Team Meeting

01/12/2017

Time Start: 2:00 pm
Location: ME Conference Room
Attendees: Marshall Bolen, Lucio Barajas, Eric Hill, James Rockwell, Scott Smith
Recorder of Minutes: Lucio Barajas

Old Business

- N/A

New Business

- Model Tank
- Design Discussion
- Discussion on Filters

What was Covered

- Model Tank
    - Scott has it partially done
    - It will be completed Tuesday January 17th
    - It will be flat bottomed
- Design Discussion
    - Should our device operate in one direction or two?
    - What is the best shape for our sweep design?
        - Airfoil shaped
        - Symmetrical dome shape
        - Rotating semi-dome shape
        - Keep manufacturing in mind
    - How to make operating device automatic?
        - Pressure sensors
        - Potentiometer
        - Design it like the steam plant wood chip auger with a double relay
- Discussion on Filters
    - Sand filters
    - Centrifugal filter
    - External tank before filtration
    - Ask Dr. Xing about his research with counter rotating plates

Need to Bring to Next Meeting

- New meeting time for us students is at 2:00 pm on Tuesdays
- Reprint 3D model sweeping arm
- Update our dates on our Gantt chart

Time End: 2:42 pm

Team Meeting

01/17/2017

Time Start: 2:00 pm
Location: UI Library
Attendees: Marshall Bolen, Lucio Barajas, Eric Hill, James Rockwell
Recorder of Minutes: Lucio Barajas

Old Business

- N/A

New Business

- List of accomplished project parts
- List of current project needs

What was Covered

- List of accomplished project parts
    - Test tank is completed
    - Design type has been found
    - Sediment found
- List of current project needs
    - Print sweeper arm
    - Motor power design
    - Slip ring manufacturing
    - Tank mirror
    - Sediment separation
    - Finalize tubing
    - Automation
    - Simplification
    - Support sweeper for no deflection
    - CFD for inside of sweeper arm (if we have time later)
    - Installation (if we can get to it)

Need to Bring to Next Meeting

- Meet at 12:30 Wednesday for work
- Marshall - Motor research
- Lucio - Autonomous sweeper arm operation research, Talk to an EE about coding
- Eric - Sweeper arm manufacturing design and analysis
- James - Contact Scott Smith about sweeper arm needs, Start thinking about tank mirror design

Time End: 2:49 pm

Team Meeting

01/19/2017

Time Start: 2:00 pm
Location: ME Conference Room
Attendees: Marshall Bolen, Lucio Barajas, Eric Hill, James Rockwell, Tao Xing, Scott Smith
Recorder of Minutes: Lucio Barajas

Old Business

- Model Tank

New Business

- Dr. Xing's Suggestions
- Upcoming Dates

What was Covered

- Model Tank
    - It is about 1 to 33 scale size
    - Scott is adding finishing touches
- Dr. Xing's Suggestions
    - Focus on one design but also have a plan B
    - The design must be automatic, dynamic, effective
    - When testing to ensure repeatable test results we should conduct tests in sub teams and compare results
    - A brush to release sediment might be helpful in our design
- Upcoming Dates
    - Design review will be between January 31 and February 10
    - The collaboration group presentation will be the last week of March
        - It is mostly about what we got out of our project
        - 5 to 15 minute presentation
    - Expo April 28

Need to Bring to Next Meeting

- Continue to research and complete our assigned tasks

Time End: 2:33 pm

Team Meeting

01/24/2017

Time Start: 2:00 pm
Location: UI Library
Attendees: Marshall Bolen, Lucio Barajas, Eric Hill, James Rockwell
Recorder of Minutes: Lucio Barajas

Old Business

- Waterproofing Motor
- Sweeper Profiles
- Automation
- Tank Mirror

New Business

- Senior Lab Project

What was Covered

- Waterproofing Motor
    - There are waterproof motors for around $35
    - We could waterproof it using a waterproof putty: Sugru
- Sweeper Profiles
    - We have different designs chosen
    - We would have to test for the best profile, optimal rotating speed, curved or straight edges
- Automation
    - There are many examples online of relays being used to reverse motor rotation
    - They usually use switches
- Tank Mirror
    - We would need to weld a new base for it to allow for the mirror to be placed under it
    - This might only let a few people watch it at once
    - We could also live stream it onto a monitor or record it and play it on a loop
- Senior Lab Project
    - Some members have to do some testing for senior lab ME 430
    - Some thoughts for the tests include:
        - Testing how much sediment was removed
        - Total volume of sediment removed
        - Flow rate of sediment compared to that of water
        - Sweeping rates

