

Robot Design
Andrew Camargo
Palm Desert Charter Middle School

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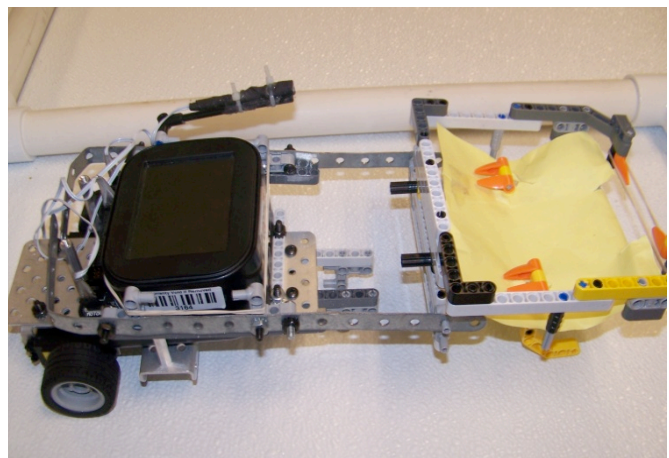
When you design your robot to do a specific task, a mechanical solution that doesn't involve motors or programming is probably the best option.

Introduction

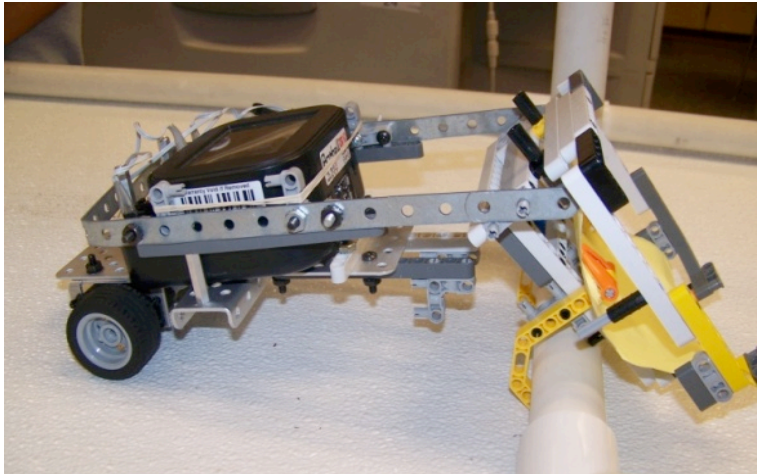
Botball is a fantastic program that allows 6th through 12th graders of both genders to be their self and learn how to be organized, how to program, and most importantly, in my opinion, how to build and work as a team. I believe that building is the key to a superior robot, because without a sturdy and functional design you do not have a working robot no matter how well the program is written. No one is perfect; it takes a whole team to build a high-quality robot. The team should have a person designing the robot, another person looking for the parts, and then the “initial” builder, the person who puts the parts together according to the designer’s ideas. After all the work is done, who gets the credit? The team does, since every person had their own division of labor.

My Team’s Robot Design

Robotics teacher and Botball coach at Palm Desert Charter Middle School, Mr. Reginald Clark, saw our team having trouble deciding how to build a robot that will collect and dump the “biofuels”, and gave us an idea. He said that building a mechanical solution that didn’t use a motor or programming was always a good option. So we came up with an idea. It was a robot that had a basket loosely attached that would tip over when bumping into the PVC pipe leading the biofuels to fall into the assigned section. We worked along with his magnificent idea and in no time we had a working robot. In picture 1, you can see our finished robot.



