ENPH253 Team 1 Robot Photos & Videos

Line Following:

- Line Following Video 1
- Line Following Video 2

Rotary-encoded Roller Setup:

- Roller Video 1
  - Shows the rollers working in unison with the loader servo atop the ramp for can deposition
- Roller Video 2
  - Shows the rollers working in unison with the loader servo atop the ramp for can deposition
- Roller Video 3
  - Shows the rotary-encoder detecting a temporarily stuck can and reversing the roller spin direction to free the can for a second attempt
- Roller Video 4
  - Shows the rotary-encoder detecting a persistently stuck can, attempting a reversal, and then powering off the motors to avoid damage
- Roller Photo 1
  - Shows a side view of the ramp/roller setup with pulleys connected by elastics
  - Shows the rotary encoder wheel with black/white quadrants that was used for detecting stuck cans and re-orienting them
- Roller Photo 2
  - Shows a side/frontal view of the rollers and the loader servo
- Roller Photo 3
  - Shows the IR sensor used for quadrature encoding

Hopper:

- Hopper Video 1
  - Shows the hopper rotating and and trap door opening to deposit cans
- Hopper Photo 1
  - Shows the 4 hoppers created for various robots
- Hopper Photo 2
  - Shows a non-orthographic view of 3 hoopers containing cans

CAD:

- Link to Onshape full CAD used for design and laser cutting
- CAD Photo 1
- CAD Photo 2

- CAD Photo 3
- CAD Photo 4

Code:

- Link to Github with all source code (firmware, Python serial polling script for PID tuning, and Jupyter notebook for PID controller analysis)

- Paths to notable modules:
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When Disaster Struck the Morning of the Competition:

- Video of our motors shredding, and along with them, any hopes we had of winning
    - The motors make this loud shrieking noise suggesting irreparable damage to the drivetrain
    - Due to the spontaneous appearance of noise after a prior sky crane descent that went poorly, there were unwanted digital interrupts on the can proximity detector line. This detector is used to sense the presence of a can near the loader servo and initiate the rotation of the loader to deposit the can. The noise caused a false detection prior to the can being intaken which resulted in our loader servo being in the upright position before the can reached the correct location for depositing. Hence, the can rode up the loader servo arm and popped out of the robot instead of going in the hopper. This was not a problem we were having prior to the noise.