Senior Design May 24, 32

MicroCART Senior Design Team

Week 19 Report

Februry 3 - February 9

Faculty Advisor: Philip Jones

Members:
Justin Kenny - Scribe
Steve Frana - Technical Lead
Trevor Friedl - Project Manager
Travis Massner - UI/UX Designer
Clayton Kramper - Technical Lead
Will Maahs -Team Organization Lead

Links

- [Shared Google Drive Folder](#)
- [Tentative Project Gantt Chart](#)
- [MP4 Timing Data](#)
- [Microcart Packet Structure](#)

Summary of Progress this Week

We were able to get the partition SD card running on the Raspberry Pi Zero 2W with the sample LED program by changing the memory addresses provided in the sample program. The issue with booting linux we experienced on Monday seemed to have resolved itself somehow. We are now planning on starting the shared memory buffer following another GitHub tutorial we found. We also generated a new VM with all the required libraries, although this may need to be cut down further.

When we are setting parameters from a json file, the backend crashes before we are able to finish setting the entire set of parameters. We need to figure out a solution for this. We started updating the documentation of PycroCart on the git repository, but still need to start filming some new YouTube videos. After that, for more progress to be made we think it would be wise to add a "plotting packet" to drastically reduce the overhead required for plotting data in the GUI. We were discussing that it may be more beneficial to first implement the plotting packet in the C++ GUI before recreating it in PycroCart. This allows for the possibility of students in 488 THIS semester to experience improved performance in plotting data points in the GUI.

We continued testing the MP4 lab with the new cflib adapter. We were able to track down the logging issue and also realized that we were running the old crazycart script when we thought we were testing the new cflib adapter. Once we started using the new script, we ran into a couple further issues.

One being that it was asking to update the git submodules. This was easily fixed by running make cload in the Lab part 1 folder. The other was that the crazyflie radio seemed to be disconnecting from the crazyflie somewhat frequently. We were unable to figure out the issue and just resorted to trying to restart the GUI/system until the problem resolved itself. Overall we are almost done with Part 1 of the lab.

Pending Issues

- We need to rework the logic for how the progress bar is updated within PycroCart_2.0. This is a minor detail and shouldn't require too much effort.
- Add documentation for PycroCart
- Unsure of the difficulty of porting drone firmware FreeRTOS.
- Crazyflie Radio seems to be disconnecting from the crazyflie somewhat frequently

Individual Contributions

Member	Contributions	Weekly Hours	Total Hours
Justin Kenny	- Edited memory addresses in linker scripts on the sample program. - Ran LED blink program on Zero 2W. - Researched how to implement a shared memory buffer.	6	108
Steve Frana	- Helped debug cflib adapter for use in testing. - Ran bare-metal program and Linux together on Zero 2W - Found several implementations for shared memory to reference moving forwards	5	103
Clayton Kramper	- Troubleshooting the progress bar error - Troubleshooting errors when writing to backend	4	90

	- Started documentation for Pycrocart - Started working on plotting packet - Began making slidedeck for Pycrocart YT Video			
Travis Massner	- Testing the new cflib adapter with MP4 - Almost completed with Part 1 - Figured out logging issue	7	76	
Will Maahs	- Finished get param and set param - As a group went over rasberrypi partitioning - The backend crashes when we try to set params from a JSON file. Seems to be a backend issue? - Started working on plotting packet - Started adding documentation on the git repo for current state of PycroCart	4	99	
Trevor Friedl	- Spent time walking through on getting u-boot working and running on the Raspberry Pi Zero - Worked with Travis on testing cflib adapter for MP-4 - Removed OVA from repo and rerouted it onto CyBox for the time being (updated wiki along with it) - Spent some time updating the team website	8	81	

Comments and Extended Discussion

Plans for coming Week
- Possibly fix UART issues with freeRTOS
- Follow FreeRTOS-Linux shared memory buffer tutorial.
- Finish PycroCart documentation on the Wiki of the Git Repo
- Film a video on how to use both of the PycroCart GUIs
- Film a video fully explaining the current state of PycroCart
  - Suggestions for future teams
  - Motivations
  - Things to not do