

Senior Design May 24, 32

MicroCART Senior Design Team

Week 25 Report

March 22 - March 29, 2024

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](#)
- [Crazyflie Status](#)

Summary of Progress this Week

We have been working on commenting out the hardware specific functions in the crazyflie firmware code and creating a baremetal application. This has also involved editing the makefile to support the structure of the crazyflie firmware. We are still working through getting it to cross compile without issues.

We uploaded the immutable VM .vdi and .box to ETG after some debugging. There is an issue to be addressed that Grant made us aware of regarding the pid values. We joined the discord and began working to help students with any lab issues they come across.

This week started the MP4 lab for CPRE 488. Overall, students started making progress throughout lab part 1, some of which were able to make great headway, but it seems that almost every team ran into several issues and crashes throughout both of the sections. Quite a bit of USB issues, slowing of the GUI, and logging/parameters not working properly. We've started to document these changes and plan to push out another instance of the VM by the beginning of next week.

Pending Issues

- Add documentation for PycroCart
- Fix the VM so that mp4json values are all set to 0 initially.
- There are still some submodules in the crazyflie firmware/vendor folder (not sure if this has been addressed)
- Crazyflie Radio seems to be disconnecting from the crazyflie somewhat frequently
- Plotting Packet (future)
- How much firmware will need to be rewritten for the Flypi (some folders such as the deck drivers will most likely be left out, for example)?
- Did ETG respond to our email with the immutable VM?
- Should we just have the students use the Pycrocart GUI?

Individual Contributions

| Member | Contributions | Weekly Hours | Total Hours |
|-----------------|--|--------------|-------------|
| Justin Kenny | <ul style="list-style-type: none">● Created Lab VM for MP4 and worked with ETG to get it installed.● Merged more git branches into develop● Debugged header and makefile issues with creating the baremetal application. | 9 | 165 |
| Steve Frana | <ul style="list-style-type: none">● Helped create VM Image for lab.● Started to help with cross-compiling | 4 | 141 |
| Clayton Kramper | <ul style="list-style-type: none">● Kept working through firmware, commenting out hardware reliant code | 6 | 126 |
| Travis Massner | <ul style="list-style-type: none">● Helped prepare for MP4 lab | 14 | 124 |
| Will Maahs | <ul style="list-style-type: none">● Kept working through firmware and commenting out hardware specific code● Merged some branches into pycrocart_2.1● Helping Justin | 5 | 139 |
| Trevor Friedl | <ul style="list-style-type: none">● Helped prepare VM image and debug issues with guest additions, touched base with ETG● Helped test drones in 2041 before MP4 labs● Kept working on targeting submodules issues | 6 | 124 |

Comments and Extended Discussion

- Any guidance with the modifying the crazyflie_firmware code

Plans for coming Week

- Cross-compile crazyflie firmware and get it to run on the Pi without crashing.
- Write startup script to run baremetal programs on the Pi without manual starting them through uboot.
- Complete more advanced ring buffer style shared memory program.
- 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
- Post KiCAD tutorial to MicroCART YouTube
- Plotting Packet -Potentially
- Get FlyPi flying back in the air *without* the use of the test stand
- **Create Youtube video/wiki page that shows how to make VM immutable. (High Priority)**
- Create a better timeline for next year's team for MP4 (ie have VM ready by this date, etc).
- Have set Git repo organization plan ready by new week.
- Make a list of documents/wiki pages/document to update/create

Fixes for next MP4 VM iteration:

- Gregory's fix for the "Crazyradio not found issue"
- MP4 Params json set back to 0
- Getting rid of the shared_folder
- Double check that there is no personal files remaining on the VM