Need to Bring to Next Meeting

- James: Email Scott the design ideas for the profiles and get tank info, finalize tank ideas
- Eric: 3D print profiles
- Marshall: Look into waterproofing motor or stepper motor
- Lucio: Continue Automation research

- Everyone: Look into separation

Time End: 2:50 pm

Team Meeting

01/26/2017

Time Start: 2:04 pm
Location: ME Conference Room
Attendees: Marshall Bolen, Lucio Barajas, Eric Hill, James Rockwell, Tao Xing, Scott Smith
Recorder of Minutes: Lucio Barajas

Old Business

- Waterproof Motor
- Profile Design
- Arduino Automation

New Business

- Scott and James's Discussion
- Live Streaming
- Dr. Tao's Comments

What was Covered

- Waterproof Motor
    - Cost $35 on Amazon.com
        - We should contact customer service to make sure it will spin slow enough
        - Or we should consider a stepper motor
    - Waterproofing cost of Sugru is $12
    - At $35 the already waterproof motor is the best choice
- Profile Design
    - We are leaning towards an easy to manufacture boxy shape
    - For the full scale size basic shapes will probably be used
- Arduino Automation
    - Scott has Arduinos and parts if we need
- Scott and James's Discussion
    - Most likely made from steel
    - Common shapes will be used
    - We could make it one way to be appealing and then recommend another profile for design fabrication
- Live Streaming
    - Easy to stream onto a large screen via Wi-Fi
    - Would be better for more people to see at once
- Dr. Tao's Comments
    - Suggests we do CFD simulation for presentation
    - Add a scraper design to suck up in only one direction at a time and increase suction
- Important Dates Coming Up
    - Design Review February 9th
    - Logbook Review February 17th

Need to Bring to Next Meeting

- Continue the same research

Time End: 2:30 pm

Team Meeting

01/31/2017

Time Start: 2:00 pm
Location: Senior Design Suite
Attendees: Marshall Bolen, Lucio Barajas, Eric Hill, James Rockwell
Recorder of Minutes: Lucio Barajas

Old Business

- Sweeper Arm Profiles
- Water Proof Motor

New Business

- Slip Ring

What was Covered

- Sweeper Arm Profiles
    - New idea for sweeper arm to be presented on Thursday
    - Simple shapes
    - Gear system to turn sweeper arm and wheel
- Slip Ring
    - Whole arm turned by motor attached to slip ring
    - Will have a stop to reduce area used in the slip ring
    - Have a way to keep it in place and watertight
- Water Proof Motor
    - Hold up on ordering until we size it for the new system

Need to Bring to Next Meeting

- 3D print some sweeper arms and maybe gears
- Start slip ring manufacturing plans

Time End: 3:30 pm

Team Meeting

02/02/2017

Time Start: 2:20 pm
Location: ME Conference Room
Attendees: Marshall Bolen, Lucio Barajas, Eric Hill, Tao Xing, Scott Smith
Recorder of Minutes: Lucio Barajas

Old Business

- Sweeper Arm Profile
- Waterproof Motor

New Business

- Gear Idea
- Slip Ring Design
- Design Review

What was Covered

- Sweeper Arm Profile
    - Non-uniform sweeper design
    - Need to find a fixed speed for rotation so we can evaluate the tip speed
    - Should help create even suction
    - We should look into cone shape or oval shape for design review
    - We should focus on multiple designs
- Waterproof Motor
    - We need speed ranges for it
    - Need to figure out a cleaning speed
    - Figure out if we need to get a stepper motor
- Gear Idea
    - To increase torque and reduce motor speed we could use gearbox
    - Keep the total number of gears low (the less moving parts the better)
    - Gears can be made with gear tracks and 3D printer
    - Large custom made gears could get expensive
    - Large axel will need substantial support to avoid deflection
- Slip Ring Design
    - It will have a stop to help with flow
    - The whole device could be rotated around the slip ring with a gear
- Design Review
    - Do a quick recap of the background information
    - Label drawing parts

