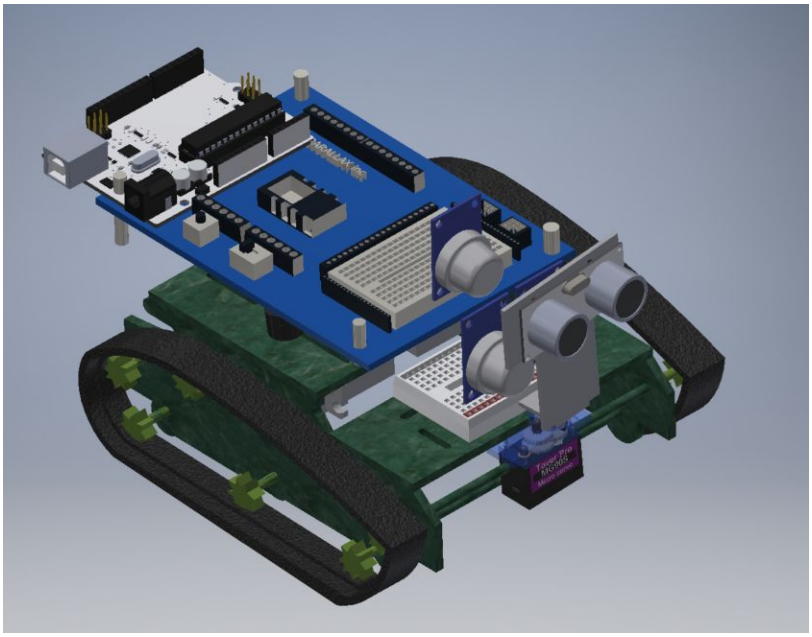


GAS DETECTION ROBOT and BOX MOTOR ASSEMBLY

Instructions and Assembly Details

Ayush Singh Team Member: Mahik S.

VERSION 1.1.0

Mechanical Parts

Item Number	Item Name	Item Description	Qty
1	Tracks	2 inch	2 Sets of 35 pieces
2	Axle	Metal rod. 1/16”	6
3	Frame	Aluminum Composite: - Metal frame 3” x 3 1/4” - Metal Frame 3 ¼” x 1” - Side frame	1 each 2 for side frame
4	High Strength 6 tooth sprocket.	1” spokets - 6 tooth sprocket	12

Components

Item Number	Item Name	Item Description	Qty
1	Micro Servo Clamps	Clamps to Ultrasonic Sensor	1
2	Hexagon Socket Button Head Cap Screw	Inch 8 - 32 x 1/4	18
3	Drywall screws	1 inch. ⅛ width	6
4	Parallax Screws	Tread 2-56	10
5	Foam Board	Placed on metal to stop conductivity.	1

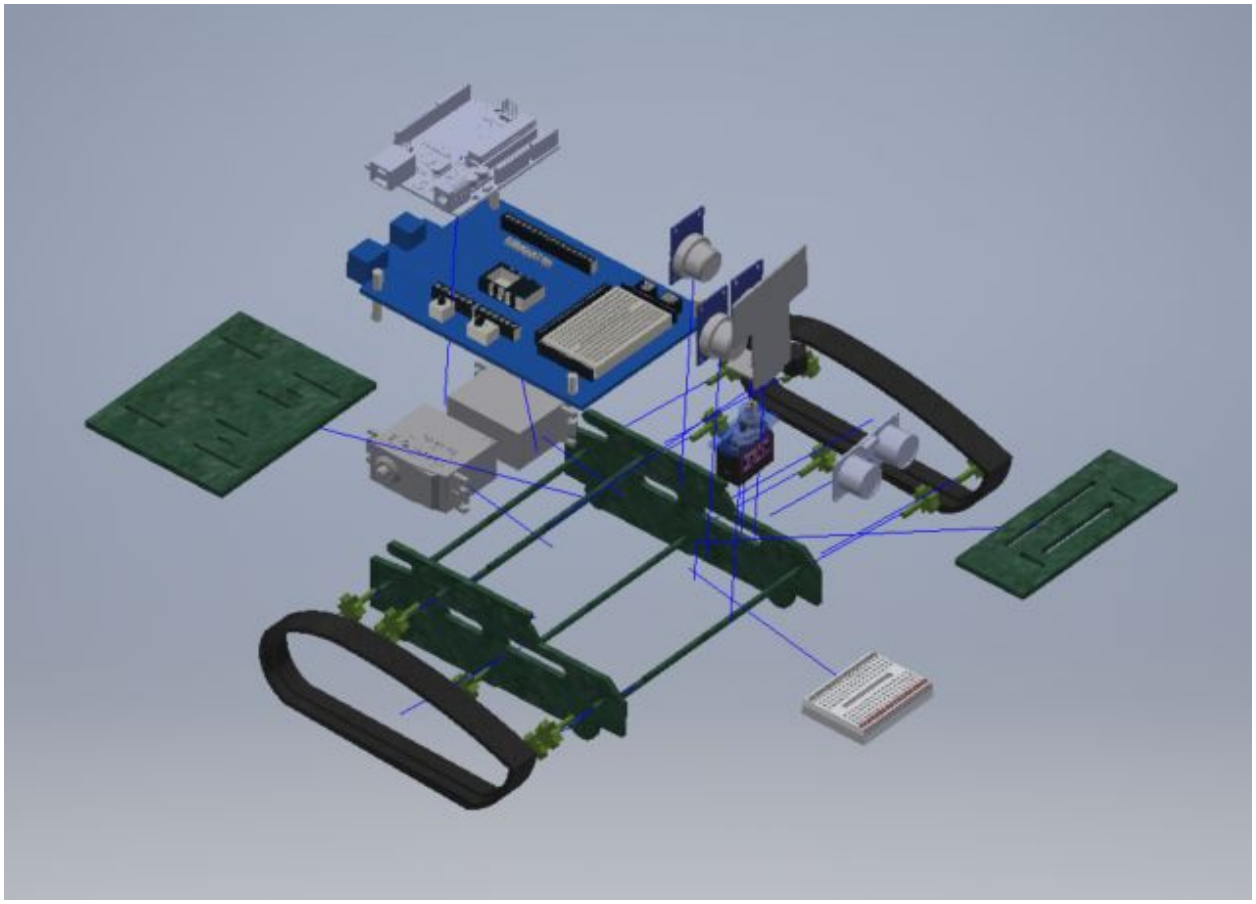
Electronic Components

Item Number	Item Name	Item Description	Qty
1	Servo	Parallax Continuous Rotation	4
2	Arduino	Arduino Uno	2
3	Shield	Parallax BOE shield	1
4	Wires	1. Male to Male 2. Male to female 3. Female to female	-----
5	Power Supply	AA Battery Pack Power supply cable	1
6	LED	LED Strip - Blue - White - Green	1
7	Gas Sensors	MQ-135 MQ-5 MQ-8	3
8	Resistors	100 - 300 Ohm	4
9	Ultrasonic Proximity Sensor	HC-SR04P	1
10	Micro Servo	Micro Servo	1
11	Piezo	Stable Piezo	1
12	Breadboard	Mini	3
13	Push Button	Mini and large	6
14	Bluetooth Module	HC-06	1

Tools

Item Number	Item Name	Item Description	Qty
1	Screw Driver	BOE shield Driver	1
2	Screws	½” Screws	2
3	Soldering Kit	----------	1
4	Electrical Tape		1 roll
5	3/32” Allen Key	3/32” Allen Key	1
6	5/64” Allen Key	5/64” Allen Key	1

