Section 2 Team 2

Hardware Components

Robot Chassis

- 1 x Back plate 1
- 1 x Bottom connector
- 1 x Bottom back assembly
- 1 x Bottom front assembly
- 1 x Front plate Unit
- 1 x Left back wheel assembly
- 1 x Left front wheel assembly
- 1 x Right back wheel assembly
- 1 x Right front wheel assembly
- 2 x Side connectors
- 1 x Top connector
- 1 x Upper back plate
- 1 x Upper front Unit
- 1x Chest piece
- 1x Head Unit
- 4 x 60mm Omni Wheels
- 1 x Shield Assembly

Computer Modules

- 1 x Raspberry PI 4
- 1 x Jetson Nano
- 1 x Arduino Uno

Motors & Actuation

- 4 x Vex Motor Modules (wheels)

- 1 x Servo Module (Laser)
- 1 x Servo Module (Shield)
- 1 x Motor Control Board (Daughter Board)

Sensors

- 1 x Kinect
- 1 x Ultrasonic Sensor
- 1 x M5CoreS3 (Sensor Suite)
  - Camera
  - Magnetometer
  - Accelerometer
- 1 x Solar Panel

Power & Supporting Electrical Components

- 1 x 12V/5V battery pack
- 1 x Voltage ADC
- 1 x Relay Switch
- 2 x Mini-breadboards

Team Member Contributions

Joe

- Setup and tested all hardware that interfaces with the to the M5CoreS3:
  - Laser
  - Solar Panel
  - Relay
  - Ultrasonic Sensor
- Wrote UI Flow and Micropython Code to gather and display data from the M5CoreS3
- Setup the I2C protocol all sensor data will communicated through
- Tested and connected the laser through the relay to isolate it from being powered by the computer modules

- Reworked github into a clean directory structure

Clay

- Printed and assembled all 3d components
  - External panels
  - Wheels
  - Top section
- Designed and implemented all mount points for sensor hardware
  - solar panel mount point and enclosure
  - Kinect mount point
  - laser mount point
- connected and tested all motors and servos
- wrote and implemented initial movement code
- Painted all hardware component parts
- Began implementing low level code for positioning and translating robot

Syed

- Setup YOLO on the Jetson and raspberry pi
- captured photos and preprossessed images for all game objects:
  - Robots
  - Cones
  - Target
- Worked on setting up path planning algorithm with teammates
- Pair Programmed occupancy grid with team mates
- Programmed and analyzed Lidar data
- worked on setting up Mongo docker container

Katherine

- Implemented laser detection algorithm
- Tested Code on the hardware in various ambient lighting scenarios
- Researched Various laser filters to increase detection probability
- Photographed robot from various angles for training YOLO

- Helped create GUI implementation

Fernanda

- Helped create GUI implementation
- Helped capture of cones for YOLO
- Researched various laser alternatives optimizing for detection

