

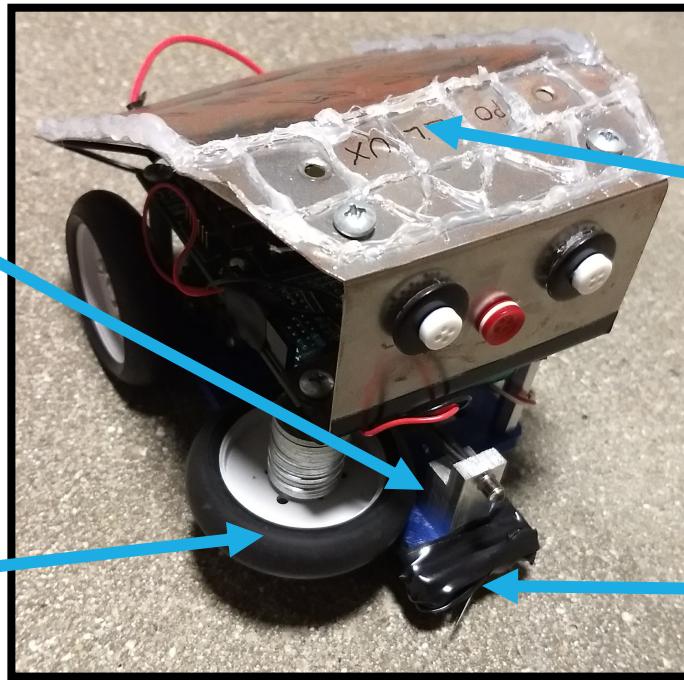
GEMINI


DAPHNE POON AND ADITYA KHANT

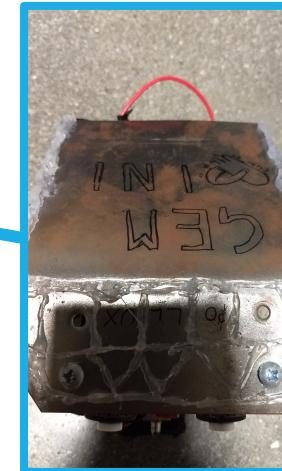
Features on the Side Robot (Pollux)



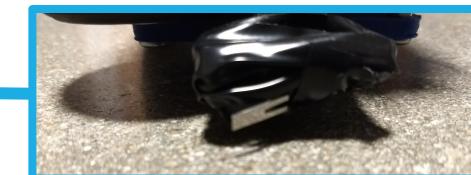
Original photosensor



A wheel was used as a
Wall - Hugger



A ramp was used
to launch the
center robot
(Castor)



A limit switch to sense
when the robot bumped

```

void setup() {
    // put your setup code here, to run once:
    long startTime = millis();
    bool letsReturn = false;
    Serial.begin(9600);
    pinMode(3, INPUT);
    pinMode(boopPin, INPUT);
    pinMode(boopOut, OUTPUT);
    digitalWrite(boopOut, HIGH);
    digitalWrite(4, OUTPUT);
    whendifwestart = millis();
    isWhite = digitalRead(3);
    initMotors();
    //initUS();
    setupMove();
}

void loop() {
    workingWithReturn();
}

void workingWithReturn(){
    while (!detectGoldCode() and !digitalRead(boopPin)) {
        motorControl(255, 240);
        returnStrat();
    }
    if (detectGoldCode() ) {
        returnStrat();
        runaway();
    }
    if (digitalRead(boopPin)) {
        halt();
        while (digitalRead(boopPin)) {
            motorControl(255, -255);
            delay(400);
        }
    }
}

void runaway(){
    halt();
    motorControl(0, 255);
    delay(450);
    motorControl(255, 200);
    delay(1500);
    halt();
}

void returnStrat() {
    if (millis() - whendifwestart > returnTime) {
        if (!isWhite) {
            if (D2 == 2 and abs(D1) > returnCor) {
                while (true) {
                    halt();
                }
            }
        } else {
            if (D2 == 4 and abs(D1) > returnCor) {
                while (true) {
                    halt();
                }
            }
        }
    }
}

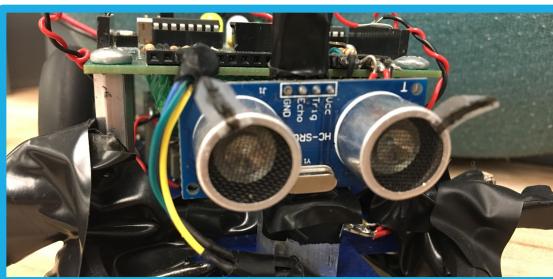
if (abs(D1) > 30 and D2 < 5) {
    if (color == 'w') {
        if (isWhite) {
            return false;
        } else {
            return true;
        }
    } else if (color == 'g') {
        if (isWhite) {
            return true;
        } else {
            return false;
        }
    } else {
        return false;
    }
}

