

Roots and Shoots

R.I.C. (Really Intelligent Cart)

A smart shopping cart, controlled from your phone via Bluetooth, to prevent the spread of COVID-19 and other diseases!



Marco Antonio Firebaugh High School

Victor Acuna - 12th Grade

Evelyn Miguel - 12th Grade

Wendi Aguilar - 12th Grade

Jimmy Gutierrez - 12th Grade

Linda Sciaroni - Advisor

Table of Contents

Problem Statement	3
Objective	3
User Requirements	3
Prototype	4
Budget Sheet (Prototype)	6

Problem Statement

Since the start of COVID-19, the number of people getting sick and sometimes even hospitalized has been getting worse and worse. The CDC recently reported a 107.2% increase in COVID infections around the world compared to July 2020. This is partly due to people coming in contact with objects that many people, who may have had COVID, touched. Ending COVID won't be easy, but we can help stop the spread by innovating existing problems. Shopping carts are used on a daily basis by thousands of people, hence making it a magnet for COVID to spread. So creating a contactless shopping cart is one big step we need to take to help stop the spread of COVID!

Objective

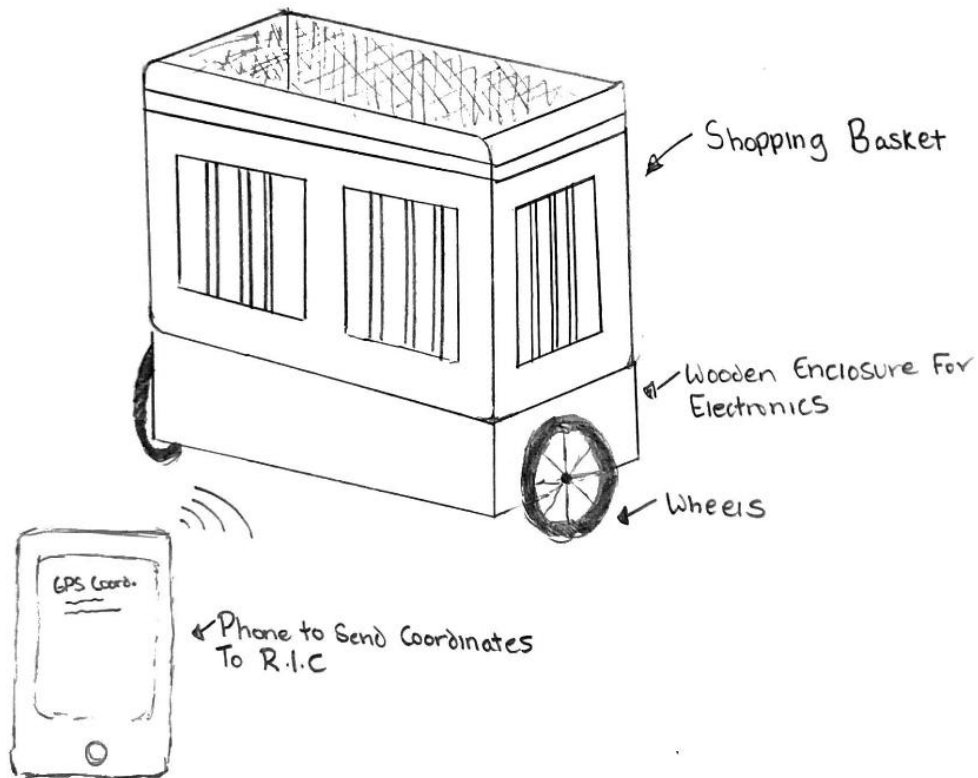
- To find a way to prevent the spread of COVID.
- To create a way to do contactless shopping so that everyone does not touch the shopping cart, which overall puts those people at risk of catching COVID.

