GNC Quad Chart

October 02 2024

External Tools Needed:

Blockers:

1. Nadir Pointing - Initial position/orbit knowledge based on SpaceX Transporter 15

Progress:

1. Tested and pushed an orbit determination algorithm to infer the satellite's ECI position and velocity based on detected landmark ECI positions, pixel coordinates, and time
2. Implemented magnetorquer models, detumbling control, and current distribution.
3. Concluded existing astrodynamics packages don't have the exact set of features we need. Decided to pursue a core C++ sim from scratch and use py-bindings to interface with python code

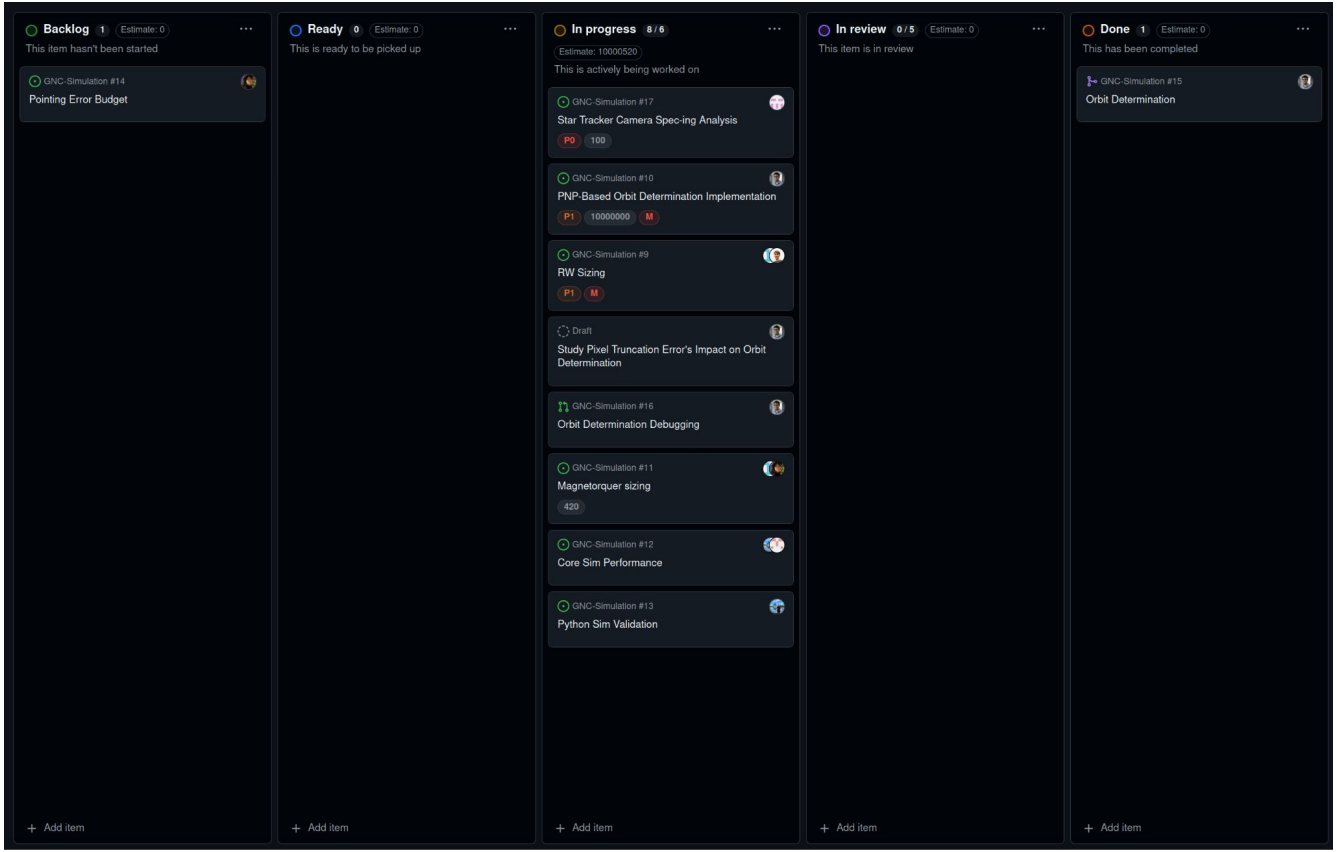
Plan for the Upcoming Week:

1. Complete and verify the core C++ sim
2. Implement spin stabilization, sun pointing, and plotting
3. Complete actuator sizing

Interfaces:

1. **Mech** -
   a. Expected Mass and inertia matrix of the satellite
   b. Expected misalignment with camera placement
2. **Vision -**
   a. List of camera models in consideration along with their expected errors due to pixel resolution
3. **Avionics -**
   a. Should have RW average & peak power consumption along with magnetorquer sizing by next week

Kanban


Backlog 1 Estimate: 0
This item hasn't been started
GNC-Simulation #14
Pointing Error Budget
Add item
Ready 0 Estimate: 0
This is ready to be picked up
Add item
In progress 8 / 6
Estimate: 10000520
This is actively being worked on
GNC-Simulation #17
Star Tracker Camera Spec-ing Analysis
P0 100
GNC-Simulation #10
PNP-Based Orbit Determination Implementation
P1 10000000 M
GNC-Simulation #9
RW Sizing
P1 M
Draft
Study Pixel Truncation Error's Impact on Orbit Determination
GNC-Simulation #16
Orbit Determination Debugging
GNC-Simulation #11
Magnetorquer sizing
420
GNC-Simulation #12
Core Sim Performance
GNC-Simulation #13
Python Sim Validation
Add item
In review 0 / 5 Estimate: 0
This item is in review
Add item
Done 1 Estimate: 0
This has been completed
GNC-Simulation #15
Orbit Determination
Add item