```

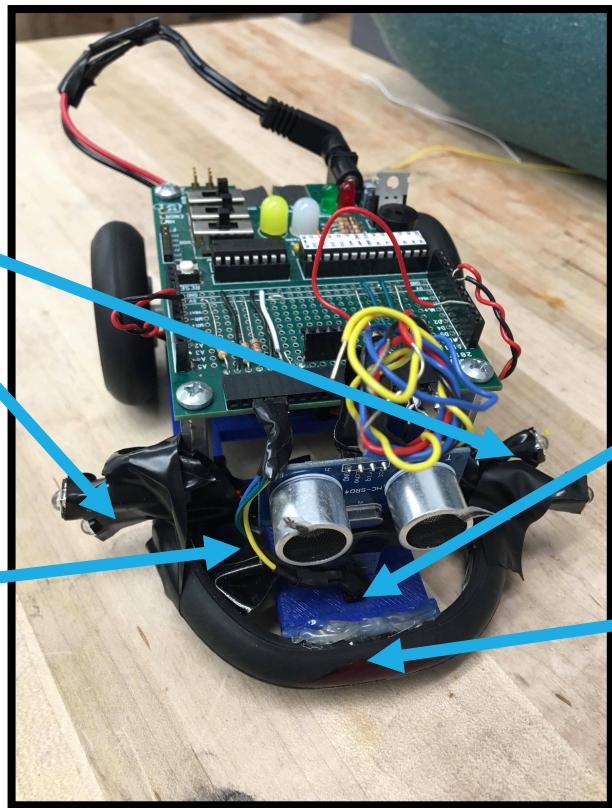
Features of Center Bot (Castor)



2 LEDs on each side



Attempt was made to use
ultrasonic distance sensor



Original reflectance sensor



Cut tire acts as bumper

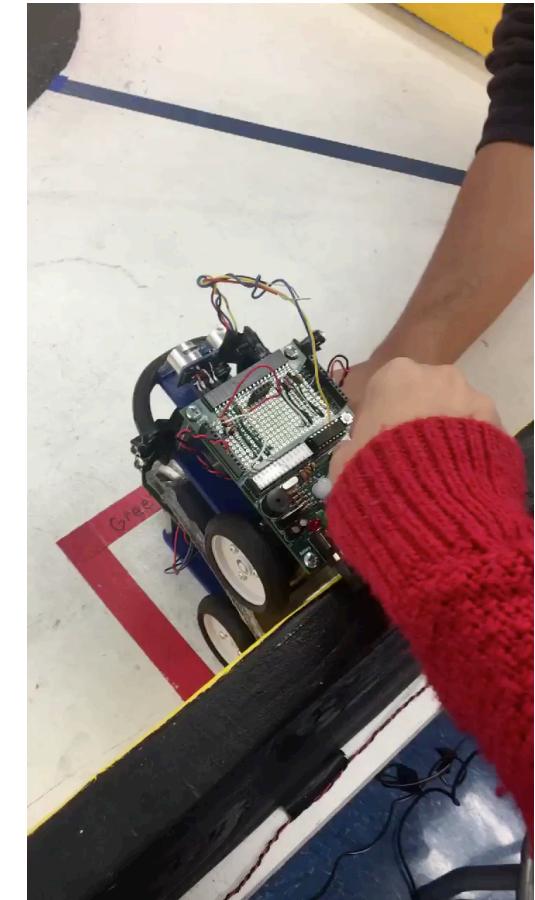
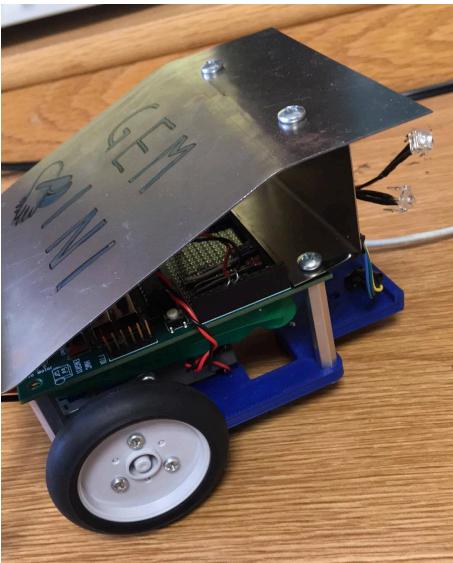
```
void setup() {  
    // put your setup code here, to run once:  
    Serial.begin(9600);  
    initMotors();  
    gcsetup(); //sets up the gold code  
    jumpoff();  
    fwd();  
    halt();  
    delay(5);  
}  
  
//  
  
void loop() {  
    turnonblack();  
    turnonwhite();  
}
```

```
void turnonblack(){  
    pinMode(REFLSENSOR, INPUT);  
    while(analogRead(REFLSENSOR-14) > 315){  
        //motorControl(130,65);  
        //motorControl(120,55);  
        motorControl(120,60);  
        //motorControl(140,60);  
        //motorControl(150,75);  
        //motorControl(240,120);  
        gcloop();  
        //calcDist();  
    }  
    halt();  
}
```

```
void motorControl(int y, int z){  
    analogWrite(LEN, y);  
    analogWrite(REN, z);  
    digitalWrite(LPLUS, HIGH);  
    digitalWrite(LMINUS, LOW);  
    digitalWrite(RPLUS, HIGH);  
    digitalWrite(RMINUS, LOW);  
}  
  
void gcloop() {  
    if (invertBits == false){  
        for(int i=4; i<8; i++)  
        {  
            for(int y=0; y<2; y++) //loops gc twice  
            {  
                for(int z=0; z<31; z++)  
                {  
                    long startTime = micros();  
                    while(micros() - startTime <= 250)  
                    {  
                        if (goldCodes[i][z] == 1)  
                        {  
                            digitalWrite(LED1, HIGH);  
                            if (goldCodes[8][z] == 1){  
                                digitalWrite(LED2, HIGH);  
                            }  
                        }  
                    }  
                }  
            }  
        }  
    }  
}
```

Issues and Troubleshooting

- Ramp and Launch
- Side Robot Getting Stuck
- Returning back to the base in Time



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