Need to Bring to Next Meeting

- Design Review Slides due by Wednesday afternoon

Time End: 2:55 pm

Team Meeting

02/23/2017

Time Start: 2:00 pm
Location: ME Conference Room
Attendees: Marshall Bolen, Lucio Barajas, Eric Hill, James Rockwell, Tao Xing, Scott Smith
Recorder of Minutes: Lucio Barajas

Old Business

- Sweeper Arm
- Sediment Friction

New Business

- Prototype Testing
- Friction in Design
- DFMEA

What was Covered

- Sweeper Arm
    - It is slightly bent
    - Will need to reprint or find a way to fix the issue
        - Make it adjustable somehow
        - Use eccentric tubing
        - Flexible tubing where slip ring and sweeper connect
- Sediment Friction
    - Dr. Liou has not yet responded
    - Eric will try to contact him again
    - Sediment becomes stickier the longer it is left to settle
    - Testing could be helpful to verify CFD
- Prototype Testing
    - For initial testing we could manually rotate the arm
    - We could use a long shaft to attach a motor without the need to waterproof it
    - There are waterproof cases we could use for our stepper motor
    - For snapshot a two minute cleaning operation would be enough
- Friction in Design
    - We could add a wheel on slip ring
        - Reduces friction
        - Could be used for height adjustment
    - We could use shim stock (thin steel) or a washer
- DFMEA
    - Scott would like us to have this started by next meeting

Need to Bring to Next Meeting

- Have DFMEA started
- Working prototype ready for testing

Time End: 2:25 pm

Team Meeting

03/02/2017

Time Start: 2:00 pm
Location: HEV
Attendees: Marshall Bolen, Lucio Barajas, Eric Hill, James Rockwell, Tao Xing, Scott Smith
Recorder of Minutes: Lucio Barajas

Old Business

- Tank Appearance
- Exit Pipe
- Stepper Motor

New Business

- Manual Rotation Supports
- Attaching Driving Gear

What was Covered

- Tank Appearance
    - Model tank is finished
    - Has same appearance as real tank
    - Will be presented outside for design Expo
- Exit Pipe
    - Has been installed and sealed
    - Is adjustable
- Stepper Motor
    - Has around 400 steps
    - Costs about $20
    - We will order an extra in case there is an incident
- Manual Rotation Supports
    - 3D printed supports for long axle
    - Now it needs a support to fix depth at which the axle will stop
- Attaching Driving Gear
    - Driving gear is not meant for the rod size
    - It will need to be attached somehow
        - Possibly screwed on
        - Have the rod machined into a square and glued on
        - Have an adjustable screw the same way the supports are built

Need to Bring to Next Meeting

- Have these gear attached and ready to start testing

Time End: 2:20 pm

Team Meeting

03/09/2017

Time Start: 2:05 pm
Location: ME Conference Room
Attendees: Marshall Bolen, Lucio Barajas, Eric Hill, James Rockwell, Tao Xing, Scott Smith
Recorder of Minutes: Lucio Barajas

Old Business

- Stepper Motor
- Testing Suggestions
- Registration

New Business

- Testing
- Final Report for Scott
- Collaboration Presentation

What was Covered

- Stepper Motor
    - ordered two and are on the way
- Testing Suggestions
    - Take photos and video
    - Table summarizing parameters (rotational speed, flow rate, etc.)
    - Vary these at least four times
    - Look into how water level affects cleaning
    - Have a theoretical analysis
    - Use fluid mechanics equations
- Registration
    - Already registered
    - We checked outside booth, technical presentation, electricity
- Testing
    - Tank leaks from a few places
    - Slip ring to exit pipe piece does not seal properly
    - It will be fixed by the time we come back
- Final Report for Scott
    - Test information, figures, tables, CFD
    - Keep it brief
    - Some parts to outline are the executive summary, procedure, methods, design, results, etc.
    - Also attend final report class on March 21st
- Collaboration Presentation
    - March 29th from 11am-1pm at either the Pitman Center or Commons
    - About a 10-15 minute presentation (focus on the results)
    - Around 6 slides

Need to Bring to Next Meeting

- Begin testing

- Look into getting a final poster
- Start coding stepper motor

Time End: 2:34 pm

Team Meeting

03/23/2017

Time Start: 2:00 pm
Location: HEV
Attendees: Marshall Bolen, Lucio Barajas, Eric Hill, James Rockwell, Scott Smith
Recorder of Minutes: Lucio Barajas