Overall ROBOT Assembly Parts



https://youtu.be/fkgx9TAoZhk

Arduino BOE Assembly

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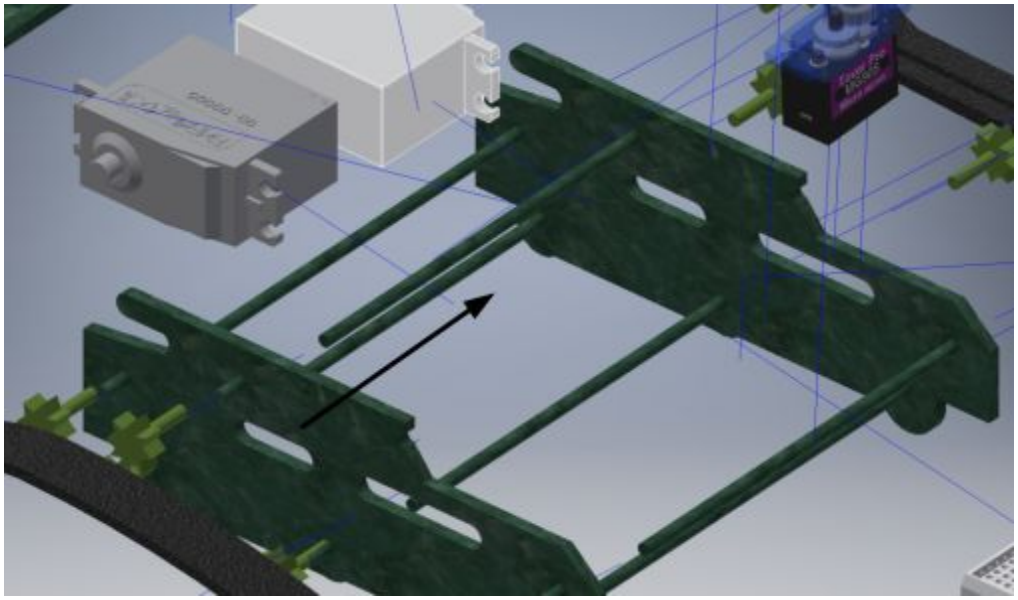
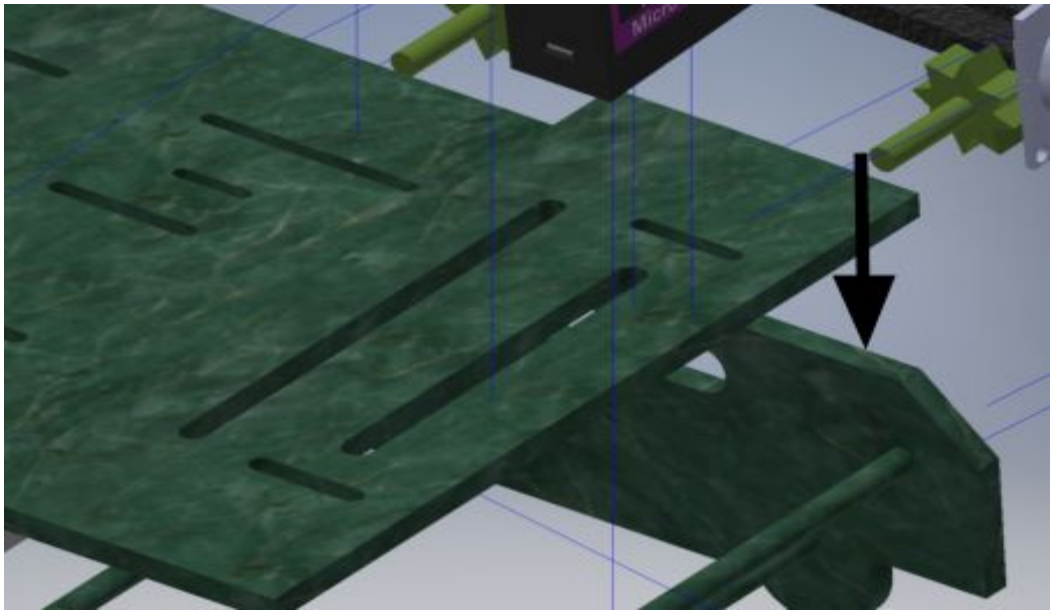
2. 

3. 

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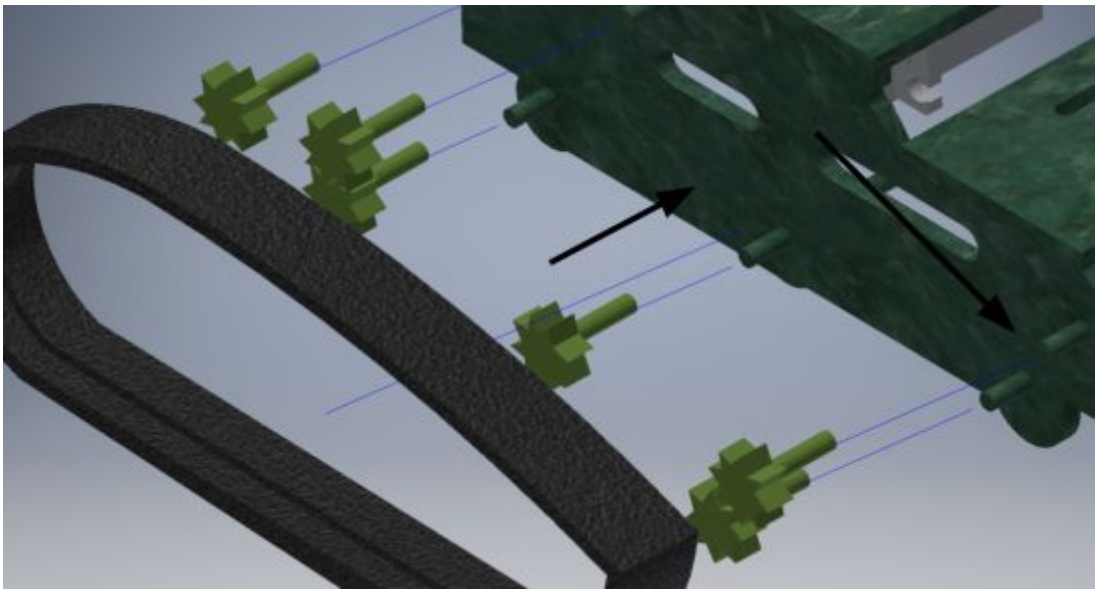
5. 

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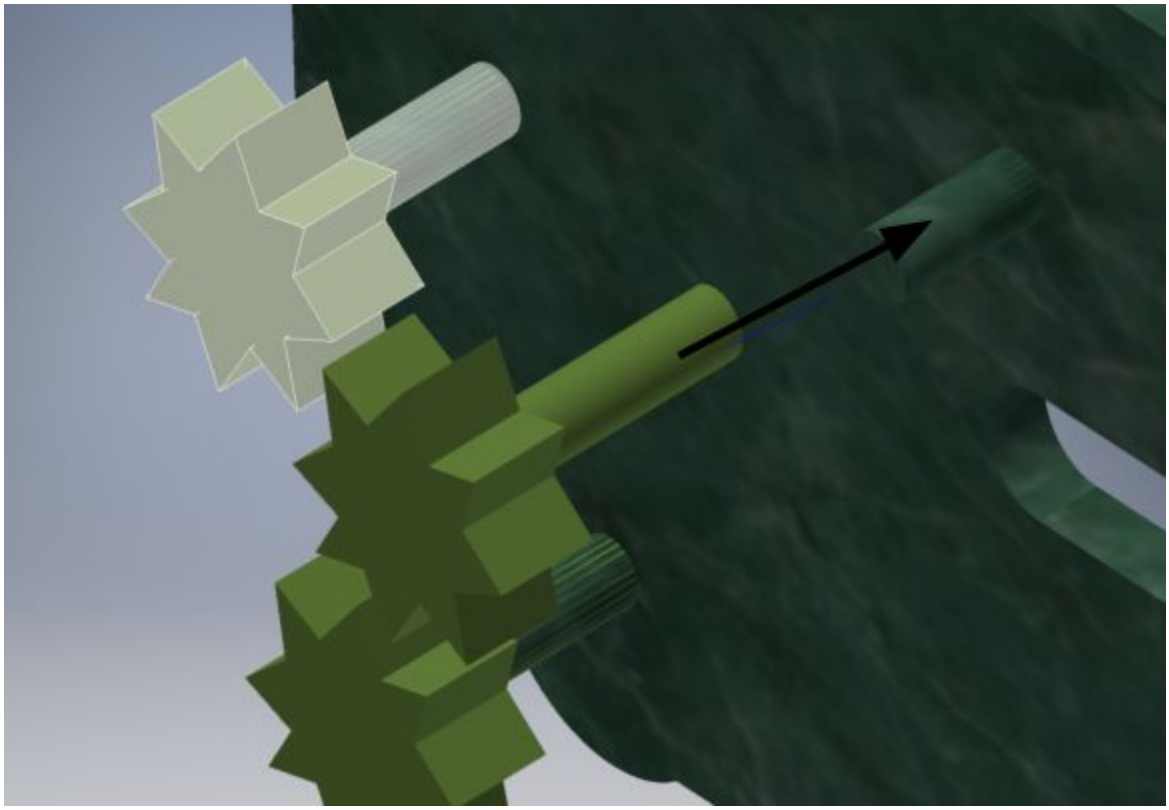

