Senior Design May 24, 32

MicroCART Senior Design Team

Week 18 Report

January 26 - February 2

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 continued following the GitHub tutorial on partitioning the cores for the Raspberry Pi 3. Due to some issues with reading the UART, we modified the example FreeRTOS application to turn on a led by setting a GPIO pin high. We were able to run this program by manually loading it with u-boot. We were also able to load the program then boot linux and observe the program continue to run.

We finished implementing the setparam and getparam functions in PycroCart_2.0. Setting parameters from the JSON file is functionally correct but visually needs to be fixed in the GUI. Once that minor detail is fixed, we need to do a full update on the documentation of PycroCart on the git repository, as well as film 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 continued testing the MP4 lab with the new cflib adapter. Once again, we were unable to get very far since the logging wasn't working properly. We tried different machines and different drones and were still unable to get it to work consistently. Since the MP4 lab was unable to be run, we decided to look through the MP4 documentation for things that could be updated.

Pending Issues

- It is unclear whether the movement of the sd-card with partition to the Zero 2W will be successful.
- 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.

Individual Contributions

Member	Contributions	Weekly Hours	Total Hours
Justin Kenny	- Debugged UART issues on RPI 3 - Fixed dcache error with u-boot - Added LED blink code to FreeRTOS application. - Ran LED blink program on partitioned cores	7	102
Steve Frana	- Helped with cross-compiling u-boot - Debugged UART - Used breadboard for UART and LEDs - Made serial connection with the bare-metal side of the Raspberry Pi using gpio pins	5	98
Clayton Kramper	- Finished get param and set param - Reviewing flipi documentation/videos - Functionally setting params from JSON files - Functionally correct, need to fix the progress bar - Started documentation for Pycrocart	4	86
Travis Massner	- Testing the new cflib adapter with MP4 - Still unable to get logging to work - Looked through MP4 documentation for	5	69

	things that needed updated		
Will Maahs	● Finished get param and set param ● Reviewing flipi documentation/videos ● Functionally setting params from JSON files ○ Functionally correct, need to fix the progress bar ● Started adding documentation on the git repo for current state of PycroCart	6	95
Trevor Friedl	● Looked more into issues revolving around CI/CD build layer failure and clone size reduction from .ova tag ● Continued to read through documentation for bare metal and FreeRTOS interfacing	4	73

Comments and Extended Discussion

Plans for coming Week
- Possibly fix UART issues with freeRTOS
- Try moving the sd-card to RPI Zero 2W and booting it, then solving any potential issues.
- Get the rest of the group up to speed on the partition process.
- Generate a new .ova with all the necessary libraries.
- 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