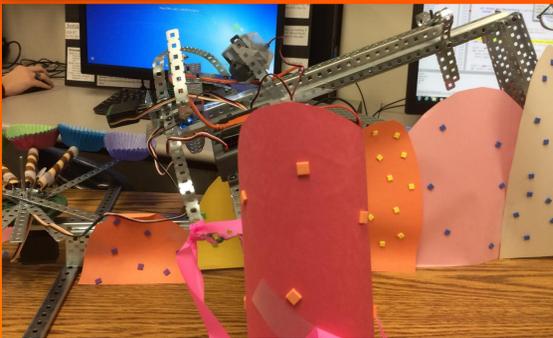
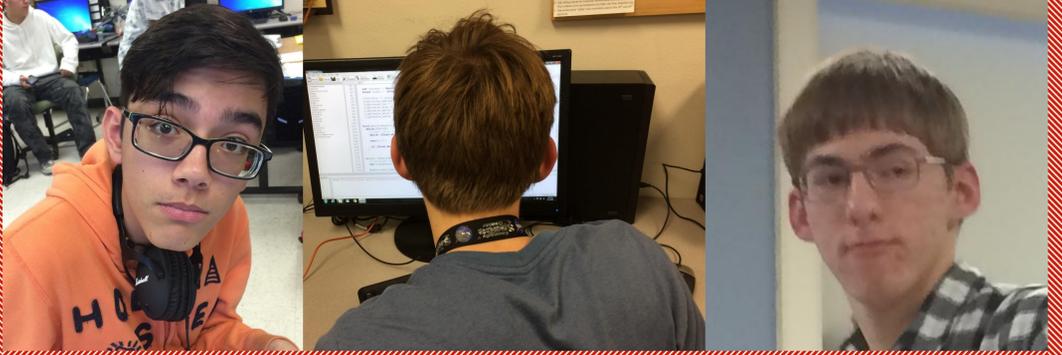


CANDYLAND Marble Sorting Challenge

Challenge: Separate a total of 25 marbles into 5 different bins based on type. Can you make a robot that does it in under 2 minutes?

Kaden Garcia
Jacob Valdez
Isaac Valdez



The finished robot

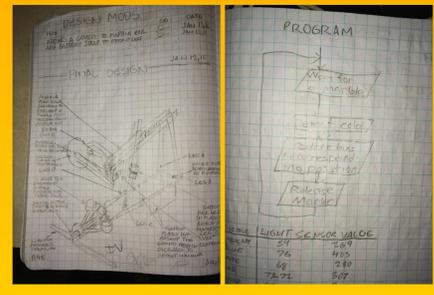


5 different cups for 5 different kinds of marbles

It is humbling to consider the relationship between a man's thoughts and what he does. Through the course of this project, our group has acquired a humble attitude towards robotic development. We spent much time working on the first design of our robot, which ended up being dismantled to produce a similar second design of our robot. This first robot and second were largely similar in design and functionality because after the engineers' having conceived, approved, and begun work on the first robot idea, their mindset was fixed on it, so rebuilding the robot only took more time than necessary while yielding the same results. The fruitage we yielded, of course, was the dysfunctional robot. The code for the program also had to be rewritten, though containing few errors, still could not breath life into what Death had already claimed (Basically, no matter how amazing the program was, the robot still didn't work). That is why we did not accomplish our purpose of create a marble sorting robot. We did, however, learn many things: First, as mentioned before, we now know that we don't know how to build VEX™ robots. Second, we should not have tried to rebuild the same robot. Third, we should have experimented with the different sensors to find out how they could be used to sort marbles. Finally, experience in using the various VEX™ parts and sensors would have given us more, well experience in building our robot.

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1 #pragma config(sensor, int), lightsensor, sensor[analog]
2 #pragma config(motor, port), bucket[robot], factor[servoStandard], open[on]
3 #pragma config(motor, port), door[open], factor[servoStandard], open[on]
4 //Project title: Marble Sorter
5 //Project name: team name, team
6 //Date: January 14, 2014
7 //Project goal: Sorts different marbles based off of their light intensity reading
8 //Description:
9
10 //wait 10 seconds
11 //adjust the pre-programmed light values proportionally to match the current ambient light sensed
12 //loop all of this:
13 //open marble door
14 //wait for the marble to enter the door
15 //read the marble intensity value
16 //find a proportion based on the marble intensity reading compared to the ambient light value
17 //move on the rotation of the propertion, identify the marble as red, blue, white, wood, or metal
18 //rotate the marble bin to the appropriate marble bin
19 //open the marble door to allow the marble to fall into the bin and restart from "loop"
20 //
21 //
22 int tolerance = 30;
23 int lightvalue_ambient = 250;
24 int lightvalue_red = 280;
25 int lightvalue_blue = 300;
26 int lightvalue_white = 31; // we missed up not supporting the white marble
27 int lightvalue_wood = 380;
28 int lightvalue_metal = 390;
29
30 typedef int Marble; // marbles are just integers that represent the index of the marble
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1 // This routine captures the coordinates that contain the light sensor
2 // and the marbles to that the light values for the marbles are adjusted
3 // to match the environment in which this robot's code is executing.
4
5 int current = sensorValue[lightSensor];
6 float scale = (float)current / (float)lightvalue_ambient;
7
8 tolerance *= scale;
9 lightvalue_ambient *= scale;
10 lightvalue_red *= scale;
11 lightvalue_blue *= scale;
12 lightvalue_white *= scale;
13 lightvalue_wood *= scale;
14 lightvalue_metal *= scale;
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Left: final design on paper
Right: Program complex behavior

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1 task main()
2 {
3 //close the door
4 setServo(doorOpener, door_angle_closed);
5
6 //position the bucket rotor to its default position so that later movements will occur faster.
7 positionBucketRotorToDefaultPosition();
8
9 //adjust the tolerance by light value perceived
10 adjustConfiguration();
11
12 //loop forever
13 while(ROVER) {
14 //add a new marble
15 waitforMarble();
16
17 //identify which marble it sees and store it in the variable "marble"
18 Marble marble = identifyMarble();
19
20 //adjust the bucket rotor to its default position so that later movements will occur faster.
21 positionBucketRotorToDefaultPosition();
22
23 //release the marble
24 selectTucket(marble);
25
26 //release the marble
27 releaseMarble();
28
29 }
30
31 void adjustConfiguration() {
32 //adjust the tolerance by light value perceived
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