



Explorer Post 1010
Shady Grove MD, USA
"Home of Logic"





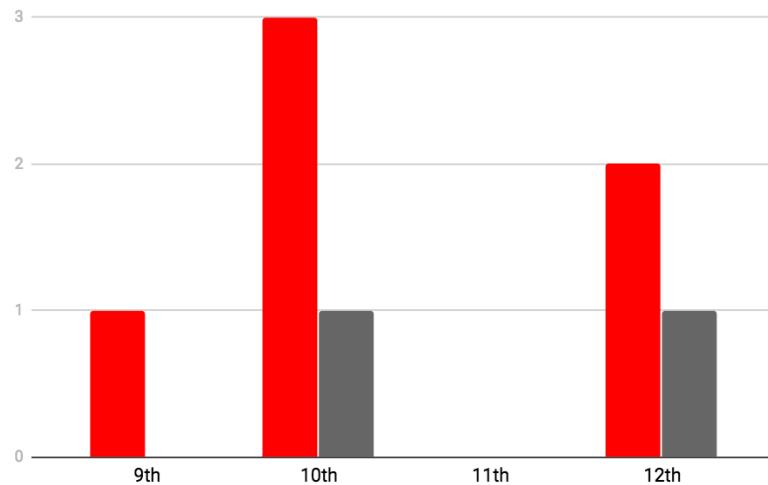
Gender Split:

Boys: 75% (6), Girls: 25% (2)

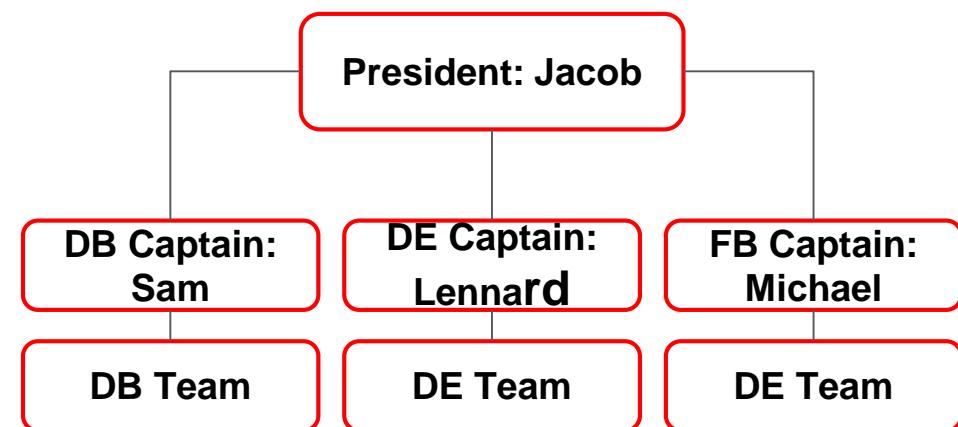
Grades:

9th: 1 10th: 4 11th: 0 12th: 3

Member Demographics



Team Breakdown





Meetings

Location: Johns Hopkins, 9601 Medical Center Drive

Non School Based Team

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
4 - 9pm	4 - 9pm	4 - 9pm	4 - 9pm	4 - 9pm	10am-5pm	n/a



Goals and Strategies (structure)

Cycle 1: Concept

- Plan (the build and the path)
- Create (Build Robot; Code Effectors and Movement functions)
- Execute (testing period)

Cycle 3 : Upgrade

- Plan (only small plan tweaks)
- Create (only minor build / code changes)
- Execute (testing period)

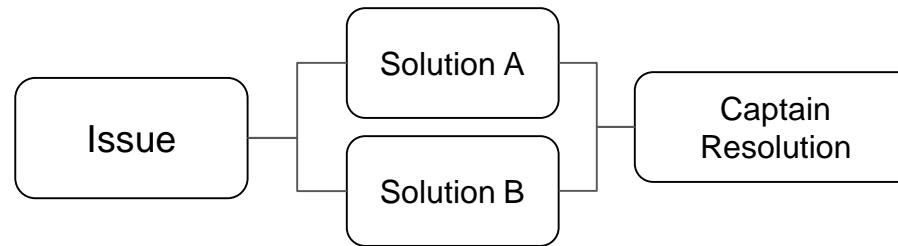
Cycle 2: Update

- Plan (rebuild what could be better; update path)
- Create (Update Robot; Code Effectors and Movement functions)
- Execute (testing period)

Cycle 4: Competition

- Plan (identify what doesn't work/is risky)
- Trim (get rid of anything that doesn't work)
- Test (practice running tournament style)

Conflict



- Issue: Motors breaking due to jerky movement
- Proposed Solution (Michael): switch to a ramp up for motor movement
 - downside: program takes longer to complete
- Proposed Solution (Ilan): Assume risk and use spare motors
 - downside: costly
- Captain decision: Instead of deciding between one of solutions an alternative is made. The ramp up is implemented to keep costs down, but blue pom segment of code is removed.



