday at 11:00 AM in the Design Suite
- 3. Goals for the week
 - a. Task list
 - i. Send to Dr. Maughan by Friday, July 1 for review
 - ii. Send to Dr. Cohen next Tuesday, July 5
 - b. Gantt Chart through the Fall 2016
 - i. Created by Hai Yu
 - ii. Completed by Friday, July 1st so Dr. Maughan can review prior to portfolio checks
 - c. Wikipage
 - i. Created by Husain Altaqui
 - ii. Completed by Friday, July 1st so Dr. Maughan can review prior to portfolio checks
 - d. Portfolio
 - i. Created by Hai Yu
 - ii. Completed rough draft by Tuesday, July 5th so the team can review for the due date on Wednesday
 - e. Logbooks
 - i. Created and completed by everyone by Wednesday, July 5th for the review
 - f. Drawings
 - i. Hussain and Tristin working on the lateral bender bar moving redesign
 - ii. Jennifer working on the second restraint bar redesign

Team Meeting Minutes

Tuesday, June 28, 2016

Design Suite at 11:00 AM-12:00 PM

1. Hussain and Tristin will give updates about their drawings for the lateral bender bars
 - a. The needed calculations for the amount of bend in the frame was complete
 - i. The amount of bending is so small that it won't be a concern
2. Jennifer will give updates about drawing for the second restraint bar
 - a. A metal t-bar would be better than a PVC pipe
 - b. Tristin can weld the bar to the pipe
3. Hai has completed the Gantt Chart through Summer 2016 and will finish the Fall 2016 portion by Thursday
4. Create specification sheet (see Specification sheet in the binder and shared files)
5. Everyone will continue to work on their assigned projects for the next meeting
6. Verify next meeting time
 - a. Wednesday, June 29, 2016

Team Meeting Minutes
Wednesday, July 6, 2016
Design Suite at 11:00-1:00 PM

1. Opened the interface and the DC motor Arduino code. We learned how to run the code through the interface. It did not seem like the shaft attached the gear was moving. We took apart the gear box to analyze the gears. The gear was moving, but very slowly. The code is supposed to turn the plate in two directions over a range of degrees, but we could not make it work. The gear would only spin in one direction indefinitely.
 - a. We will analyze the code further on Wednesday, July 7, 2016 at our next meeting.
2. Hussain found new U-joints and timing belt to replace the parts we ordered that don't fit our needs.
3. Meeting with Dr. Cohen
 - a. We met with Dr. Cohen at 2:30 to give her an update on our progress and show her two new designs. She liked the roller bearing bars design, but did not feel the second lateral bar attachment was fully necessary. The second lateral bar attachment will prevent less bending of the bar attachment metal which broke last year. We will add the attachment, but it is toward the bottom of the priority list.
4. Next meeting time:
 - a. Wednesday, July 7, 2016
 - b. Design Suite at 11:00
5. Goals for the next meeting
 - a. Analyze code further
 - b. Meet with Dr. Cohen about designs
 - c. Work on lateral bar attachment on SolidWorks

Team Meeting Minutes
Thursday, July 7, 2016
Design Suite at 11:00-1:00 PM

1. Tristin and Hai took measurements of the second lateral bar attachment and made the assembly of the harness attachment in SolidWorks
2. Jennifer and Hussain started analyzing the code made by the past team, started connecting the electromagnet to the solid state relay, borrowed a breadboard from Mentor Brian Hanson, Brian answer questions about multiple attachments to one pin on the Arduino, E-mailed the past team about their code and asked multiple electrical engineering students to help analyze the DC motor code.
3. Next Meeting
 - a. Thursday, July 8, 2016
 - b. Design Suite at 11:00
4. Goals for the next meeting
 - a. Finish circuits
 - b. Start making lateral bar attachment in Master Cam
 - c. Machine Shop work on Monday, July 11 at 1:30 PM

Team Meeting Minutes
Thursday, July 8, 2016
Design Suite at 11:00-1:00 PM

1. Attached all circuits
2. Started making lateral bar attachments in Master Cam
3. Next Meeting
 - a. Instructor Meeting
 - i. Monday, July 11, 2016
 - ii. Design Suite at 9:00 AM
 - b. Team Meeting
 - i. Monday, July 11, 2016
 - ii. Machine Shop at 1:30 PM
 - c. Dr. Cohen Lab Tour
 - i. Tuesday, July 12, 2016
 - ii. Forney Hall Basement at 1:00 PM
4. Goals for the next meeting
 - a. Have Brian Hanson view circuits
 - b. Fully understand the DC motor code (we can make it run)
 - c. Finish MasterCam drawing and machine the second lateral bar attachment
 - d. Complete circuitry for emergency stop button
 - e. Start programming the potentiometer and torque sensors
 - f. Get logbook and portfolio back from Dr. Maughan so we can update them
 - g. Gantt Chart
 - h. Sign up for a machine time

