FSW Subteam
Weekly Updates, Spring 2025

Week 1

Team Progress:

- Onboarded 4 new members onto the FSW team
- Feature and personnel planning for every subsystem for Spring 2025:
    - https://github.com/cmu-argus-2/FSW-mainboard/milestones
    - https://github.com/cmu-argus-2/FSW-mainboard/issues

Individual Updates:

Perrin Tong

- Updated IMU driver to output uncalibrated gyro + magnetometer readings
- Reduced IMU memory footprint from 9% to 2%
- FlatSat planning

Week 2

Team Progress:

- FlatSat development:
    - Fuel gauge IC now integrated on FlatSat and EPS task
    - Started interfacing with avionics for acquisition of FlatSat peripheral boards
        - Battery board, solar panels
    - Testing XY boards and preparing for ADCS testing and calibration
- Comms - CDH integration:
    - Implementing basic commands to be transmitted from GS and executed on SC with a response back to the GS

Individual Updates:

Perrin Tong

- Updated firmware to include adafruit register
- Completely removed middleware from emulator + FSW
- Gyro+Magnetometer noise data collection
- Assembling FlatSat + testing boards for ADCS
- Designing new time processing module to encapsulate built-in time module, RTC, GPS and CMD.

Ankita Chatterjee

- Copied in MAX17205 (fuel gauge) driver and added fuel gauge data logging to the EPS task / integrated it into FSW

Alexis Duong

- Implemented SWITCH_TO_STATE, FORCE_REBOOT and REQUEST_TM_HEARTBEAT Commands
- Updated the Command queue between comms and CDH to be a single element queue
- Added a Response queue that will allow Comms to get the status of a command that was executed by CDH

Michelle Heo

- Finalized flat sat layout and laser cut. Asked for longer flexible ribbon cables to accommodate for new design
- Converted RC Net to ONNX model, converting ONNX model to TensorRT model

Alena Lu

- Removed temp simulation directory from FSW mainboard repo, to restructure w/GNC sim backend
- Ran with current CMake version on sim interface branch, lowering CMake version for Ubuntu 20 still in progress

Week 3

Team Progress:

- Reallocated human resources to have a better division of labour.
- FlatSat:
    - Waiting for new boards, day in the life test is stalled by not having enough boards.

Individual Updates:

Ankita Chatterjee

- Added eps state flag to indicate when SOC reading warrants change in state (e.g. when to enter low power, when to exit experiment/payload, etc)
- Researched potential watchdog IC alternatives if the 1.6 s timeout of the MAX706 is too short, but decided on advice from Akshat & Neil to hold off on that until we actually test FSW with the MAX706 enabled. Also came up with a testing plan w/ Akshat & Neil since technically there's no way to enable the watchdog right now with the current board

Alena Lu

- Successfully ran GSW sim installation + emulator and simulator on Ubuntu 20.04, resolved CMake compatibility issue and fixed argus sim installation issues
- Initial block diagram + implementation of RTC and Python time module package for hal

Alexis Duong

- Implemented precondition checks before executions of the commands

- Familiarize myself with the Data Handler in order to write the code needed for remaining commands (REQUEST_FILE_METADATA, REQUEST_FILE_PKT)
- Set up PostgreSQL as the database that interacts with the command interface and later on Grafana. Also, mocked up data
- Created a React + Node.js based command interface that makes calls to PostgreSQ

Perrin Tong

- Redesigning HAL boot and designing reboot sequence and handling.
- Magnetorquer + Magnetometer testing on XY boards and IMU
- Script updates

Michelle Heo

- Worked with Varun and Neil on bringing up custom kernel on Jetson
- Worked with Varun and Neil on modifying the device tree overlay to support 4 cameras