Aaron

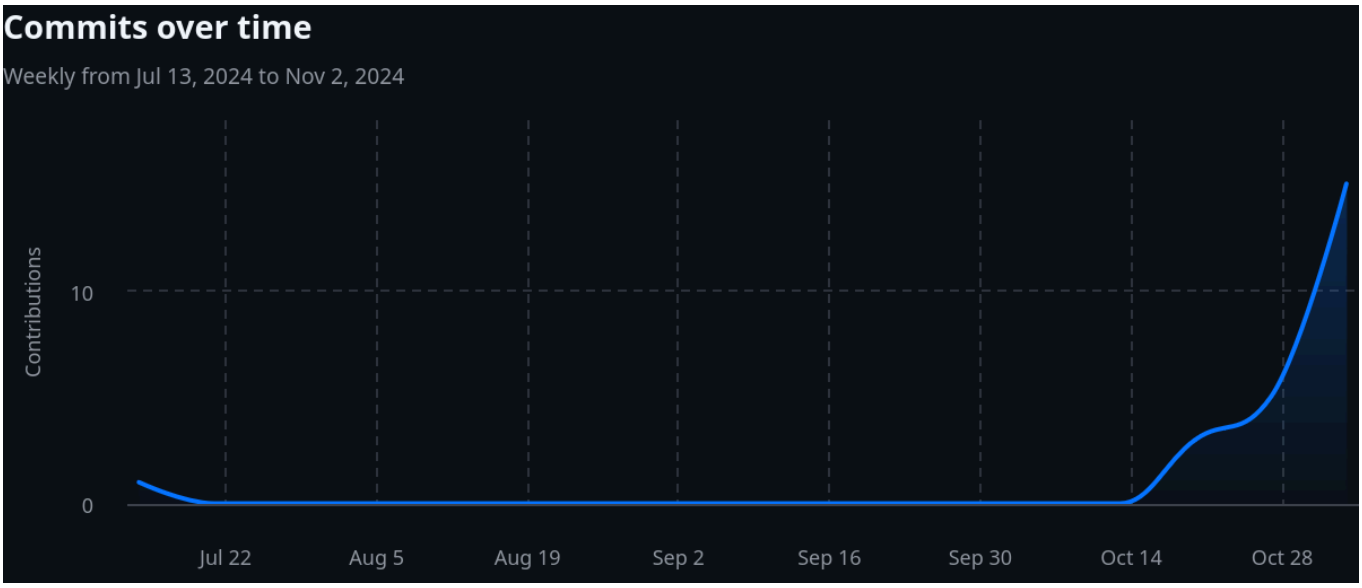
- Installed and built Freenect for interfacing with Kinect and installed dependencies
- Capture photos (for YOLO) of
  - target
  - cones
- Wrote and tested code for getting distance from objects bounded by a region within a frame (for use with YOLO)
- Created the initial version of the path planning algorithm our robot will use (custom A*) and began implementation
- Helped set up Mongo docker container
- Rewrote initialization bash script to include checks for newly implemented features
- wrote test scripts for webcam and Kinect
- worked on setting up Mongo docker container