Goals and Strategies (fill)

Cycle 1: Concept

- Build robot to first collect blue and then orange poms
- build a structure which allows for holding all blue poms at once
- Test out the blue pom and orange mechanisms

Cycle 2: Update

- Upgrade blue pom mech. so only pom could be released at a time
- Use directional changing gears to use one motor for entire mechanism
- Test effectiveness of spitting one pom at a time

Cycle 3 : Upgrade

- Extend the bots path to cover both sides of orange
- code to follow line to other half of board
- test path

Cycle 4: Competition

- ~~- Realize that run takes over two minutes~~
- Cut out entire blue pom mech due to time constraints
 - Stress test to find breaks pre competition

Division of Labor

My Tasks Inbox Dashboard + Search Help L

GCER

Board Timeline Calendar Conversations Progress Files

Show Project Description

Base 1 Bot

Base 2 Bot

Blue Pom Bot

DE Bot

Yesterday

Overview

Complete Phase 1

Complete Phase 2

Complete Phase 3

Complete Phase 4

Jun 27

Jul 11

Jul 18

Jul 22

Overview

Complete Phase 1

Complete Phase 2

Complete Phase 3

Complete Phase 4

Jun 27

Jun 27

Jun 27

Jun 27

Le

Overview

Complete Phase1

Complete Phase 2

Complete Phase 3

Complete Phase 4

Jun 27

Jul 11

Jul 18

Jul 22

Mark Complete

Complete Phase 1

Unassigned

Due Date: Jun 27

Description

GCER - Blue Pom Bot

Plan

Create

Execute

Jacob created task. May 29
Jacob added to GCER. May 29
Jacob changed the due date to Jun 13. May 29

Michael Jun 13
Kind of got it done. Today, got 3 tapes a few times, but most of the time got two. Strange change in behavior towards the end of the meeting.

Ja Write a comment...

Followers + Following

Update Status

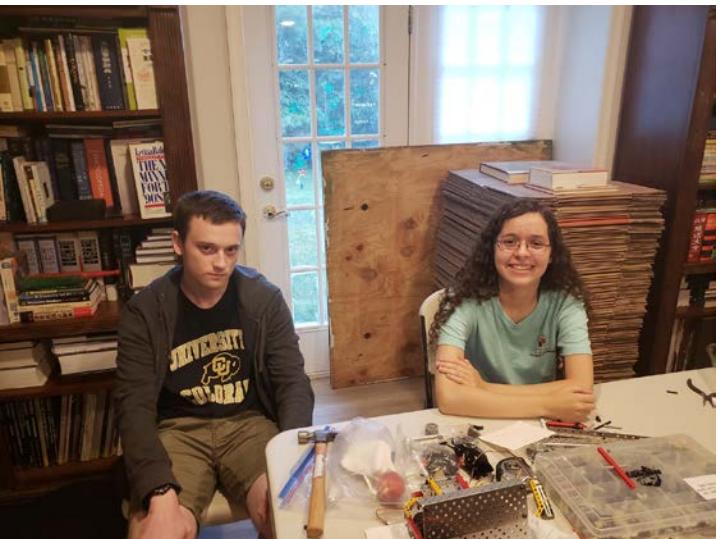
What's new with this project? Is there an update that all members should know about?

Chase will be notified. Add more project members.