Team Meeting Agenda

Monday, July 11, 2016 at 1:30-4:00

1. Hai and Jennifer created to drilled and tapped screws for the second lateral bar attachment
2. Tristin and Hussain created the second harness attachment on the CNC mills

Client Meeting Minutes

Tuesday, July 12, 2016 at 1:00 at Dr. Cohen's lab in Forney Hall

1. We need to attach 5 specific wires to computer each wire for each output sensor.
2. We cannot "wheel" the apparatus around the inside lab because there is a doorway that is a couple inches too long.
3. Do not need to make interface display graphs since the motion monitor does it already

Team Meeting Minutes

Tuesday, July 12, 2016 at 11:00-1:00

1. Goals for the week
 - a. Hai
 - i. We need to create a part to hold the emergency stop button
 - ii. Sign up for a shop time for 7/18/2016
 - b. Jennifer and Hussain
 - i. We need to test circuits and we will need help from Brian Hanson
 - ii. We need to code the potentiometer
 - iii. Fix DC motor code
 - c. Tristin
 - i. Reorder parts
 - ii. Code electromagnets
 - iii. Weld second lateral bar attachment
 - d. Jennifer
 - i. Weld second lateral bar attachment
2. Items to add to Action List
 - a. We need to make the frame more stable by creating 2 different designs for approval
 - i. This will occur next semester
3. Completed tasks
 - a. Jennifer
 - i. E-mailed Brian about testing circuits
 - b. Hussain and Jennifer
 - i. Found 2 codes for potentiometers
 - c. Tristin
 - i. Looked at available codes for electromagnets
 - d. Hai
 - i. Made a SolidWorks model for emergency stop
 - e. **We believe we need to attach the potentiometer in the base for the DC motor to work correctly

Meeting with Brian Hanson
Wednesday, July 13, 2016 at 1:00-2:15

1. Brian's suggestions for circuits
 - **We had all the sensors, DC motor, and power supplies wired.
 - a. VCC and GND to 24V on relay to electromagnets
 - i. Remove current wires attached to 24V
 - b. String potentiometer signal wires connect to analog input not pins
 - i. Check volts for power systems
 - ii. Power with oscilloscope and use analog input
 - iii. Doesn't need power supply
 - c. Set 5V limit
 - i. Attach 5V to Arduino +V and GND
 - d. We can attach the Arduino to 5V power supply; thus, we wouldn't need a computer
 - e. Computer connection
 - i. Needs an outside GND and inside power
 - ii. Check how much they can handle
 - f. Use oscilloscope to check machine in Dr. Cohen's office
 - i. We need someone from Dr. Cohen's office who knows about their hookups.
 - g. Add 5th wire for stop
 - h. **Brian suggests removing all attachments and starting with the electromagnets testing and coding.

Team Meeting Minutes

Wednesday, July 13, 2016 at 11:00

1. Test circuits with Brian at 12:30
2. Tristin
 - a. Analyzed DC Motor Code and found differences in the code in the shared drive and past team portfolio code
 - b. Found that we do not need to attach electromagnets to output sensors for Cohen's computers
3. Hai
 - a. He is almost completed with the emergency stop button design
4. Jennifer
 - a. She had an electrical engineering major (Joe Stanley) look at our Arduino code and he sent a couple changes for the DC motor code. Joe is still looking at the code.
 - b. We found that Joe's code still has some bugs in it.
5. Questions
 - a. Do we have electromagnets code?
 - b. Can we use the computer attachment wires by cutting them in half (giving us 6 total)?

Team Meeting Minutes

Thursday, July 14, 2016 at 1:00-2:30

1. Hussain was sick and was unable to make it to the meeting
2. Tristin
 - a. Will order parts tomorrow after Jennifer talks to Ryan about welding the pulley parts
3. Each team member
 - a. Removed electrical parts and reattach electromagnets only
 - b. Test the DC motor code
4. Brian helped at 12:45
 - a. He checked our electromagnet rewiring
 - i. The relay was fried. Tomorrow, Hari, an electrical engineer, is helping fix our circuits and is providing a temporary relay.
5. Jennifer left at 1:30

Team Meeting Minutes
Friday, July 15, 2016 at 9:00-3:00

9:00-9:30

1. Jennifer
 - a. Called Motion Monitor about BNC connections and found that the machine can handle 5V sensors
2. Tristin
 - a. He played with his personal Arduino last night to try to alternate between two lights blinking. He was trying to simulate the electromagnets.

