Motor Control Progress Report #5

Skittle Sorter Project

Jaidon Lybbert, Motor Control Design Lead, EWU IEEE Student Chapter

Week of 08/02/20

Problem:

- Because we decided we are going to interface with the stepper motor control through software rather than hardware, the code has to be modified to take controls as parameters in code, rather than as GPIO inputs. Additionally, since the UMC was intended to be dedicated to a single motor, the code now must be abstracted so that it can be used for several motors.
- The I2C.c code used for the color sensor was large and consisted of several sections (I2C, UART, color processing) that could be separated into individual modules.
- The motor control code had dependencies that were implementation specific (init.c primarily) which prevented the code from being separated and used elsewhere
- The color sensor and motor control worked together, but had bugs
- Issues arose using VSCode to flash binaries to the tm4c when the current flashed program included the color sensor code

Research:

- Research was done on color sensor used in order to integrate the hardware into my home project setup, and further understand the sensor code
    - https://www.alldatasheet.com/view_datasheet.jsp?Searchword=TCS34725

Action:

- Abstracted stepper code to be functional with multiple motors driven from the same tm4c
- Helped color sensor team in splitting large I2C.c file into smaller modules
- Removed dependencies and hardcoded addresses from stepper code
- Fixed bugs with integration of the sensor code with the motor driving code

Value:

- With the new code abstractions, we will be able to drive stepper motors for both the chute and the table components of the sorting machine
- By splitting the I2C.c file, we are now able to port the smaller modules into other projects in the future, without including a lot of unnecessary code that would add clutter and confusion
- Removing dependencies and hardcoded addresses from the stepper code prepares us to eventually compile this code as a library object file to be used in projects without the need for recompiling
- Fixing the bugs introduced with the interface of the two systems allows for further testing and integration with the remaining systems