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Individual Journal (02/13)

Last week our team had to update our project work statement from last semester. In order to properly update the schedule from the software perspective, I looked into the libraries for the specific radio with our microcontroller. From looking at the radio libraries, I learned a lot about how the data needs to be formatted in order to be transmitted as well as how the radio receives data.

In order to prepare data to be transmitted, our group began fine tuning our accelerometer by checking for any issues still lingering from last semester. When we were checking our readings, we noticed that the accelerometer was not completely soldered to the microcontroller causing some of the fluctuations in the output that I had noticed. Once the soldering issue was resolved, we were able to notice an improvement in the readings that helped with getting the formulas for the collisions to be more accurate.

In addition to fixing the hardware connections, we each began looking up good cost-effective helmets that our device could realistically fit into while also remaining in our team budget. The specifics I was looking for in the helmet was the padding inside so I could see where the device would fit inside the helmet. Eventually, our group found a helmet that could satisfy our requirements and determined that we could replace some of the interior foam padding with the device to then place the padding back over it.

Also, this week our group had to prepare an updated project proposal for this semester. This was not as easy as it could have been since our original project proposal last semester was for a different project that we ultimately decided against continuing with. So, our group had to right the project proposal from scratch without a proposal from last semester to reference. The proposal was not difficult to write overall as we had already discussed everything that was needed in the updated proposal the week prior when updating our work statement.

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Individual Journal (02/27)

Last week our team began evaluating the accelerometer after fixing the hardware connections, but the device still suffered from calibration issues. In order to try to fix the issue, we tried another accelerometer of the same model to check if the device itself was defected, but both suffered the same calibration problem. So, our team reached out to the professor and setup a meeting on Microsoft teams to discuss the issue.

Once our team spoke to the professor, we came to the conclusion that the accelerometer should be replaced with a device that would be more reliable to calibrate for use with the project. We also shifted the project from using the acceleration on a helmet to using a knee pad or sports sock since the price of most football helmets were outside of our budget with the purchased helmet arriving from Amazon lacking the proper padding to be used in sports.

With the project shift, I began researching options for storing data collected from the accelerometer based on suggestions from the professor. One idea was to store collected data on an SD card to have the ability to be taken out of the device and examined on a computer by the user. In order to figure out how to implement an SD card in the project, I began looking for a library for Arduino products that supports SD cards. I discovered that Arduino has a SD library that I can open files with to both read and write directly to a file on the SD card connected to an Arduino device very similarly to the fstream library in C++.

After researching libraries, I moved to setting up a GitHub repository for our project. My only experience with GitHub prior to this project was through the command line interface using git so I had to teach myself how to be more familiar with the website version. From there, I had to begin collecting our project's documentation and begin organizing it for the GitHub repository.