User Manual

NASA Robotic Mining Competition

CSE 4202 Spring 2021

Florida Institute of Technology

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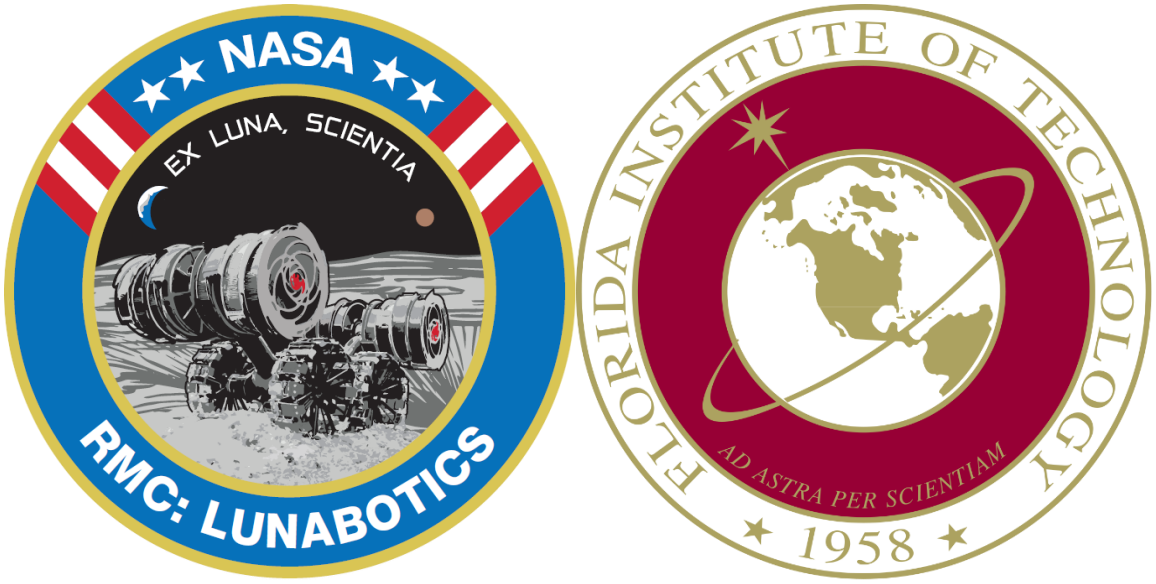


General Operator: Manual Control via Xbox Controller

- Connectivity: The Xbox controller's built in Bluetooth requires disabling of ERTM for use on computers. To temporarily enable Bluetooth connectivity between the controller and the Jetson, enter the following commands on the local terminal:
    - sudo -s
    - echo 'Y' > /sys/module/bluetooth/parameters/disable_ertm

Then reboot the system. Or to disable ERTM permanently:

- sudo nano /etc/modprobe.d/Bluetooth
- conf
- options Bluetooth disable_ertm = Y

Electronic Configuration: Manual Control via Xbox Controller

Developer: Movement and Controller Code Guide

The code that controls the movement of the robot and it's components as well as the code for the Xbox controller are stored on a NVIDIA Jetson TX2 attached to the robot.

- To navigate to the movement code stored on the Jetson:
  - Gpio/servo…/`Jetson…/Python3

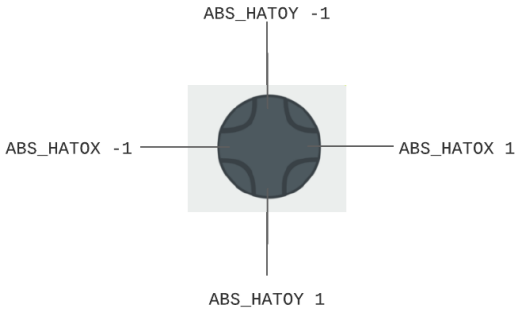
- Key variables:
  - setPWMFreq
  - setPWM
  - setServoPulse – duty cycle
  - exit_PCA9685 – to exit and kill
  - setRotationAngle (pin number, duty cycle)

- Setting rotation angle:
  - Full reverse – 10
  - Partial reverse – 50-100
  - Partial forward – 100-150
  - Full forward – 150

The code for the Xbox controller implements I/O via Python-evdev for events indicated by pushing buttons on the controller.

- To navigate to the controller code stored on the Jetson:
  - cd/…cd dev…cd input evdev

- While loop continuously detects input from controller; i.e while the button is pressed a signal is being sent



- To create a test code to send different signals to motors:
  - Navigate to setup instructions in the same directory and follow the steps

- To control robot with the Xbox controller, run the evdev tester to get the specific codes for each button
    - python3 -m evdev.evtest