Remind me to update the status every Friday



Solid Bot





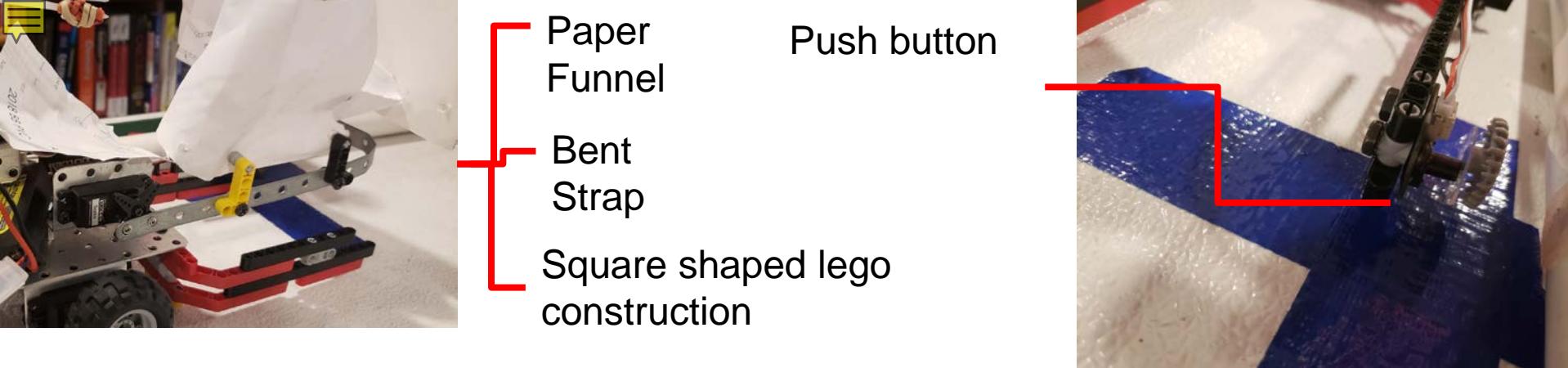
Base: is a chassis with a motor on both sides with two wheels secured onto the motors with the use of a servo horn.

Effectors:

- The metal strap is bent and attached to a servo, which is used to secure the bin we use to capture orange poms
- Zip ties attached to an axle spins in full circles because of the third motor, which knock down the poms
- Paper is attached on all sides to the strap in order to make sure poms go into the bins when knocked off frisbee
- Attached to the chassis the square shaped structure with two low lego walls on both sides, used to push the bin without it moving from side to side

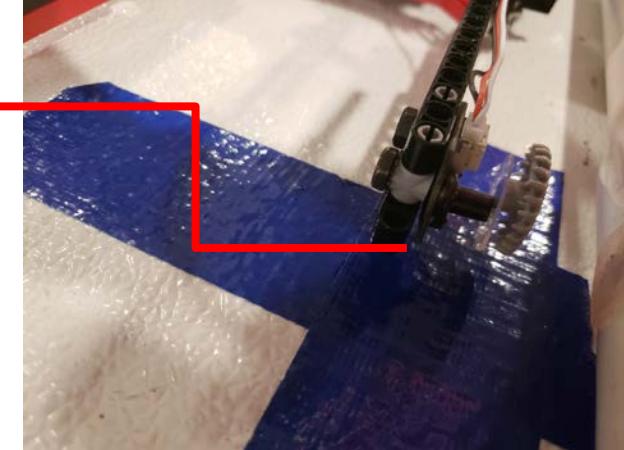
Sensors:

- On the end of one of the sides of the ~~square shaped structure~~ is a push button with a tooth crown used to wall follow
- On the structure closer to the chassis is a single top hat sensor used to line follow
- ET sensor is placed on the chassis to find the pvc which has the orange poms