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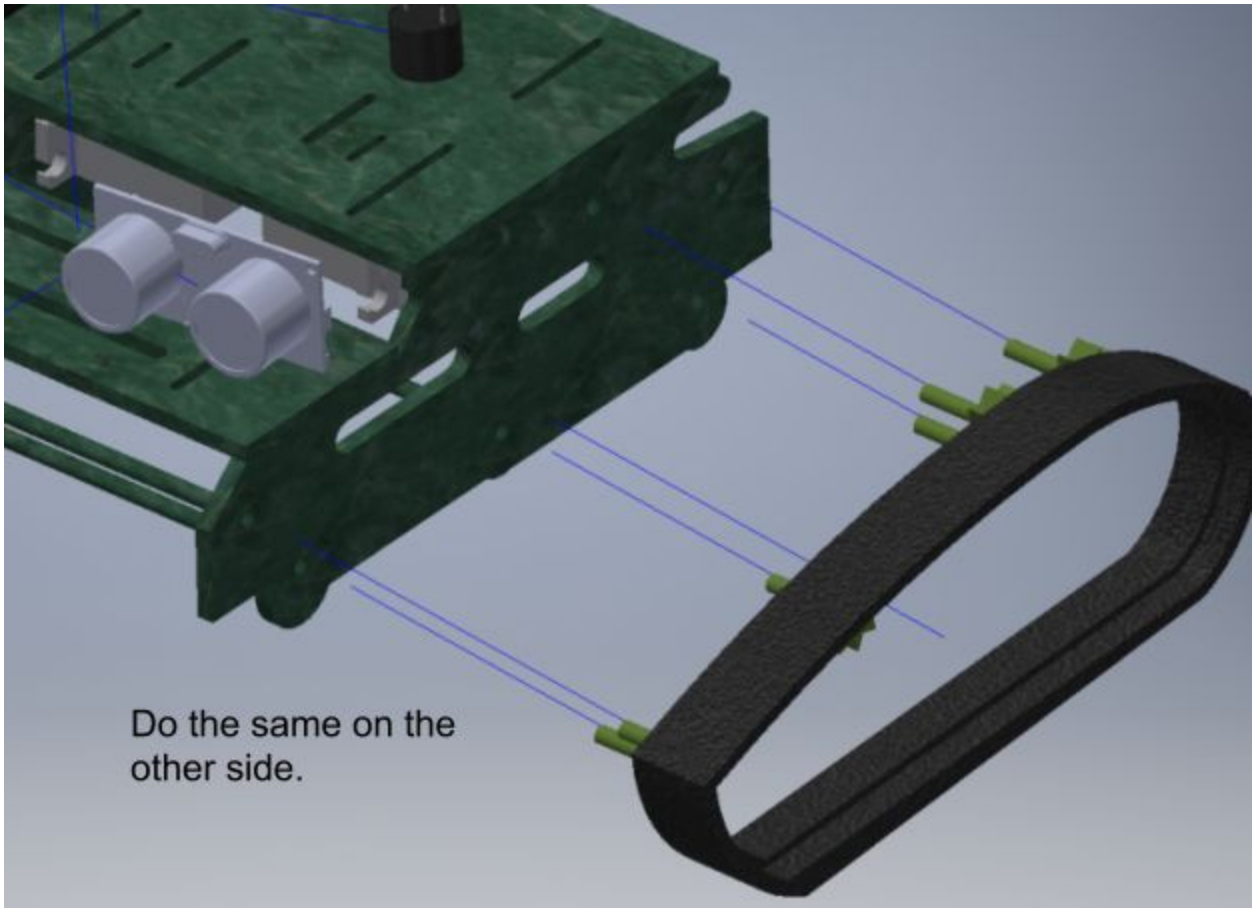

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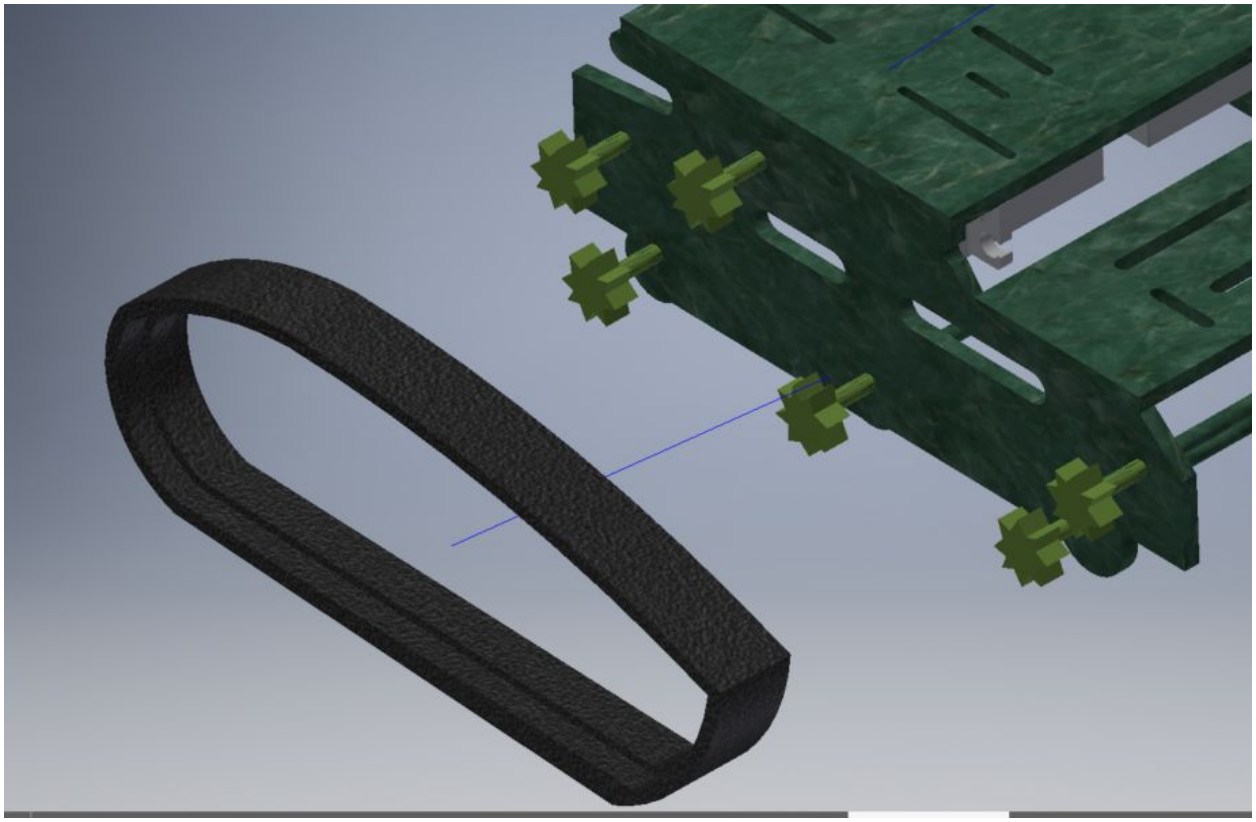

