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ENSE 481
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Ball Height Controller Testing Plan

Test Methods

1. Run the servo motor at different speeds.
This can be done by experimenting with different duty cycles and analyzing the resulting speed of the servo motor. Trial and error will be part of the process for finding appropriate duty cycles for operating the servo motor to fit the needs of this project.
2. Read and utilise data from the infra-red sensor.
The connectivity and data feed from the infra-red sensor will be tested as it is implemented into the device. This can be done by outputting data readings at intervals to a terminal or to a text file and can be analyzed as the ball is at different heights. This will also be essential in finding the limits of the infra-red sensor such as its maximum, minimum, and working accuracy.
3. Test using FreeRTOS
FreeRTOS will be implemented and tested. Through testing it will be determined if using an RTOS is necessary at all. By analyzing the effects of the RTOS (Concurrency primarily) the decision to stick with or abandon FreeRTOS can be made.
4. Test functionality and thresholds of the proximity sensor.
Through trial and error I will be able to find the thresholds of the proximity sensor. How close does the ball need to be? Will it remain consistent when an object is near? How else can this data be useful?
5. Control systems/ state machine
I will be using a test suite to test the control flow of the program as well as the state machine(if used) for accuracy of all cases including fringe cases.

Test Equipment

- Oscilloscope for testing and monitoring connections between pieces of hardware.
- Com terminal for testing and debugging using USART.
- STMCube debugger for bug splatting.
- Test suite possibly using Doxygen format for writing system test suites.

Test Conditions

I will test all the components to their working limits to find the best operation and/or limits of the data they can produce in the given environment. I will keep track of test results in different versions as well as test results of different conditions.