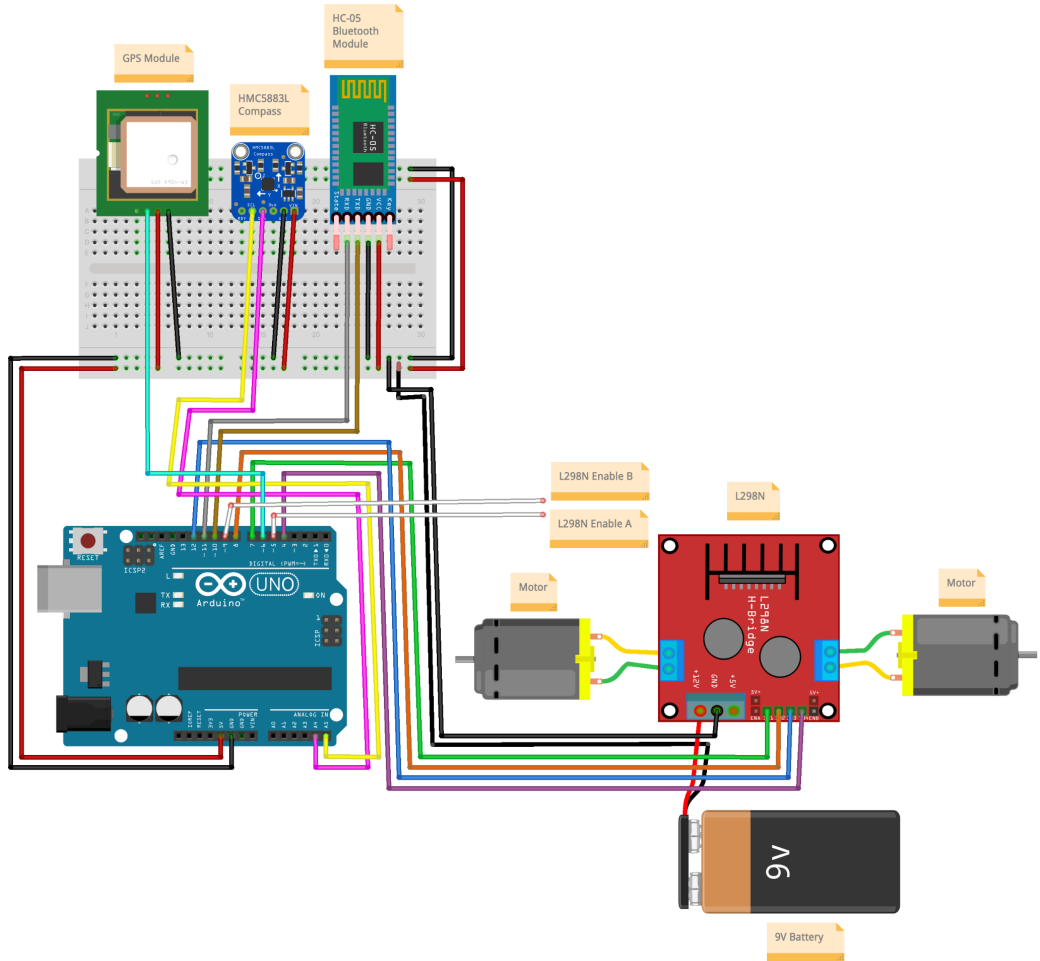
User Requirements

- To create an autonomous cart to allow for a hands-free shopping experience, and thus prevent the spread of diseases.
- To be as cheap as possible to allow for multiple carts to be purchased by store companies.

Prototype

R.I.C. (Really Intelligent Cart)





- The Really Intelligent Cart, or R.I.C. for short, is a smart shopping cart.
- Controlled by an Arduino Uno and powered by a 12V battery.
- Moves using 2 VEX motors.
- Follows the customer using their phone's GPS coordinates (which are detected with a GPS module and sent to the phone using an HC-05 Bluetooth module).

Budget Sheet (Prototype)

Part	Total Cost \$
Elegoo UNO Board	\$10.90
Breadboard 830 Point	\$1.65
HC-05 Bluetooth Module	\$2.33
L298N Motor Driver	\$1.34
9V Battery Button Power Cable Battery Buckle Snaps Power Cable Connector	\$0.13
9V Battery Snap Connector Clip with Wire Holder Cable Leads Cord	\$0.04
Male to Male Jumper Wires	\$0.16
Male to Female Jumper Wires	\$0.24
9V Battery	\$2.00
Obama Free Phone (Safelink)	\$0.00
Shopping Basket	\$27.10
NEO-6M GPS Module	\$11.59
ACROBOTIC QMC5883L Triple-Axis Compass	\$11.99
Strenco 2 Inch Hook and Loop Strips with Adhesive - 5 Yards	\$7.43
Hardwood Plywood Underlayment Specialty Panel 1/5 in. x 4 ft. x 8 ft.	\$22.38
VEX EDR Accessories - Motion - 4" Wheel (4-pack)	\$21.99
VEX 84T Gears (4-Pack)	\$14.49
VEX 2" and 3" Drive Shaft Pack	\$5.99
VEX Shaft Collars (16-Pack)	\$8.99
VEX Flat Bearings (10-Pack)	\$5.49
VEX Bearing Attachment Rivet (50-Pack)	\$8.99
VEX Steel Chassis Rail 2x1x25 (4-pack)	\$16.99
Total Cost	\$182.21