9:30-12:00

3. We worked with Brian Hanson and Hari to fix our circuits.
 - a. Hari gave us a relay!
4. We tested our Arduino and Visual Studio code after fixing the circuits and we couldn't get it to work!

2:00-3:00

Brian asked his computer scientist friend, Brian Mumford, to help us with our Arduino and Visual Studio codes. The Visual Studio code was rough and missing coding for the electromagnets. Brandon said he would look at the code over the weekend.

Instructor Meeting Minutes

Monday, July 18, 2016 at 9:00-9:15

1. Our updates

- a. Welding over the weekend did not go well. We will need to get help from someone in the Machine Shop.
- b. Lab meeting with Dr. Cohen was very informational. We found out that we needed to attach BNC connectors to each sensor that needs to output data (2 torque sensors and 2 string potentiometers.)
- c. Checked circuits with Brian and he had us remove all the sensors and start with the electromagnet circuits and coding. We couldn't get the codes to run the electromagnets. Brian asked Hari to help us fix the circuits on Friday.
- d. Hari helped us fix our circuits and made sure our wires were correctly covered and grounded. He gave us a relay.
- e. We tested the code and it still didn't work so Brian asked Brandon to help us fix the code. He is going to help us fix the code.

2. Mike Maughan suggestions

- a. He is happy that we ran into some problems because it means we were making progress.
- b. We need to update our Gantt Chart.
- c. We can have multiple binders
 - i. User manual for Dr. Cohen
 - ii. Second binder for project electrical
 - iii. Third binder for mechanical
- d. We do not have to follow the order of the rubric for the portfolio

Team Meeting Minutes

Monday, July 18, 2016 at 11:00-2:30

1. Work in the Machine Shop
 - a. Hai—Emergency stop holder
 - i. Hai finished the part and mounted it on the apparatus
 - b. Tristin—Belt tension device for timing belt
 - i. Tristin finished the part and mounted on the base plate on the apparatus
 - c. Jennifer and Hussain—Pulley part
 - i. Jennifer helped create the design and start the part
 - ii. Hussain finished the part and mounted it
 - d. Hussain made a drawing for the pulley and shaft plug and made an asse
2. Jennifer had to leave at 12:45

Team Meeting Agenda
Tuesday, July 19, 2016 at 11:00

1. Tristin and Hussain wrote the potentiometer code which needed updated gear ratio calculations
 - a. They need the ordered timing belt to finish testing
2. Hai completed the circuits for the emergency stop
3. Jennifer made a SolidWorks drawing of the parts and assembly for the second lateral bar attachment so the Facilities Machine Shop could weld the parts together.
 - a. Dropped off the parts at Facilities and picked them up later that day

Team Meeting Minutes

Wednesday, July 20, 2016 at 11:00-4:00

1. Jennifer talked to Brian about progress made on Visual Studio code (Brandon Mumford in the computer scientist working on it.)
 - a. If code is ready, we will start testing—Code is NOT ready
 - b. Brian talked to Brandon and Brandon said he will recreate the Visual Studio code since the code is hard to follow and not commented.
2. Code the string potentiometers and the torque sensors to start and stop up starting the Visual Studio Interface.
 - a. Brian suggests that we do not had the start and stop to the Visual Studio code because we are weaker in programming. It would be helpful by not necessary.
3. All team members
 - a. We added all the necessary wiring for the sensors. The individual wire connections were given to us from the Gaus-Johnson Basement supplies.
4. Jennifer left at 3:00
5. Hai, Tristin, and Hussain finished the BNC connection splicing