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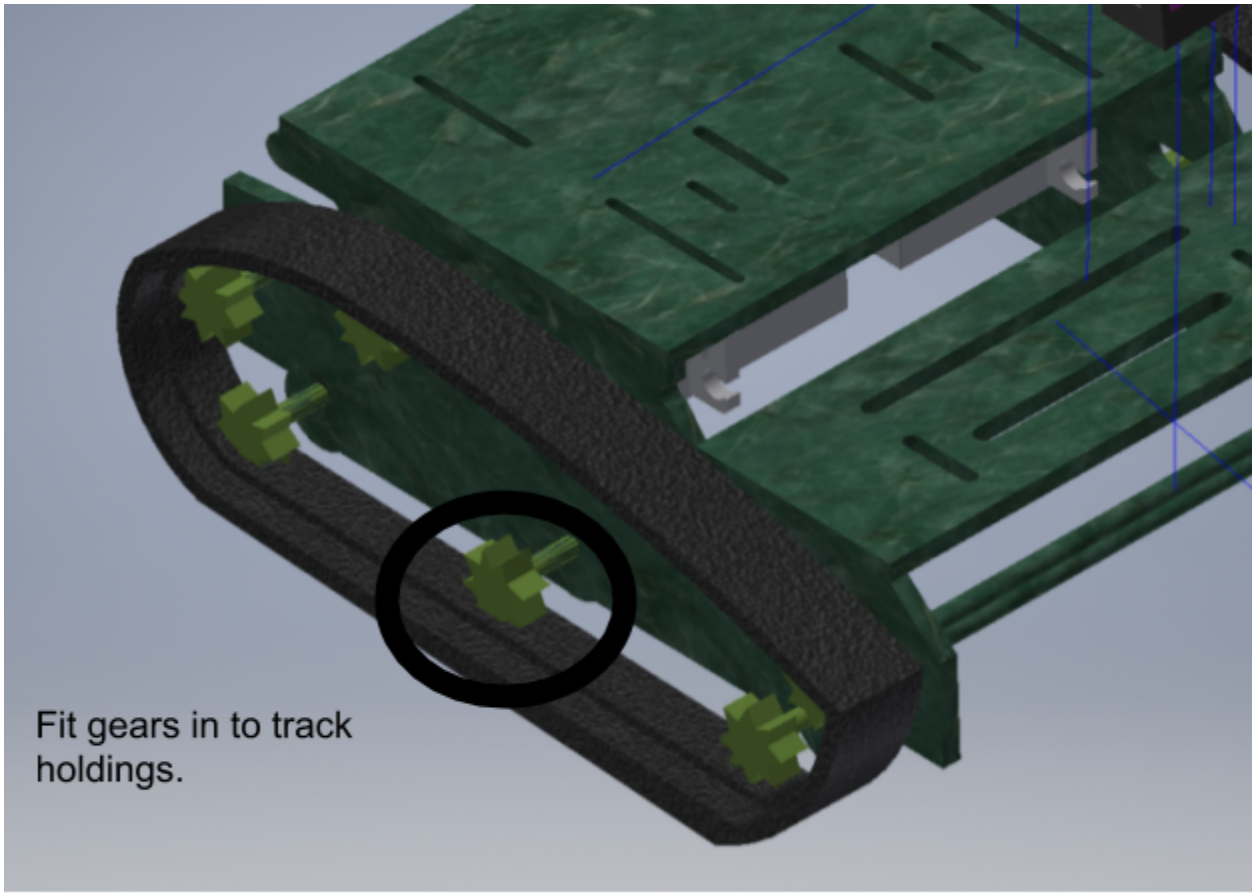
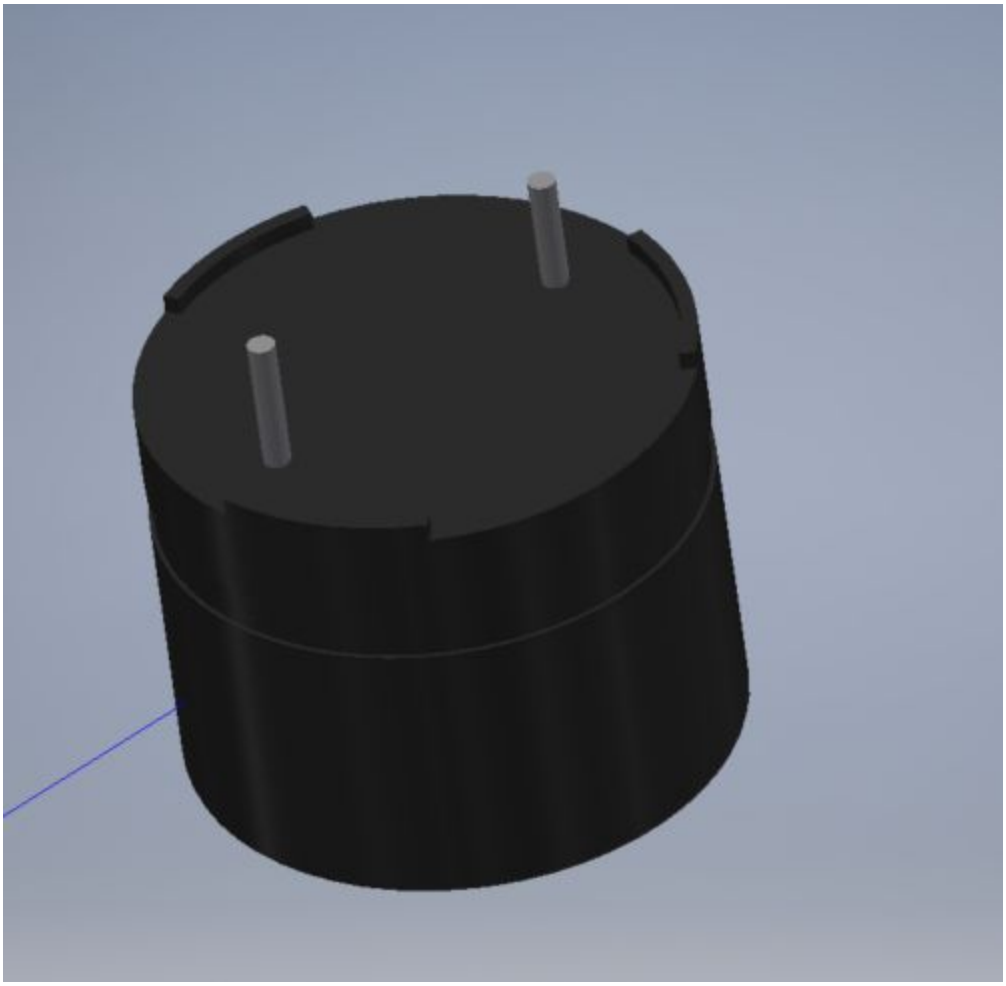
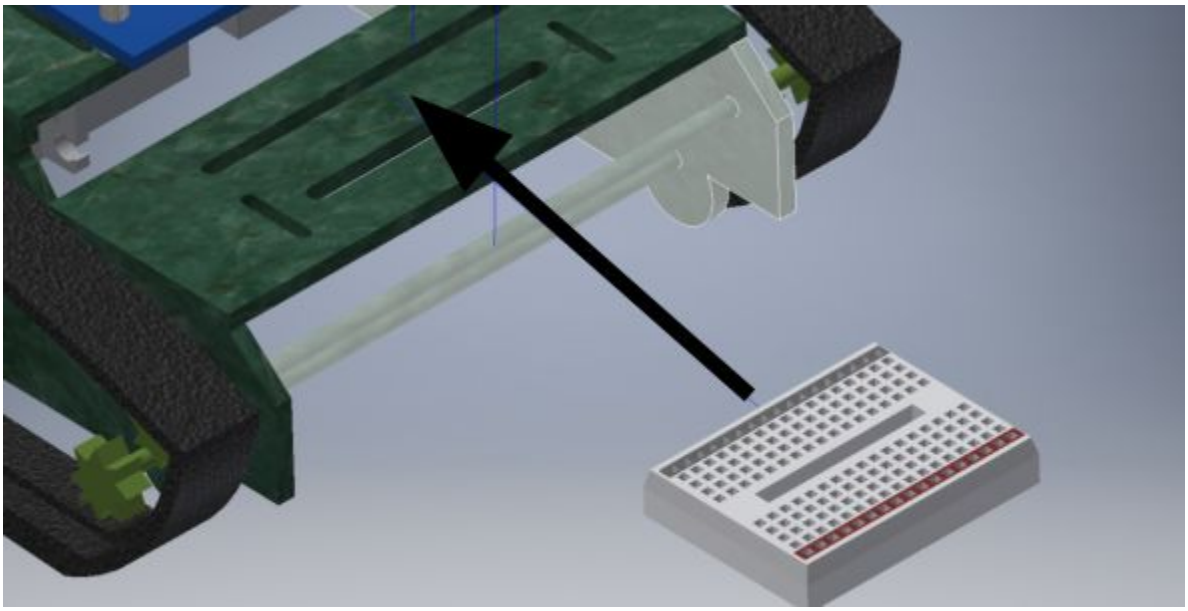
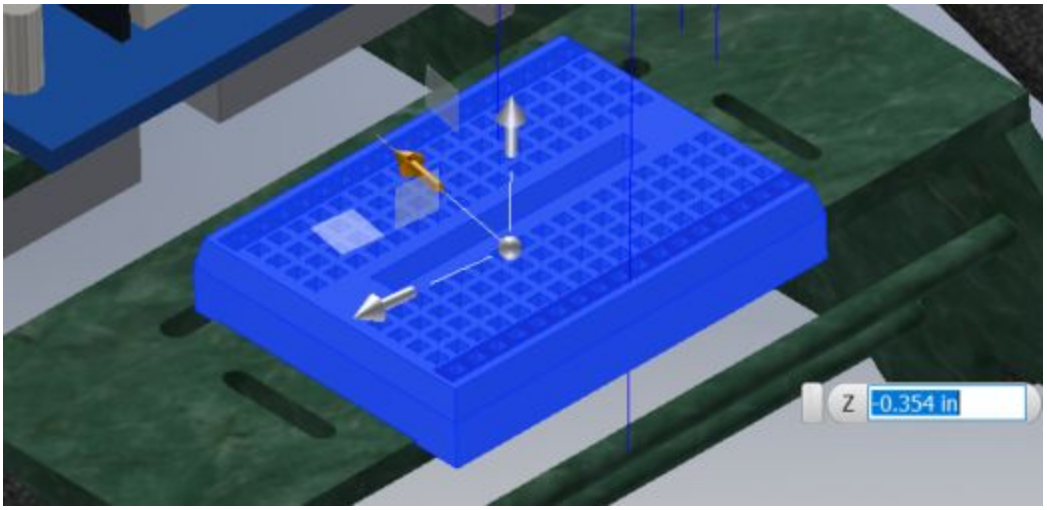
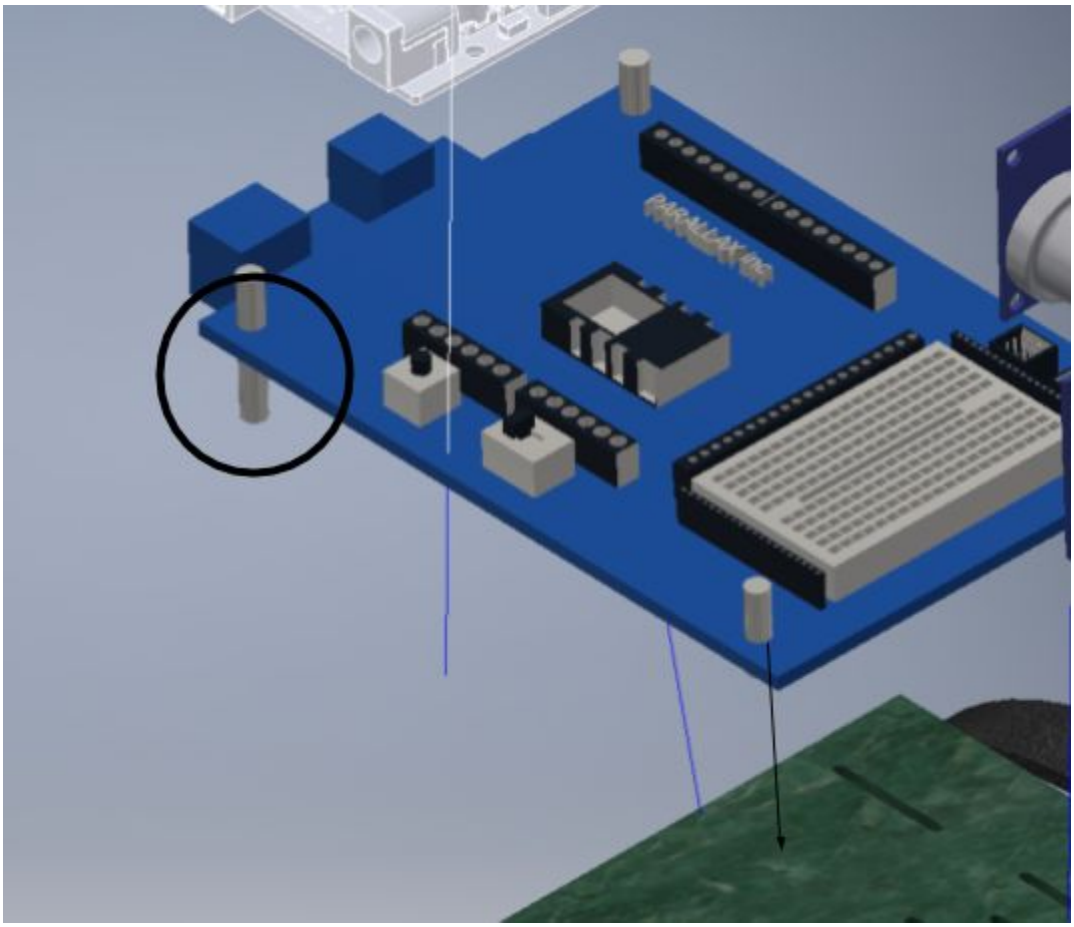