Old Business

- Model Tank
- Testing
- Stepper Motor
- Collaboration Presentation

New Business

- Lux Meter

What was Covered

- Model Tank
    - Still leaking but Scott will fix it by the weekend
- Testing
    - To test amount of sediment removed we will need a lux meter to measure light intensity
    - Light will be measured before and after a cleaning cycle in the removed sediment
    - The parameters tested will be the amount of head used to create the flow, sweeper arm used, and rotational speed
- Stepper Motor
    - Still on the way
    - They were out of stock
    - The code will be an edited version of an existing arduino library code
- Collaboration Presentation
    - 10-15 minutes presentation on March 29th
    - Location still unknown
    - Our presentation time is before 12 pm
    - 5-7 slides with the last one being a questions slide
    - Take about two minutes on each slide
    - Send Scott the presentation by tomorrow afternoon
- Lux Meter
    - Cost is around $100
    - Will be purchased with senior lab budget

Need to Bring to Next Meeting

- Send Scott the presentation by tomorrow afternoon
- Find a time for testing on either the weekend or early next week

Time End: 2:35 pm

Team Meeting

04/06/2017

Time Start: 2:07 pm
Location: ME Conference Room
Attendees: Marshall Bolen, Lucio Barajas, Eric Hill, James Rockwell, Scott Smith, Tao Xing
Recorder of Minutes: Lucio Barajas

Old Business

- Senior Lab Testing
- CFD

New Business

- Motor Mount
- Next Week

What was Covered

- Senior Lab Testing
    - Start preliminary testing design
    - To separate and reuse the sediment we could evaporate the water out
    - Have a video by next Thursday
- CFD
    - Eric has it started and is working on it
    - Has questions about convergence
- Motor Mount
    - Marshall has a SolidWorks sketch
    - Planning on 3D printing today
    - Have a plan B in case 3D printing doesn't work
    - We could ask Bill for help machining
- Next Week
    - Prepare a presentation for next week
    - Logbooks due April 14th

Need to Bring to Next Meeting

- Have some testing done
- Presentation done for next week

Time End: 2:17 pm

Team Meeting

04/13/2017

Time Start: 2:00 pm
Location: HEV
Attendees: Marshall Bolen, Lucio Barajas, Eric Hill, Scott Smith
Recorder of Minutes: Lucio Barajas

Old Business

- Motor Mount
- Arduino Code
- Light Meter

New Business

- Issues to Fix

What was Covered

- Motor Mount
    - 3D printed already
    - Can easily support the motor
- Arduino Code
    - Ready to use
    - Slowest speed is about a 3 minute cleaning time one way
- Light Meter
    - Ordered with senior lab budget
- Issues to Fix
    - We may need to glue the middle support to the bottom of the tank to prevent it from moving
    - The wires leading to the motor may need to be extended to keep the h-bridge and Arduino out of the way
    - Triangle support on top will need to be extended to prevent motor mount from falling

Need to Bring to Next Meeting

- Test prototype
- Send Scott a drawing for our stand by Tuesday
- Start Expo poster

Time End: 2:15 pm

Team Meeting

04/20/2017

Time Start: 2:00 pm
Location: HEV
Attendees: Marshall Bolen, Lucio Barajas, Eric Hill, James Rockwell, Scott Smith, Tao Xing
Recorder of Minutes: Lucio Barajas

Old Business

- Lux Meter
- Testing Plans
- Tank Stand

New Business

- Expo Preparation

What was Covered

- Lux Meter
    - It came in today but we still need to pick it up
    - We have a device made to test cleanliness of water
    - It will block out all external light only measure the one coming from the spotlight through the water
- Testing Plans
    - Varying head, rotational speed, suction sweeper
    - We are using our light sensor to measure water cleanliness
    - We will test from now to Expo because it the sediment takes time to settle
    - Have a table with our results
- Tank Stand
    - It will be elevate our tank about 4 ft
    - Made on angle iron
    - Movable mirror on the bottom
- Expo Preparation
    - Poster
        - 30x40 in format
        - Printable with ME budget
        - Send it to Dr. Xing by Monday to be approved
        - Have completed by Tuesday to print at the copy center
    - Presentation
        - April 20th at 10 am
        - Suggested we leave 1 or 2 people at our booth while we present

Need to Bring to Next Meeting

- Testing Results

Time End: 2:20 pm