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4/8/22

ECEN 3753

Project HarkonnenPong Week 4

Unit Testing

Platform Motion

- Test if platform doesn't move when no force is applied and velocity is 0 (Pass)
- Test if platform maintains nonzero velocity when no force is applied (Pass)
- Test if platform increases velocity when force is applied in the same direction of the velocity (Pass)
- Test if platform decreases velocity when force is applied in the opposite direction of the velocity (Pass)
- Test if low and high force has difference on accelerations (Pass)

Holtzman Mass Motion

- Test maintained x velocity of Holtzman Mass (Pass)
- Test constant downward acceleration of Holtzman Mass (Pass)

Holtzman Mass Out of Bounds Check

- Test LED flag set when Holtzman Mass crashes (Pass)
- Test if Holtzman Mass is replaced after exiting the range (Pass)
- Test if Holtzman Mass is replaced for a number of times based on a variable (Pass)

Functional Testing

1. At reset observe that the left LED is blinking at the slowest rate. (Not Run)
2. Place your finger on the touch slider and slide your finger to the middle right and observe the platform accelerating rightward. (Not Run)
 - a. Release your finger and observe the platform maintaining velocity. (Not Run)
3. Slide your finger to the far right before it hits the border and observe the platform accelerating faster rightward. (Not Run)
 - a. Release your finger and observe the platform maintaining velocity. (Not Run)
4. Slide your finger to the far left before it hits the border and observe the platform decelerating before accelerating leftward. (Not Run)
 - a. Release your finger and observe the platform maintaining velocity. (Not Run)
5. Press Btn1 and observe the Holtzman Mass count decrease on the LCD and the y-position of the holtzman mass reset to the top of the screen. (Not Run)
6. After pressing Btn1 several times, observe that the button no longer has any effect.
7. Move the platform away from the falling Holtzman Mass and observe it activates the game over screen and the right LED blinks at 1 Hz. (Not Run)
8. Move the platform in the Holtzman Mass' path and observe it bounce off the platform. (Not Run)

- a. Observe after repeated bounces that the peak of the parabola is getting lower. (Not Run)
 - b. After several bounces, observe that when the peak is vertically close to the platform that the mass phases through the platform. (Not Run)
9. Press Btn0 when the Holtzman Mass is near the platform but hasn't hit it yet and observe that upon bouncing, the peak of the parabola is higher than before. (Not Run)
10. Use the slider to match the right and left LED's pwm while the right LED is blinking and observe that the platform will collide with the holtzman mass. (Not Run)
11. Bounce the holtzman mass outside of the canyon and observe the same thing happen as what happens when btn1 is pressed. (Not Run)

Functionality Deliverables and Usability Summary

This week I tested my capsense code, and concluded the errors given before in Lab 7 are gone. I set up most of the integration testing cases. I also implemented the btn 1 laser reset flag. I believe I have settled on the task diagram which has not changed other than using color coding to better visualize the distinctions. I completed the unit tests from week 3 and got them all to pass.

Summary effort & estimate numbers

I have completed **32.5%** of my currently-scoped, estimated work time (39 actually spent /120hr total estimate) with **64.1%** of the initially-estimated work. (76.9 estimated for the items I have completed, of 120hr total estimate). For the work that has been completed, I took **0.501x** (39/76.9) as much time as I estimated.

No scope changes have been made this week, My latest scope is still my original scope (120 hrs), but the estimates include partial completion contributions.

In-scope work items

Completed before this week:

- Project Reading and Task Diagram First Draft creation (est 10 hrs) (actually 8 hrs)
- Learn How to Manipulate LCD basic drawings (est 20 hrs) (actually 1 hr)
- Lose Condition LED Control (est 1 hr) (actually 0.5 hr)
- Configure slider to control LED PWM (est 2 hrs)(actually 3.5 hrs)
- Create Tasks and Test on Segger (est 2 hrs)(actually 2 hrs)

Completed this week:

- Slider Testing/Fixing (est 6 hrs)(actually 2 hr)

Lab 7 had issues with the slider becoming defective after a couple minutes of use. This wasn't tested with the includes added near the Lab 7 deadline. This is theorized to have fixed it since testing this week over the two hours resulted in no issues in the original Lab 7 code. The difference in time is saved due to not needing to rework the capsense code.

- Task Diagram Revision for clarification and necessary optimization (est 3 hrs) (actually 2 hrs)

At first, I was uneasy with how I did the task diagram at first. It looked messy to me, and I was unsure if the connections were optimal for what I wanted to do. After many days thinking, I have settled that the design was good for what I wanted to do. I did change the colors of the arrows to reflect 3 different types: HM Vector is red, Platform Vector is blue, and everything else is black.

- Laser Implementing (est 1 hr)(actually 1 hr)

I implemented a flag that only posts if the button is pressed and not unpressed and tested it in the systemview to ensure it was working correctly with btn 1.

- Task Integration Testing (est 10 hrs)(actually 4 hrs)

The integration testing was initially predicted to take as long as the unit testing, but due to how the unit testing had more coding involved and more internal factors that needed testing, I only needed to include tests for the content in the initial project description document.

Significant Partial Completion for estimate numbers:

- HM Physics Unit (est 10 hrs)(4.5 hrs so far)(90% progress complete)

Completed unit tests. Just need bounce conditions and implementation in simplicity.

- Platform Motion (est 1 hr)(4.5 hrs so far)(90% progress complete)

Passed unit test. Implementation remains.

- Task Unit Testing (est 10 hrs)(5 hrs so far)(90% progress complete)

All of the unit tests created last week now pass but more could be created for the right led predictions.

- Motion/Position Physics Task (est 10hrs)(1 hrs so far)(30% progress complete)

Physics unit tests passed. Needs implementation of what I have on vscode and collision physics.

Not Completed yet:

- Basic Platform/HM collision (est 2 hrs)
- Platform/HM collision with bounce (est 5 hrs)
- Platform Bounce (est 2 hrs)
- Qualification Check/Debugging (est 15 hrs)
- Platform Interception Prediction LED implementation (est 5 hrs)
- Commenting and Code Cleanup (est 5 hrs)

Risks

Item				Risk (P*)	Recognize	Mitigated/ Resolved	ROA	How
I will too long to figure out the LCD screen	2	5	10	11-Mar-22	Mitigated	M	Got help and clarification on the basics from a TA	
PWM is too slow to change brightness	8	3	24	15-Mar-22	Mitigated	M	Changed goal from changing brightness to blinking rate	
Changes in PWM can't be recognized/decoded	3	13	39	17-Mar-22		O	Use own judgement for which PWMs are distinct enough	
My slider is sticking after some time operating	1	1	1	11-Mar-22	Resolved	R	New includes seemingly made the problem disappear	
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