10. 

Attach Piezo into the BOE shield as shown in the wiring diagram.

11. 

12. 

13. 

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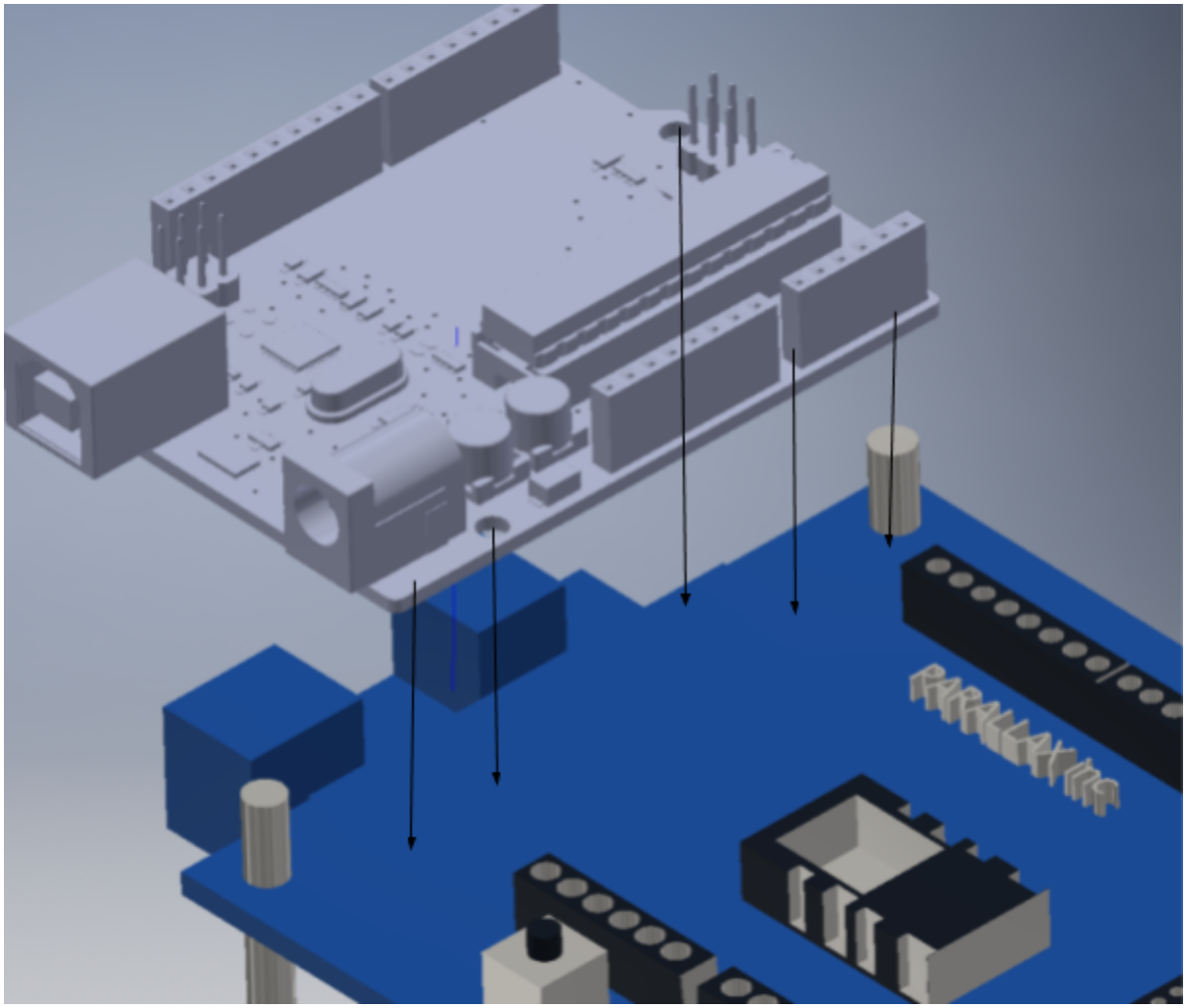
