

Shared Vision for Week 12 - P14045

4 Main Questions:

I.) What did we say we were going to do?

We set our goal to answer the high priority questions asked in the Shared Vision for Week 7 in order to have a successful Week 9 Subsystems Review.

Group Plan:

1. Develop a single system (kit) for both the red and blue stander.
 - a. Wheel System
 - b. Tray System
2. Develop legacy code to work on the new Stellaris Launchpad.
3. Assure Bluetooth connection functionality.

JD :

1. Have pseudo code written for Motor driving (updating speed and reading encoders), Bluetooth or wireless, UART communication.
2. Test out old stander and see what worked on the red stander (encoders and driving straight) vs the blue stander.

Alex:

1. Take measurements of both standers.
2. Determine how much load is on each corner of the stander.
3. Create a more final sketch/model of mount.
4. Perform hand calculations to determine strength of design.
5. Possibly supplement with ANSYS calculations.
6. Look into different manufacturing processes (CNC, 3D print).
7. Look into different materials (Metal, Stick plastic, 3-D printed plastic).

MV:

1. In order to assure bluetooth compatibility: devise a dummy program that will light up an LED light whenever detecting a connection.
2. In order to measure how long the response time of the controls (both on stander and remote) will take: test legacy code and debug.

GR:

1. Finalized design of control mounting system - YES
2. Engineering Analysis of control mounting system - YES
3. Research materials to use - YES
4. Develop ipad integration - NO

5. Research web to wifi integration - NO
6. Work on presentation - YES
7. Complete assign tasks for MSD - YES
8. Lead group in the correct direction - YES

EC:

1. Measure available mounting space on both standers - 10/11 (depending on when we can see the blue stander again)
 2. Box material benchmarking – 10/11
 3. Confirm components (i.e. which boards) with EE's – 10/18
 4. Determine cooling needs – 10/19
 5. Determine size of the boxes – 10/20
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II.) What did we actually did do?

Group: Developed Presentation

JD/GR/MV: Troubleshooted and got red stander working for Linda.

EM/AH/GR: Developed Tray System

AH/GR: Force Analysis of Tray System

GR:

1. Finalized design of control mounting system
2. Engineering Analysis of control mounting system
3. Research materials to use
4. Developed/Organized on presentation
5. Complete assign tasks for MSD
6. Lead group in the correct direction
7. Assisted in getting Red Stander to work

Alex:

1. Developed wheel mount adapter concept (remodeled)
2. performed a preliminary analysis w/hand calculations
3. Determined that 3D printing and CNC would probably be the manufacturing options.
4. Attempted to contact John Bonzo for manufacturability - no reply

JD:

1. Did some initial code microcontroller conversion/debugging
2. Defined the Old electrical system
3. Worked out old pseudocode

MV:

1. Continued benchmarking of modular control inputs (touchscreen overlay)
2. Developed basic code organization and flow at both, high level (Connecting main system & different input controls [i.e. Remote, Buttons & Touchscreen]) and intermediate level (Touchscreen).
3. Composed Preliminary B.O.M.

EC:

1. Measure available mounting space on both standers
 2. Develop Tray system:
 - a. Went to Monroe Wheelchair and Chevy dealership to brainstorm - actuator idea
 - b. Worked with Greg and Alex on tray system mock up
 - c. Benchmarking on actuator selection and mounting
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III.) What did we learn?

JD:

1. The old code is compatible only up to a point.
2. The Blue standers encoders didn't work because they weren't plugged in or implemented at all.
3. Code composer is hard.
4. Wear clothes to match the rest of the group for presentations.

Alex:

1. FEA/deeper stress analysis will be more difficult than I thought. I will need consultation with faculty for assistance
2. Getting a hold of John Bonzo proved more difficult than I anticipated

Greg:

1. Lego tray needs to be kept and legal stuff needs to be determined.
2. EE need to have set deadlines in order to ensure the project keeps moving forward and to reduce pressure from Dr Day.
3. Decided to not focus on ipad integration in order to further develop other systems.
4. Getting into the laser lab was difficult.
5. Begin to order parts in order.
6. Having a lab near the Machine Shop is handy when brainstorming.

EC:

1. Actuators are complicated - many different types and uses - need help on this.
2. Learned basic ideas behind actuators.
3. Lego tray needs to be kept and legal stuff needs to be determined.

MV:

1. How resistive touchscreen overlays work
 2. How to organize the basic code flow for interfacing with different control systems.
 3. Make sure to have fully charged batteries when testing stander.
 4. How to make my own parts for a PSpice Schematic Diagram.
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IV.A) What do we need to do? (GROUP)

We must work as a team and answer the set of questions raised through our Subsystems work and development.

1. B.O.M. further developing with Dr. Day (10/31/2013)
 - a. Develop a Best/Worst Case scenario for pricing
 - b. EE B.O.M. Should be finalized by tonight (aids in proof of concept)
 - c. Dr. Day will meet with us tomorrow after class (3pm)
2. Wheel System
 - a. Deeper analysis/ further development, see Alex's
3. Tray System
 - a. Flush out actuator decision
 - b. Meet with Hanzlik (10/31/2013)
4. Box System
 - a. Electrical Engineering Diagram of Connections ON Stander for the Boxing of Components
 - i. JR & Martha will meet to discuss this
 - ii. Tentative deadline 11/01/2013
 - b. Modular Controller Board Location
 - i. Group will meet and discuss possible options (10/30/2013)
 - c. ME: develop box system to encase EEs components
5. Controls System
 - a. Bluetooth
 - b. Touch Screen Overlay Development
6. Main system
 - a. Further developing code
 - b. Working model of system

Remaining Questions:

1. How to guarantee straight travel? - mechanical contributions as well as electric
 2. How will we make sure the stander runs smoothly? - empirically define "smoothly"
 3. How will the Automated tray work?
 4. Maintain max allowable weight?
 5. How long will the response time of the controls (stander/remote) take?
 6. How will we test touchscreen overlay?
 7. How can we improve the current bump sensor?
 8. Begin battery/controller packaging design.
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IV.B) What do we need to do? - (INDIVIDUAL)**Alex:**

1. Need to have meeting with John Bonzo for Manufacturability.
2. Need faculty consultation on Sleeve stress and FEA (Probably Dr. Boedo).
3. Get Details for mount finalized based on further analysis.
4. Assist with tray system development (actuation, design).

JD:

1. Figure out coding of control system (Dr. Hopkins or Dr. Patru).
2. Define placement of controller boards and the connection between them.
3. Finish the schematic for the mainboard electrical system, down to pins on the microcontroller.
4. Start a mock-up or test apparatus for the wheel system (largely part dependent).

MV:

1. More testing is needed for Bluetooth Connection development.
2. Professional (expert professors) input is needed in order to prove our design concepts.
3. Once final B.O.M. for electrical components is decided, purchase necessary boards and materials to commence actual testing of design.

GR:

1. Legal stuff needs to be determined for Lego tray.
2. EE need to have set deadlines in order to ensure the project keep moving forward, will work with them on plan working on actuator for tray system.
3. Work with EEs and MEs on packaging system.

EC:

1. Need technical help with actuator development - meet with Hanzlik and others if necessary.
2. Need to return focus on the packaging.
3. Work with EEs to determine heat dissipation requirements.
4. Work with EEs to determine physical size of boxes as well as wiring connection points.
5. Make contact in packaging science department for technical help with material selection.