# Baby Wall-E

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# Motivation

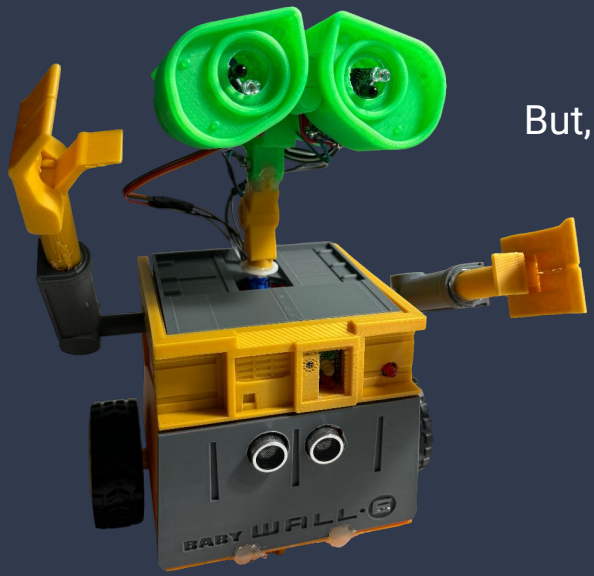
**Picture this:**

A world overflowing with garbage. Humans can no longer live on the planet. And we are in a giant spaceship in outer space, orbiting the Earth

# The Solution

## Baby Wall-E

# Baby Wall-E




But, can this Baby Wall-E actually shovel trash?

**Sadly no, not at this current state.**
**But, isn't he so cute?**

# Implementation

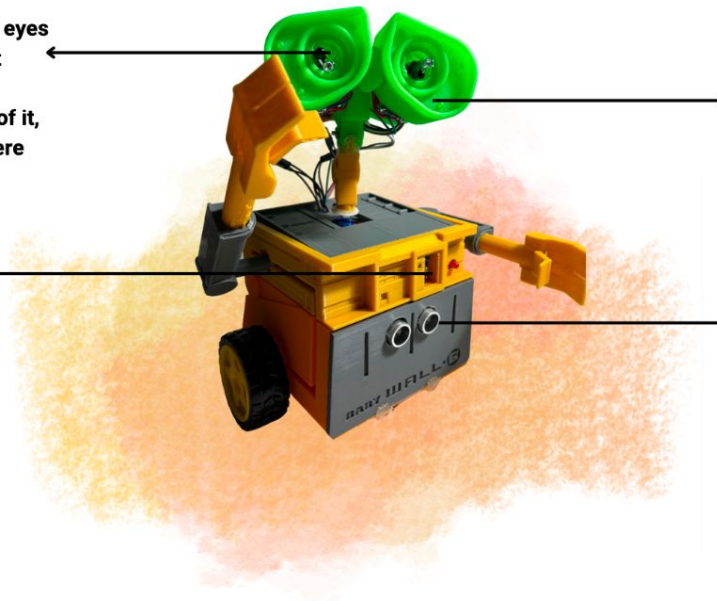
- We built an autonomous obstacle-avoidance robot. Also known as Baby Wall-E.
- Some major components:
  - Arduino Nano
  - Ultrasonic Sensor
  - DC Motors
  - Infrared Sensors

### Infrared Sensors (IR):

**These infrared sensors are installed on both eyes of Wall-E to allow it to detect movement that takes place in front of its face.**
**For instance, when a hand is placed in front of it, Wall-E will stop and turn its head toward where it detects the movement, and then turn its body in that direction.**

### Battery Indicator:

**By utilizing LED lights, this feature will enable us to know when the battery needs to be recharged or replaced.**



### LEDs Lights:

**The eyes will have two colors: blue and white. The blue color indicates that Wall-E is moving freely, while the white LEDs will turn on when an obstacle is detected by the ultrasonic sensor. This helps us understand if Wall-E is working properly.**

### Ultrasonic Sensor:

**The use of the ultrasonic sensor will allow Wall-E to have the ability to move freely while efficiently detecting obstacles in front of it. This sensor will allow Wall-E to accurately determine the distance to nearby objects. With this capability, Wall-E can navigate its surroundings with enhanced precision, avoiding collisions and ensuring safe traversal.**

We found the CAD file for the 3D Baby Wall-E parts online and made changes to the 3D printed parts to fit the ultrasonic sensor, IR sensors, LEDs lights, and battery check (which were not part of the original design). Additionally, we modified it to accommodate a larger battery size than what it was originally designed for.

We coded everything ourselves. The only two libraries we used for the code are Servo.h and NewPing.h

```
1    #include <Servo.h>
2    #include <NewPing.h>
```

The Servo.h library helps us control the servos for the arms and head of the robot, while we use NewPing.h for the ultrasonic sensor.

# Problems and Solutions

- Wheel Tracks: Initially, we had printed tracks for the robot, but the motor axles weren't long enough to hold them.
  - Various attempts to fix this, including using hot glue and epoxy, were unsuccessful due to the motors not being suitable for our robot's size. We switched to using robot wheels instead.
- Soldering: While soldering wires for the Arduino, some were accidentally broken and not initially visible.
  - After resoldering, we discovered two wires for the H-bridge were burned and not connected to the Arduino.
- Battery: We faced issues with battery couldn't power all components.
  - We added an extra one to power all the servos.

# Demo