Team Meeting Minutes

Thursday, July 21, 2016 at 11:00-2:00

1. Test sensors with Brian's oscilloscope
 - a. Brian brought us an oscilloscope
 - b. We tested all the sensors.
 - i. The string potentiometers worked.
 - ii. The torque sensor had a loud of "noise" on the oscilloscope.
 1. Tristin called Futek (the torque sensor company.) They suggested using an amplifier or a better oscilloscope because there are no electrical parts that interfere inside the torque sensor.
2. Split up assignments to finish the portfolio (assignments are list below)
 - a. They are due Friday, July 29, 2016 so Hai has time to assemble the binder.
 - b. Hussain
 - i. Update the project webpage
 - ii. Project Learning Write-Up—Torque Sensors, Needle bearing U-joints
 - iii. Render—wheels for the bender bar v-bearing design, pulley plug assembly
 - iv. Drawings and Models—harness "bendy" attachment (with assembly) and shaft plug and assembly
 - v. Freehand sketches—wheels, harness "bendy" attachment
 - c. Tristin
 - i. Project Learning Write-Up—string potentiometers
 - ii. Renders—V-bearing slider design and belt tension device for timing belt
 - iii. Update the budget-view past team budget
 - iv. Add more comments to TK code
 - v. Freehand sketches—the same parts you are rendering
 - d. Hai
 - i. Project Learning Write-Up-emergency stop button, 5V power supply
 - ii. Update design goals
 - iii. Update system diagrams
 - iv. Render—Emergency stop button
 - v. Freehand sketch-Emergency stop button
 - vi. Update drawing package
 - vii. Expand the electrical package and assemblies (we will work on together)
 - viii. Update the technical data sheet to include
 1. Torque sensor
 2. String potentiometers
 3. Potentiometers
 4. Maxon DC motors
 5. 24V power supply
 6. 5V power supply
 - ix. Bill of materials
 - x. Update project timeline (Gantt Chart)
 - xi. Update file management
 - e. Jennifer
 - i. Update team meeting minutes

- ii. Compile further e-mails with professors and client
- iii. Project Learning Write-Up—Welding/Soldering, DC motors, client
- iv. Update specifications
 - v. Render—second lateral bar attachment with torque sensor
- vi. Freehand sketch-pulley plug, second lateral bar attachment and diameters

Team Meeting Minutes
Friday, July 22, 2016 at 9:00-11:00

1. Jennifer
 - a. E-mail Dr. Cohen about Design Review meeting and give update
 - b. Minutes/Agendas update
 - c. Send portfolio assignments
 - d. Update the second lateral bar attachment to include a torque sensor (see 2.b below).
2. Tristin and Hai—figure out if and how to attach the bottom (base torque sensor)
 - a. The torque sensor does not attach to the base which makes sense since it would prevent movement of the base. It would also be hard to attach to the center of the base since that is where the motor is also attached.
 - b. Tristin found some pictures in the past portfolio under the original Twister section. The torque sensor was attached to the second lateral bar attachment. The picture's header said it was optional, but we know that Dr. Cohen wants it. This part now belongs under Jennifer's second lateral bar attachment.
 - c. This means Tristin and Hai no longer need to work on it. Hai will start working on the portfolio and Tristin is going to help Hussain design a new "bendy" harness attachment.
3. Hussain—create drawings for the pulley plug assembly and the "bendy" harness attachment

Instructor Meeting Agenda
Monday, July 25, 2016 at 9:00

1. What is the “Data Analysis” for the portfolio?
 - a. Statistical Analysis and comparisons
2. What is the “Engineering Model”?
 - i. Math models not SolidWorks models
 - ii. Place renders in drawing package
 - b. Where do we put the TK calculations?
 - i. Under math models
3. What do we need to include for the “Project Webpage Design”?
 - a. Don’t put a direct copy of the wikipedia
 - b. Put the link in the page
4. There are multiple documents about Design Review. Which have the best information?
 - a. Detailed Design Review
5. Dr. Maughan gave a detailed review of Gantt Charts

Tuesday 26

Wednesday 27

Thursday 28, July 2016

Team Meeting Agenda/Minutes

- Finish assigned portfolio assignments (see minutes for 7/21) by Friday, July 29, 2016
- Next team meeting Friday, July 29, 2016
 - Brandon Mumford to go over code
 - Design Review assignments and prep

Team Meeting Minutes

Friday, July 29, 2016 at 9:00 AM-11:30 AM

- 9:00-11:00 Brandon Mumford
 - Brandon asked questions about the Visual Studio Code and Arduino Code
 - The deadline was pushed back from Monday to the beginning of the Fall Semester (8/22)
 - He hopes to have it done earlier
- 11:00-11:30 Assign Design Review plans for the weekend
 - Everyone-Project Learning Summaries
 - Everyone-Design Alternative with renders
 - Tristin-Cost
 - Include total project cost and for the summer
 - Hai-Project Schedule dates (not gantt chart)
 - Jennifer-Potential Problems
 - How will they be managed?
 - Hussain-Potential Risks
 - How will they be managed?
 - There is a shared drive power point on Google so we can all add information
 - Jennifer is formatting
 - Have all information on PowerPoint on Sunday by 6 PM so Jennifer can format
 - Complete Design Review PowerPoint by Monday for Instructor Meeting
 - Perform presentation during team meeting on Monday