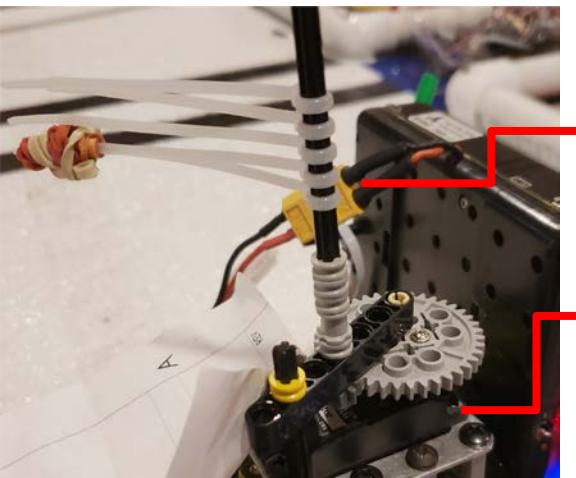


Paper Funnel
Bent Strap
Square shaped lego construction

Push button



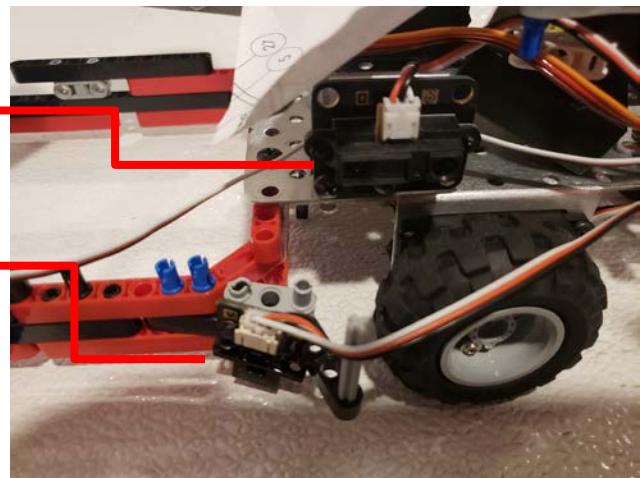
Design



Zip ties spin
Motor that spins axle

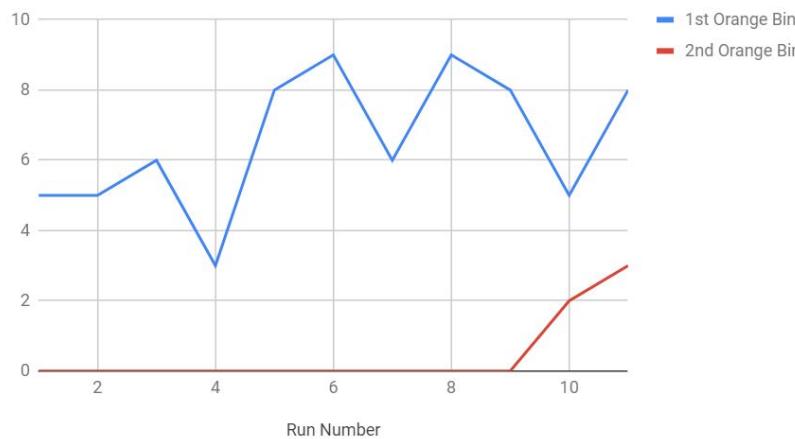
ET (Depth) sensor

Top Hat Sensor



Data of Runs Made by Solid Bot

1st Orange Bin and 2nd Orange Bin

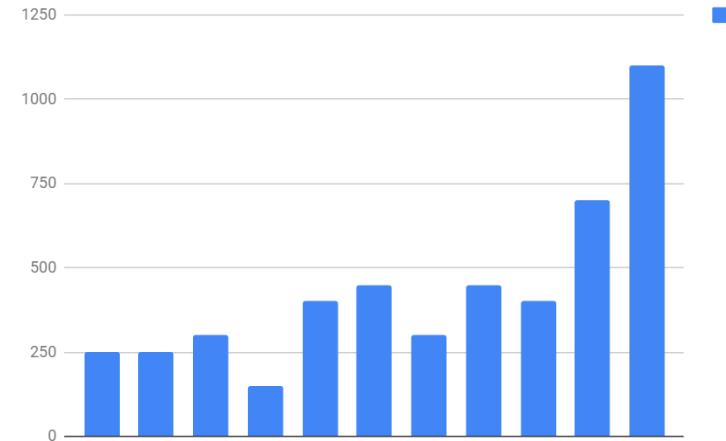


Mean(Total pom amount): 7

Poms

Bin1: Min 3, Max 9

Bin2: Min 0, Max 3



Mean(Total Point amount): 432.818 pts

Min: 200

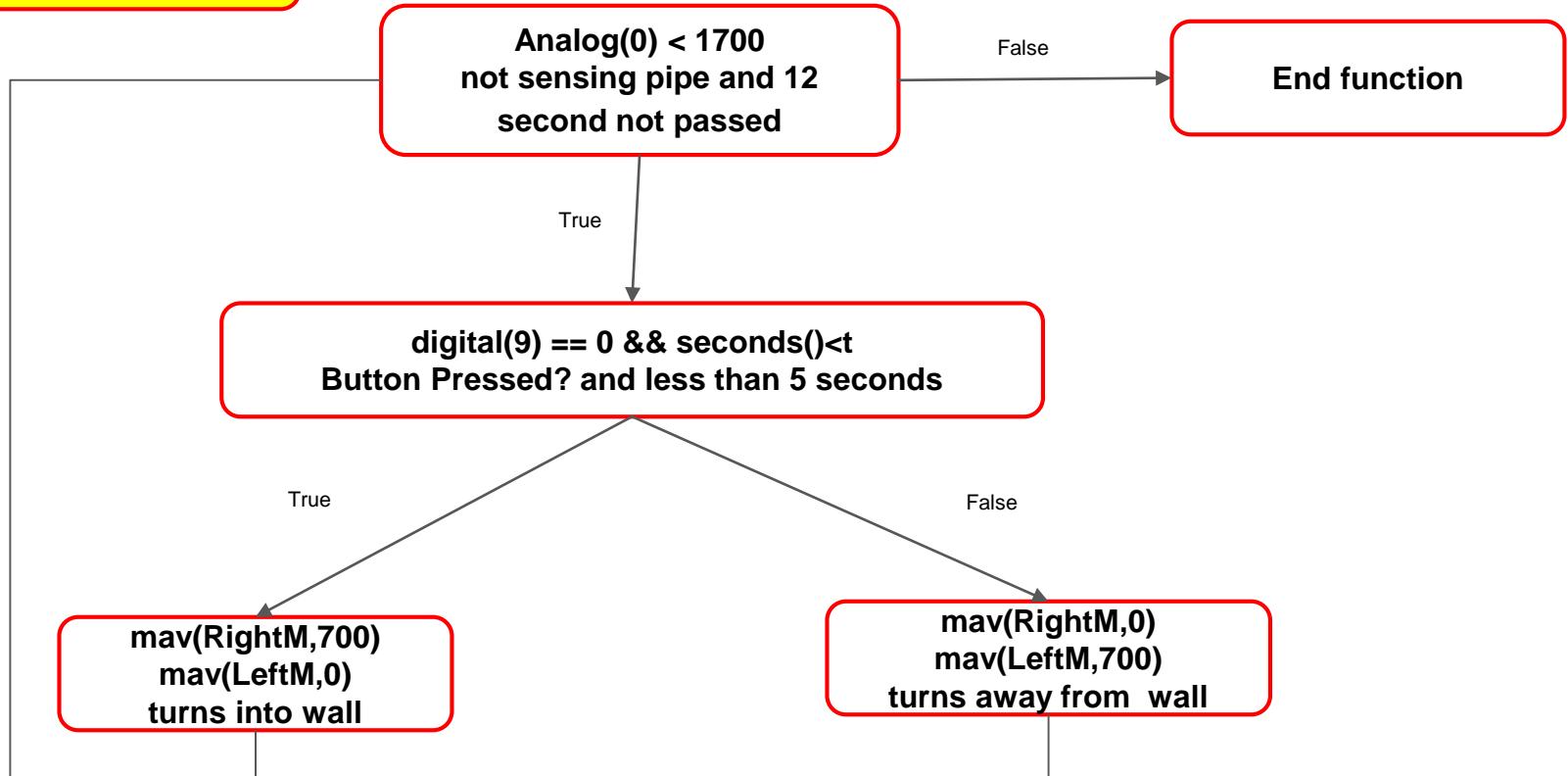
Max: 1100



Code from the Solid Bot

```
void wallFollow() // function used to wall follow
{
    int secs=seconds()+12;
    while(analog(0)<1700&&seconds()<secs) //While Depth sensor does not reach pipe
    {
        int t=seconds()+5;
        while(digital(9)==0&&seconds()<t) //loop inside loop continues for 5 seconds and
                                                //while pushbutton is not pressed
        {
            mav(RIGHTM,700); //robot slightly turns to the left toward the wall
            mav(LEFTM,0); // the right motor is turning forward at the speed 700, left motor is at 0
        }
        mav(RIGHTM,0); //robot turns to the right away from wall for 500 milliseconds
        mav(LEFTM,700); // the left motor is turning forward at the speed 700, right motor is at 0
        msleep(500);
    }
}
```

Objective: Reach Last Frisbee





The Paper Funnel

- The square shaped structure was used to push the bin, which collects the orange poms
- The bent strap effector connected to the servo was used to secure the bin from all sides while moving
- The poms that would be knocked off the frisbee by the effector of zip ties attached to an axle, spun by a motor, would not fly into the bin
- Solution: Paper was attached to the base, both sides of the strap, and on one side of the lego square shaped structure to direct the poms flying around the bin, to be directed into the bin, hence a funnel



Finding the Pipes

- The depth sensor originally was programmed to look for pipes at a certain distance and then activate a stop function for the bot to collect the poms
- Problem: The depth sensor would vary too much in looking for a specific value
- Solution: Instead of looking for a specific value, the code was changed to look for a relative change in the distance seen by the sensor



Insta