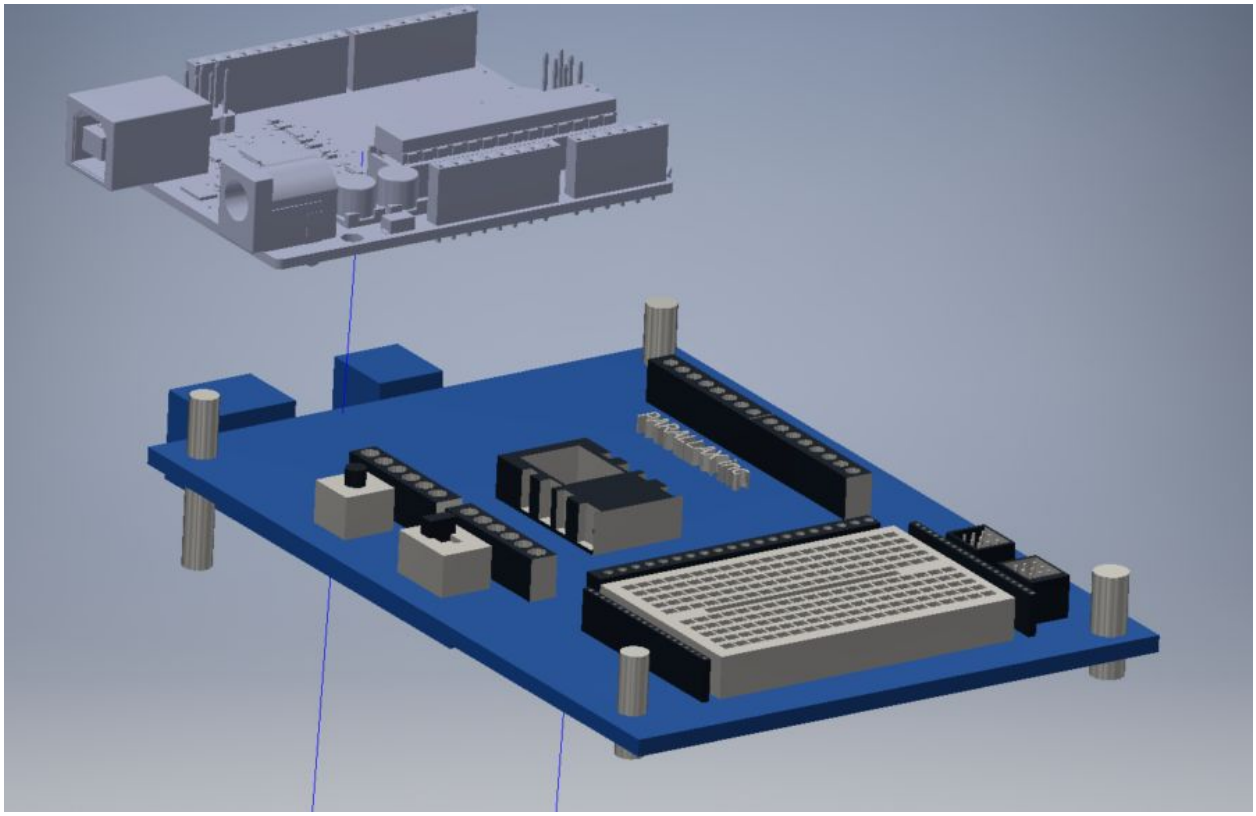
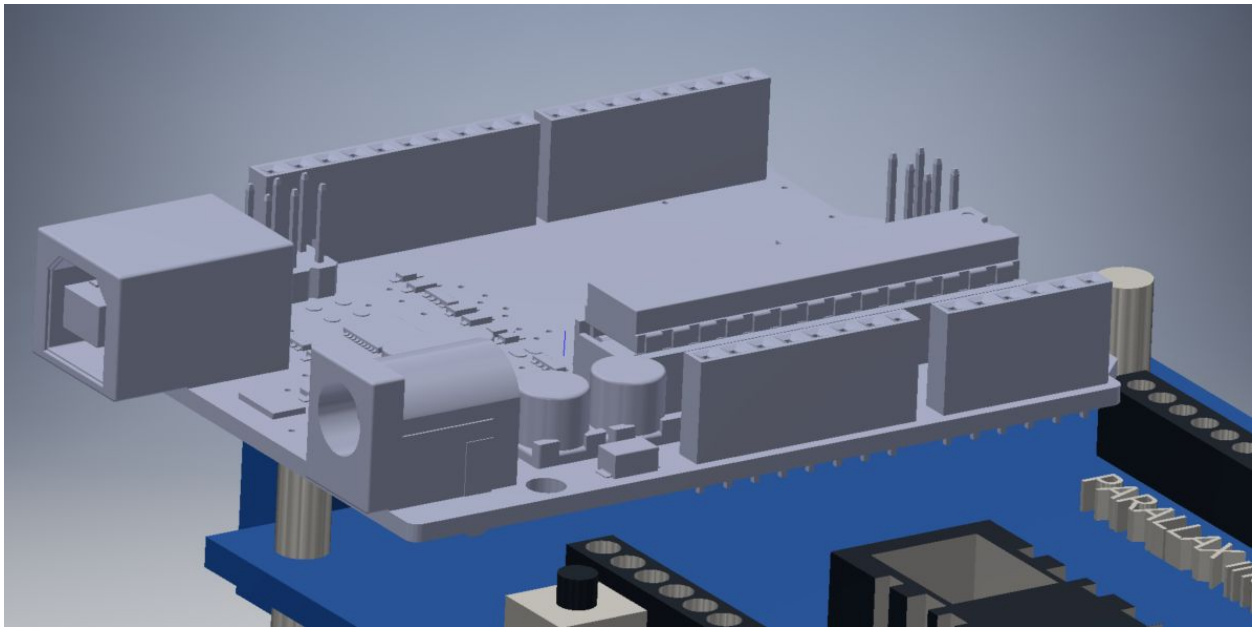
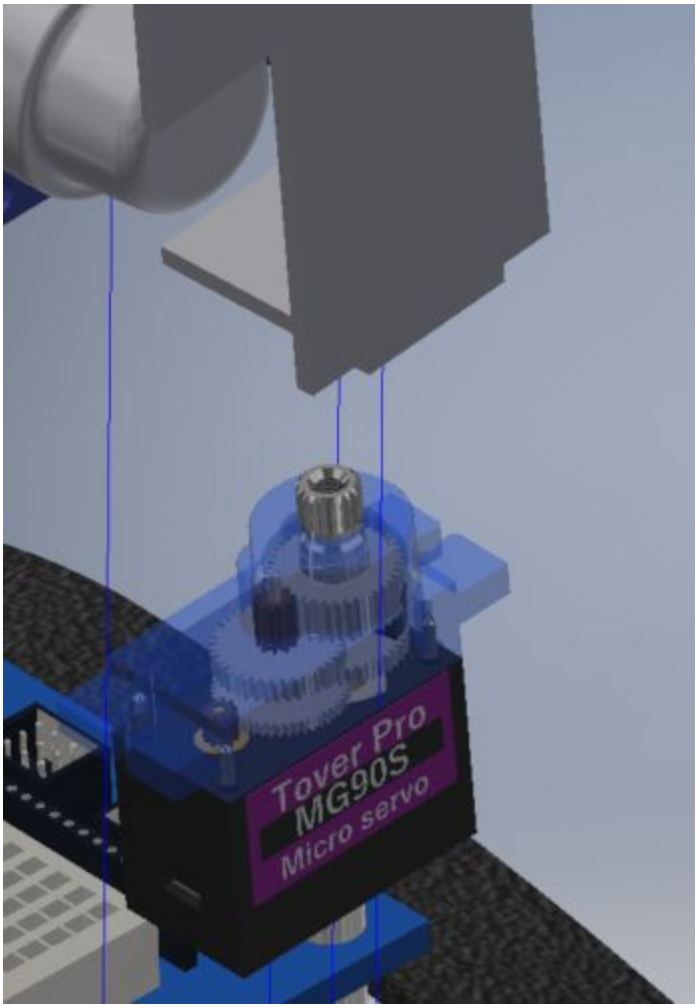
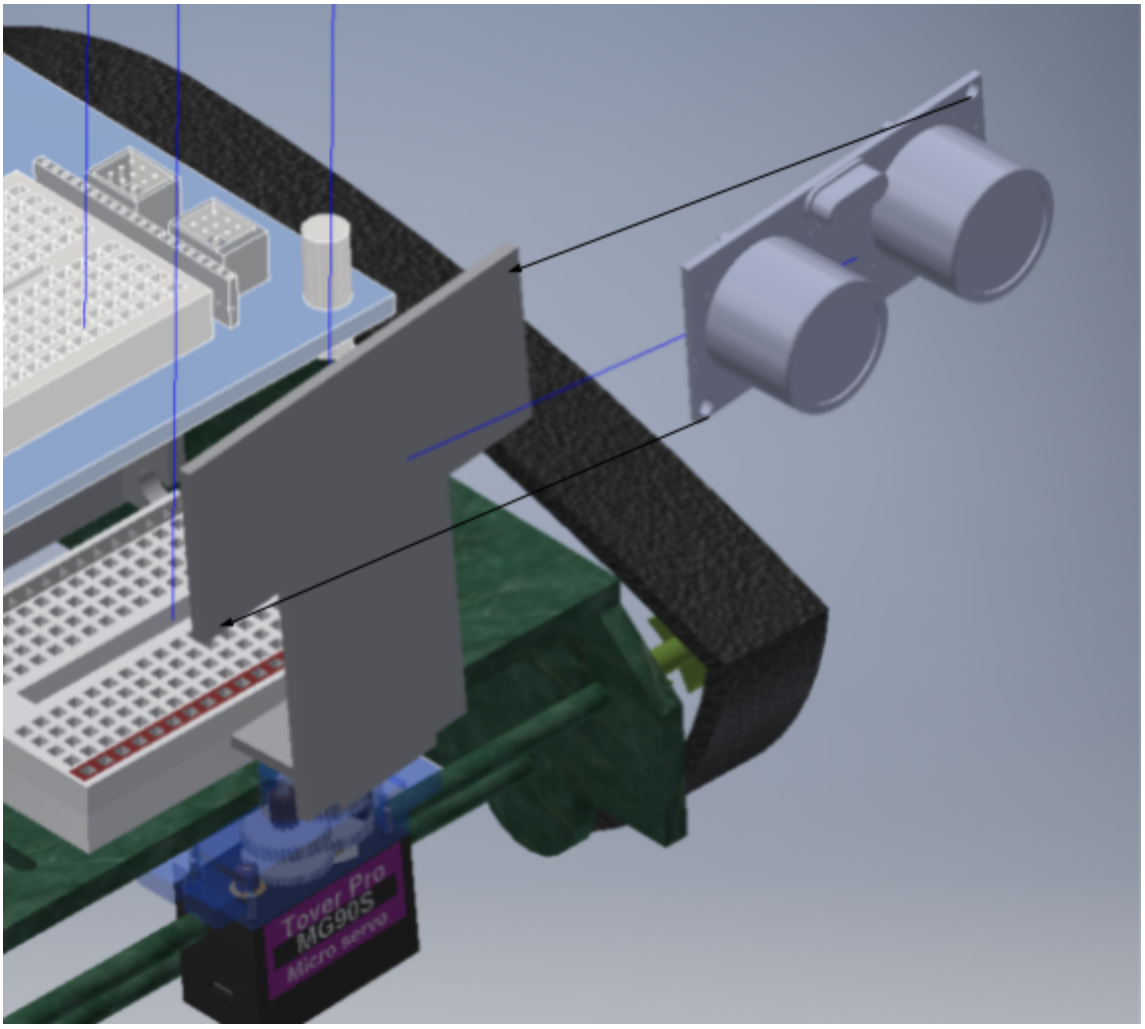
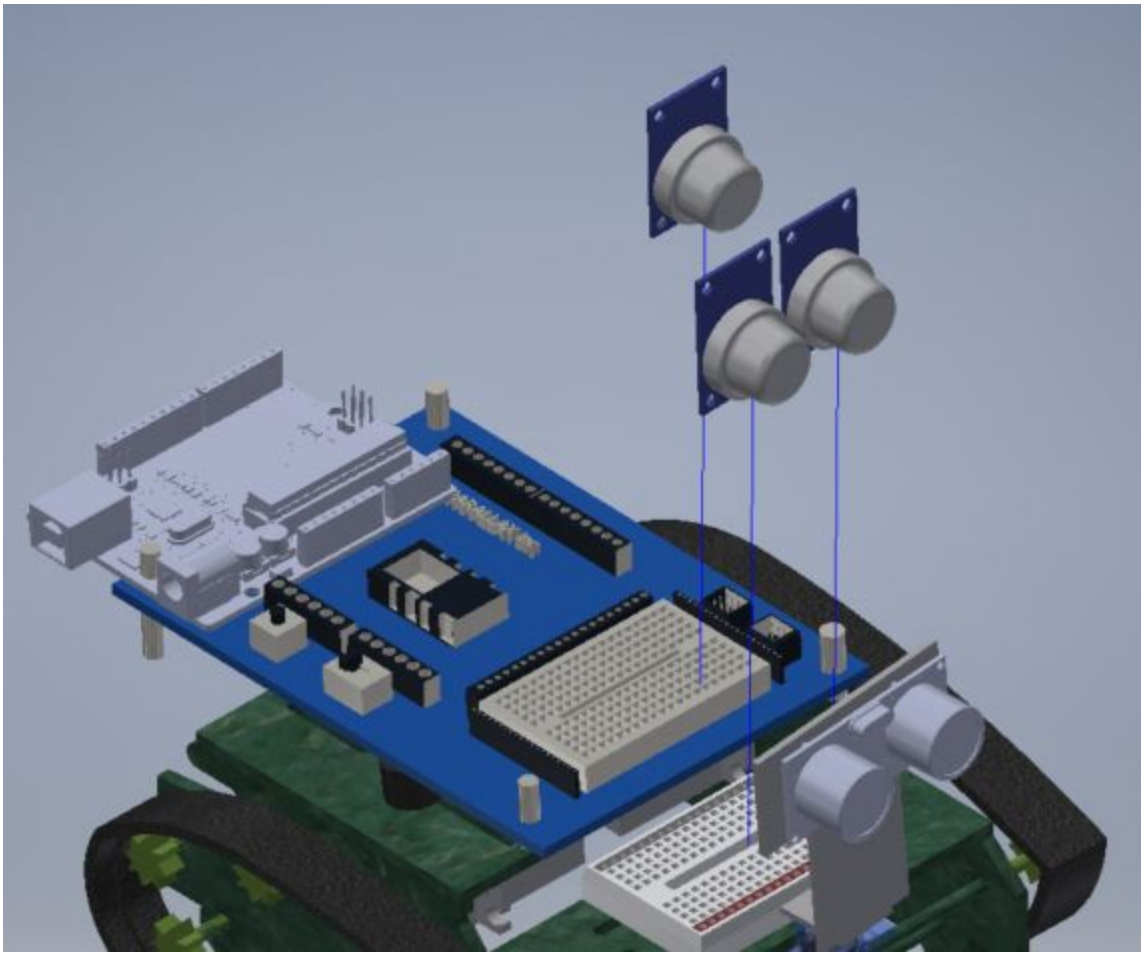