Picture 1: Our robot*

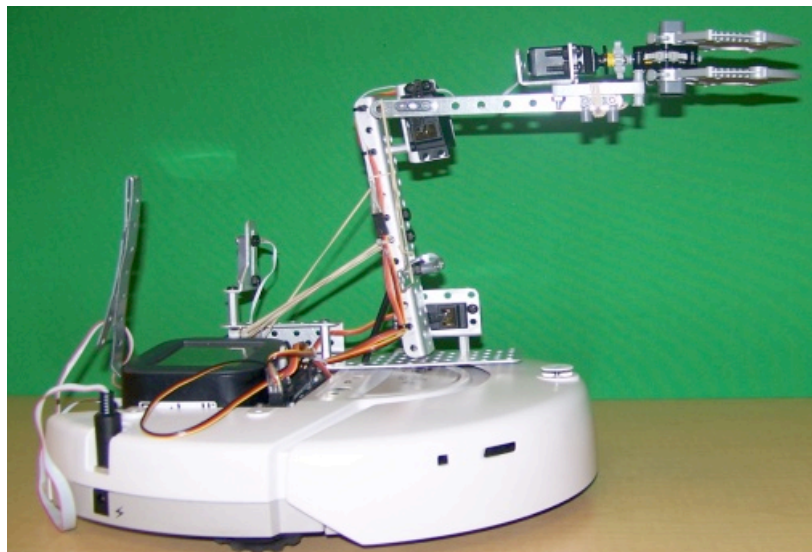


If you look at Picture 2, you will see a picture of my team's robot tipping over the PVC pipe and if the biofuels were in the basket, they would have rolled into the biofuel storage. What I think is amazing and interesting about our robot is that our robot doesn't have servos, just a light sensor and two motors.

Picture 2: My team's robot driving towards the biofuel storage*

Team 11-0035, also a team from Palm Desert Charter Middle School, and their robot inspired our team. So after getting permission from their team, we copied (not piece by piece) their robot. We made our own version of the design that would work for our team and our strategy.

One thing we changed was the claw. They used two servos to lift their claw but instead of using two servos, we used a motor and a worm gear. Also, we used four claws in the grip instead of two. In picture 3, you will see a picture of our Create robot.



Picture 3: Our Own Create Robot*

Good Building Strategies

The key to building an outstanding robot is simple. Be organized.

Being organized makes building a robot faster and easier. For example, if you have all your kit pieces neatly organized, it won't take forever to find that finishing piece, instead of just looking for its spot in the tool kit. In picture 4, you will see our team's organized kit. Also, it's good to have every single person on your team assigned a job such as head builder, assistant builder, robot designer, piece/part finder, and so on. It is also good for your robot to have a good base, or chassis, especially for robots that are not using a Create. I'd prefer using fully metal and avoid using UGlu, string, or paper for the base.



Picture 4: My Team's Organized Kit*

Future Building

Ever since I was little, I always wanted to build a robot to clean my room, but I never got to it, but now that I'm in Botball, I am one step closer. With the information I know now, such as, how to program, how to build, and so much more, I could build that robot. The iRobot Roomba already vacuums. If you just attached and programmed an arm you would have a robot that cleans your room. If you look at picture 5, it shows an iRobot Roomba. Although, I would use a Create instead of a Roomba to clean my room. I



Picture 5: iRobot Roomba*

would build a flexible arm with a strong grip so it can clean various items you would find in a room from clothes on the floor to dusting tall cabinets. I would build the claw using my own claw built out of a strong non-flexible metal, with an arm made of Botball metal, servos, and motors for the claw. Also, I would get a Create because that is what I can program to do my own project. Then get the Roomba's vacuuming mechanism and install it onto the Create and use a CBC to program the robot. It would look something like our team's Create robot.

What to Have “On Hand”

There are lots of necessary parts and tools to have “on hand.” Every part has a purpose, just like a team. All the parts have to work together to make a fully functional robot. Tools to have on hand are screwdrivers (flathead and Phillips), a hammer (to straighten metal), and a computer (to program). Also, important parts to have are all Botball kit pieces, rubber bands, extra screws, CBC download cables, and whatever else you think is good to have to keep your robots look good as new.

Conclusion

In conclusion, building has many different strategies, aspects, and parts, such as teamwork, cooperation, and determination. When put together incorrectly it makes a mess, but when put properly together they can make a fully functional robot.

Bibliography

*Pictures 1-4 are all original student photos from our room.

Picture 5 <<http://www.slipperybrick.com/wp-content/uploads/2007/08/irobot-roomba-560.jpg>>

iRobot, Create, Roomba <<http://www.irobot.com/>>