Instructor Meeting Agenda
Monday, August 1, 2016
Design Suite at 9:10-9:25

- Give update about previous week
 - Portfolio prep
 - Machine Shop work
 - Design Review prep
- Have Dr. Maughan review Design Review PowerPoint
 - Include more graphics and pictures
 - Use less words
 - Provide background information
 - Clarify budget

Team Meeting Minutes
Monday, August 1 2016
Design Suite at 3:00

- Make changes to Design Review PowerPoint-Jennifer
- Prepare speaking parts-Everyone
- Clean up work space in Design Suite to prepare for Snapshot-Hai, Tristin, Husain
 - We will need to do further cleaning
- Next meeting:
 - Team Meeting: Tuesday, August 2, 2016 at 11:00 in Design Suite
 - Design Review: Tuesday, August 2, 2016 at 11:30 in GJ 112

Design Review Minutes
Tuesday, August 2, 2016
GJ 112 at 11:30

- Present
 - Dr. Maughan
 - Dr. Cohen
 - Hunter Fillmore
 - Alex Olsen
 - Dr. Beyerlein (at the end of the presentation)
- Suggestions from Audience
 - Include mechanical stop for electromagnets
 - Include an extra power supply in case the power goes out
 - Learn the coding that Brandon Morford is doing in case he doesn't finish the code
 - What is our plan B?
- Overall
 - They liked our plan to move to Dr. Cohen's lab by October
- Provided Feedback sent to us via Dr. Maughan
Thank you for your thoughtfully prepared design review earlier today. I wanted to share with you some feedback (mostly positive) from assessment forms from the attendees.

1) Average scores (out of 5)

Organization - 4

Delivery – 3.5

Completeness - 3.5

Visual Aids – 3.75

Audience interaction - 4

Concept Design/Quality - 3.5

Project Management - 3.5

Note: in general, 3 is meets expectations/is adequate, 5 is exemplary

2) Summary of comments

Organization – Logical progression of topics; Twister and Bender not clearly described as being separate

Delivery – clear, steady and thought given to discussion points; some obvious reading and quiet/hard to understand times

Completeness – Most issues discussed. Visual aid for parameters would be an improvement

Visual Aids - good use of digital tools, clear renderings/visual aids, some aids lacked context

Audience interaction - clearly listened to and understood audience questions. Able to address them

Concept Design/Quality – manual not discussed; need to include more information of final design parameters or future work

Project Management - Demonstrated use of time and awareness of milestones/cost, could use more specificity; need to plan for future contingencies

You are making good progress toward your goals. Keep up the good work as you finish up the summer semester and start into the fall.

-Mike

Team Meeting Minutes
Tuesday, August 2, 2016
Design Suite at 11:00

- Review updated PowerPoint
- Everyone give their individual speaking parts
- Practice Speaking Parts as a Team
- Set up PowerPoint in GJ 112

Team Meeting Minutes
Wednesday, August 3, 2016
Design Suite at 12:30

12:30-1:30

- Review the portfolio
 - Husain
 - Add the outline and web link for the wikipage
 - Tristin
 - Print part drawing-short lateral bar with slots
 - Make formatting and grammar changes to the bill of materials
 - Jennifer
 - Add project learning with client-use e-mails with client
 - Complete the minutes for this week
 - Hai
 - Fix electrical system representation-move string potentiometer out of code area
 - Design alternatives-add an option for leaving the apparatus as is and check grammar
 - Finish inserting technical data sheets
 - Table of Contents
 - File management document needs updates
 - EVERYONE-clean out unnecessary files
- Review the wikipage
 - Tristin and Husain made formatting updates and Husain made grammar fixes
- Review the Snapshot Poster-Jennifer
 - Do we want an additional powerpoint? YES
 - Tristin is going to make the powerpoint
 - He is including
 - Include drawing package
 - Gantt Chart
 - Budget
 - Potential Risks
 - Renders (just a few)

1:30-2:30

- Meet with Brandon Morford to discuss the code
 - He is going to try and update the DC motor code, but we need to figure out what the interface is talking about
 - BY FRIDAY: understand and explain the motor speed, iterations, and step size
 - What do we need?
 - How do these buttons effect the motor?

2:30-4:00

- Hai—updating portfolio
- Husain—updating wikipage and creating Project Webpage Design for the portfolio
- Jennifer—meeting minutes and project learning
- Tristin—Snapshot Powerpoint