PARALLAX INC.


PARALLAX

15. 

16. 

17. 

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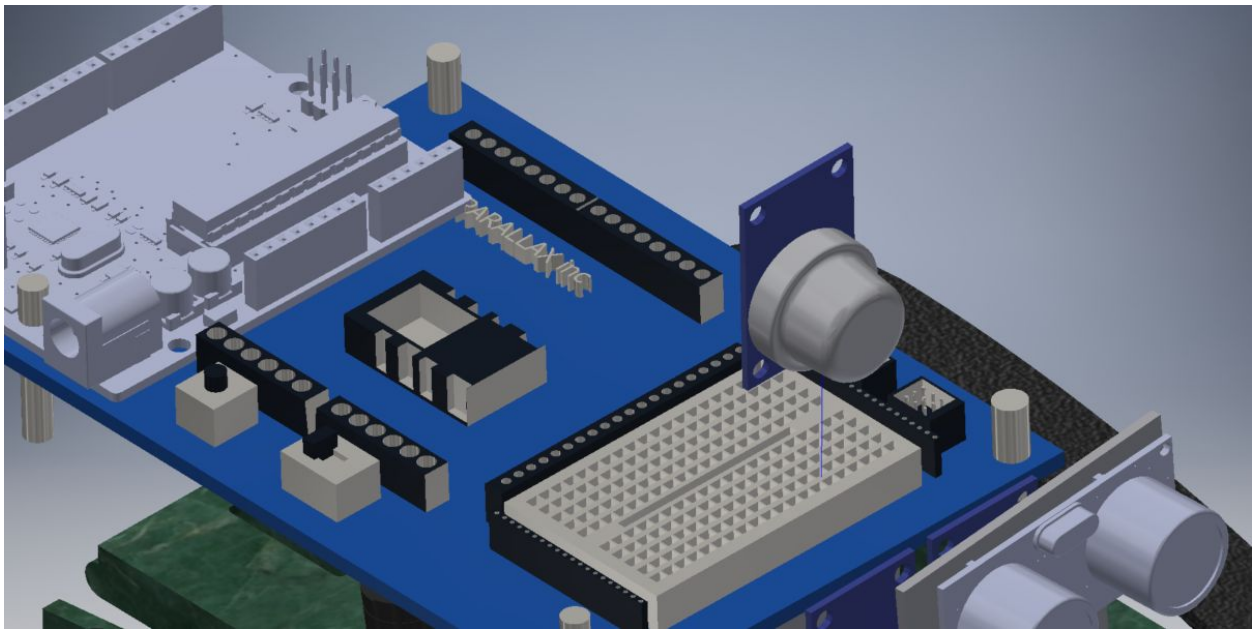