Github

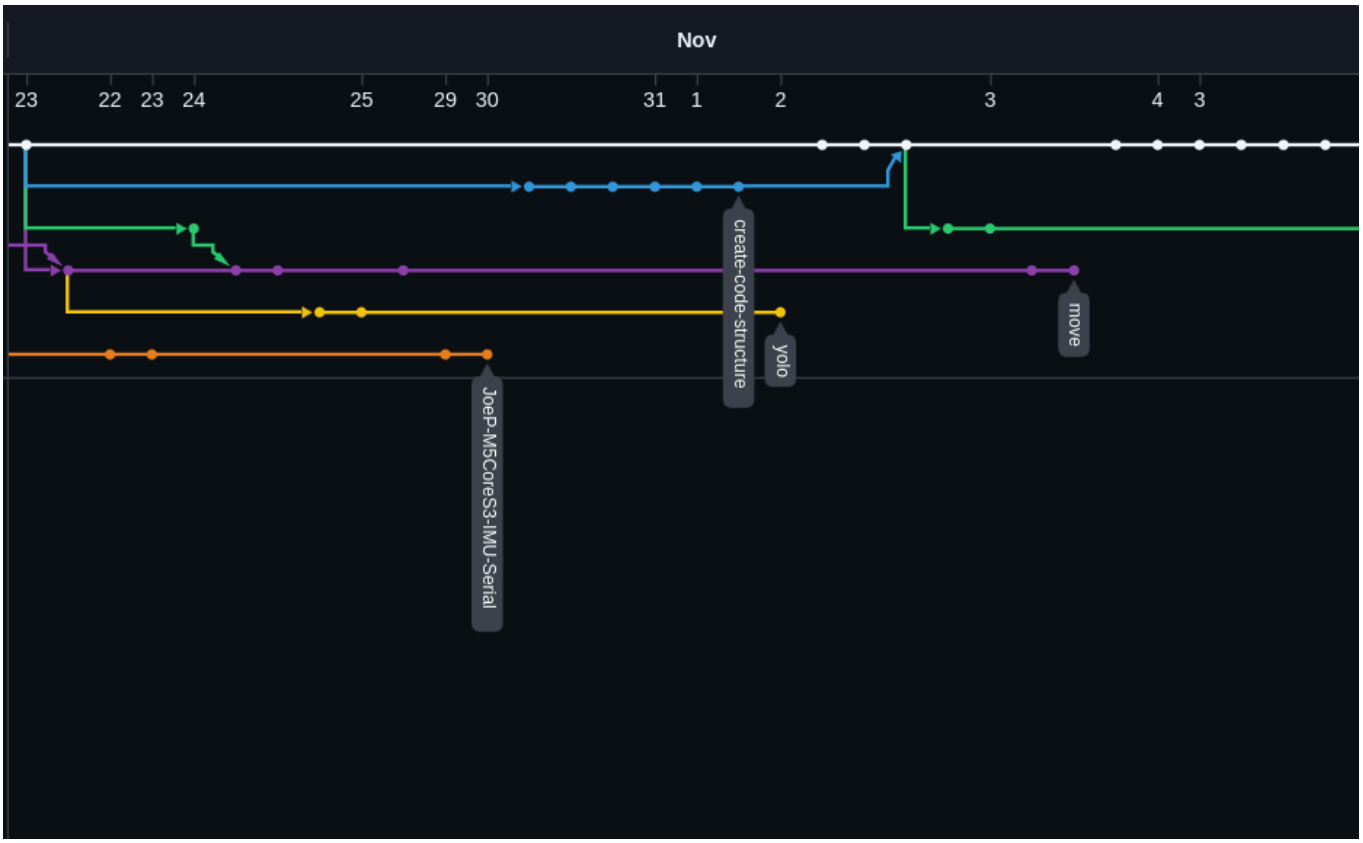
Repository Activity

Excluding merges, **8 authors** have pushed **26 commits** to main and **58 commits** to all branches. On main, **143 files** have changed and there have been **34,363 additions** and **1 deletions**.

Commits Over Time



Network Graph (Oct 23 - Nov 7)


Nov
23
22
23
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1
2
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4
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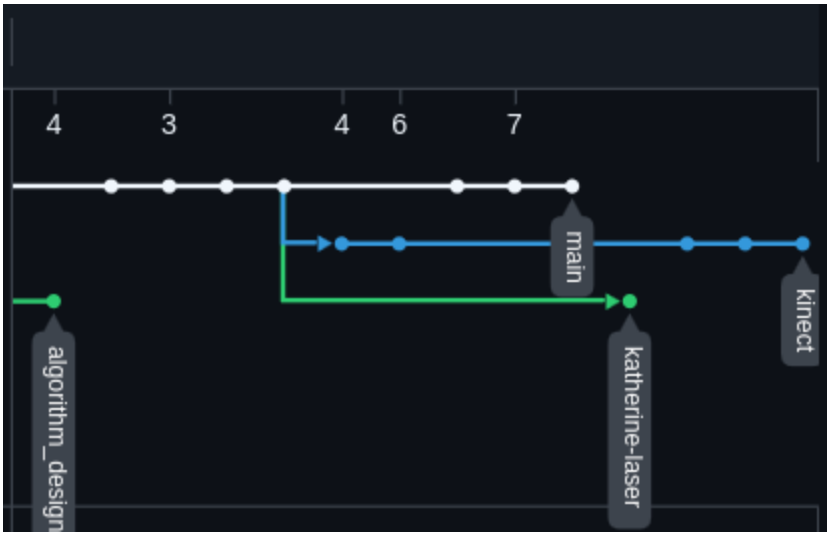
create-code-structure
yolo
move
JoeP-M5CoreS3-IMU-Serial


4
3
4
6
7
main
kinect
algorithm_design
katherine-laser

8