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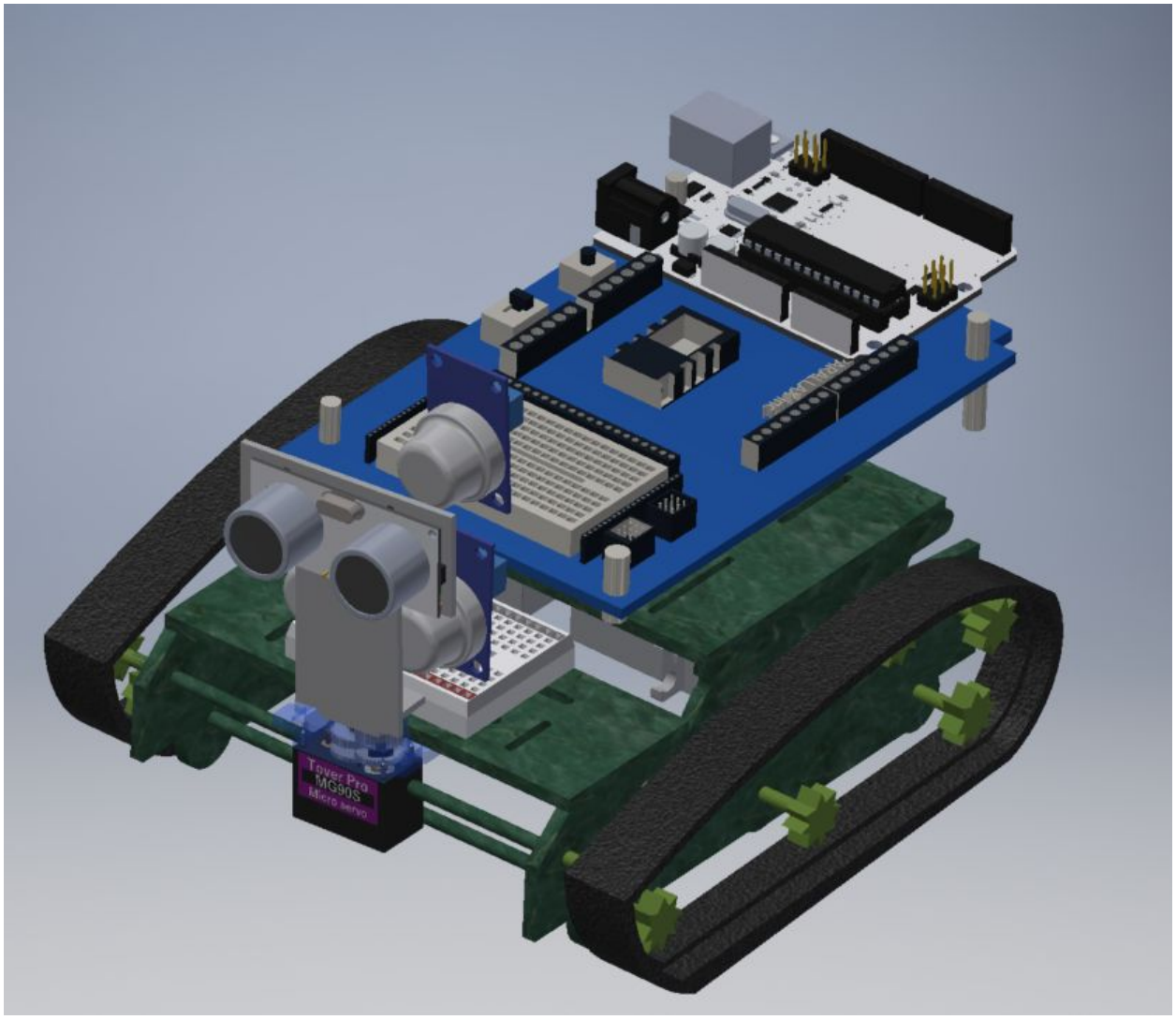
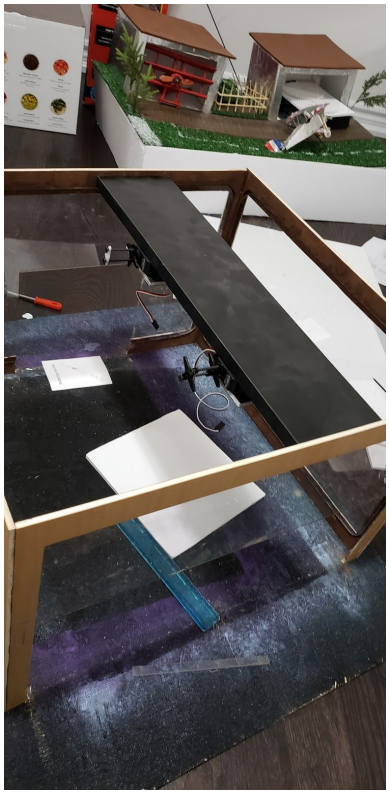
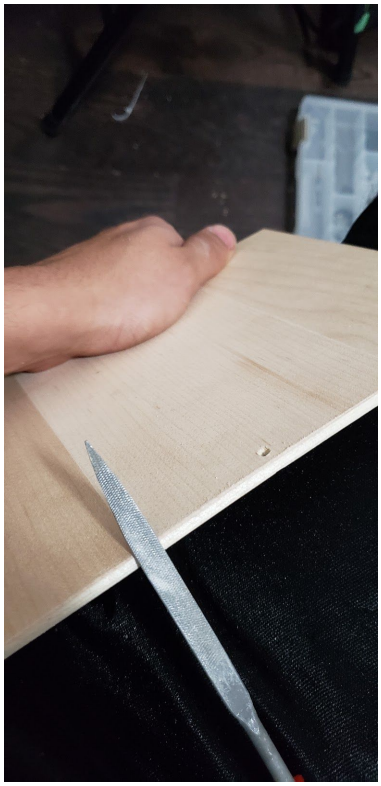
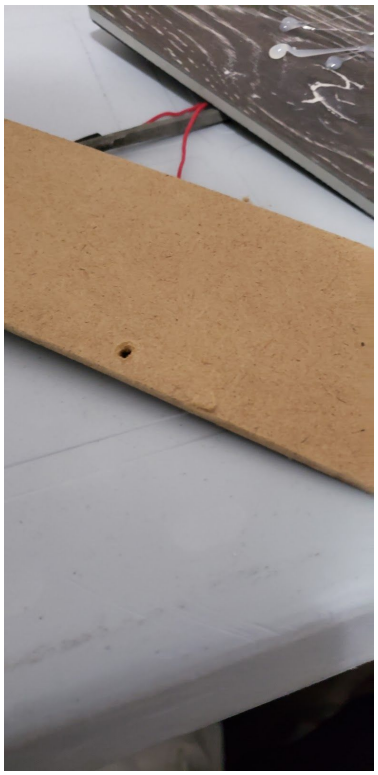
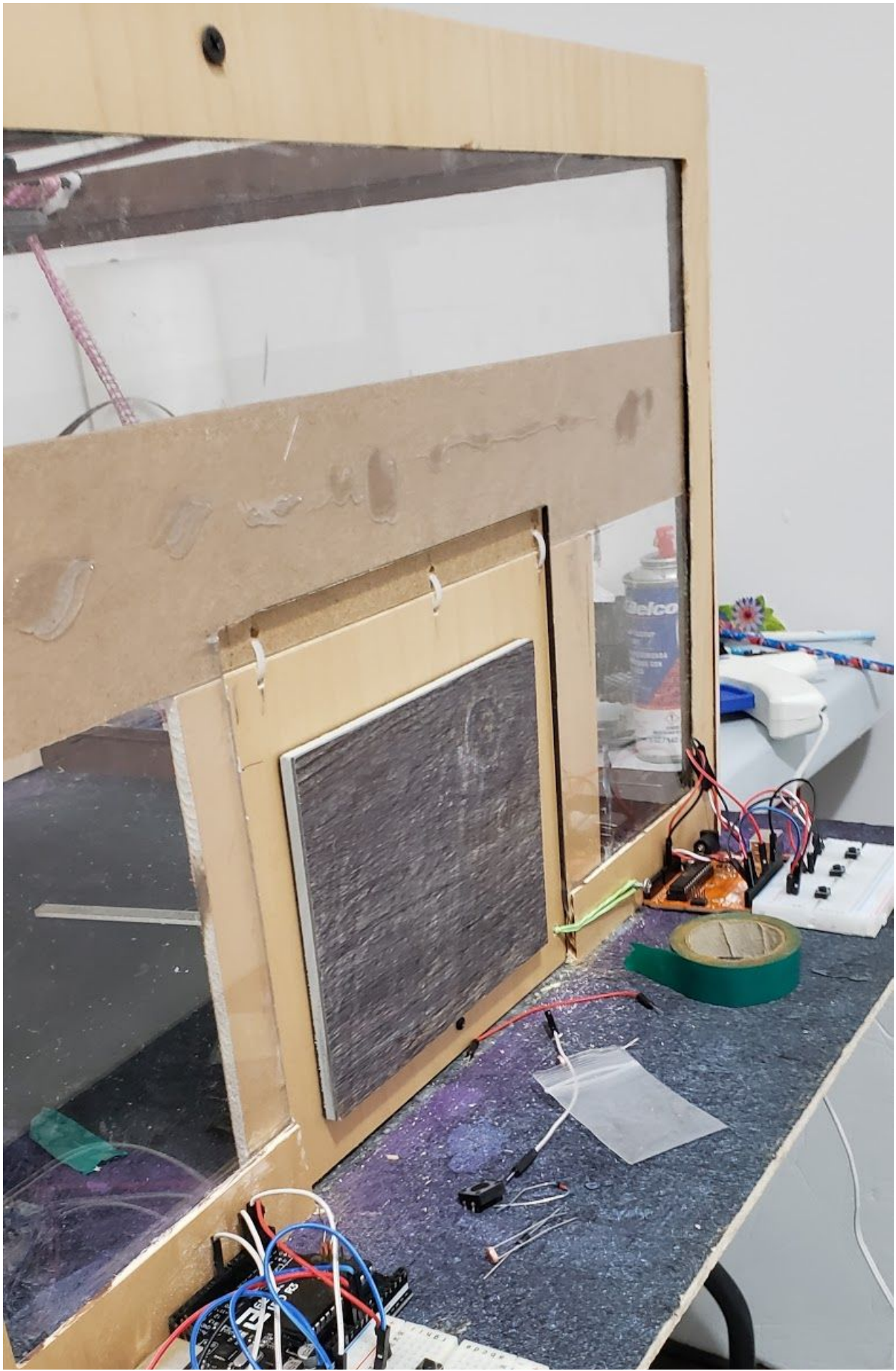
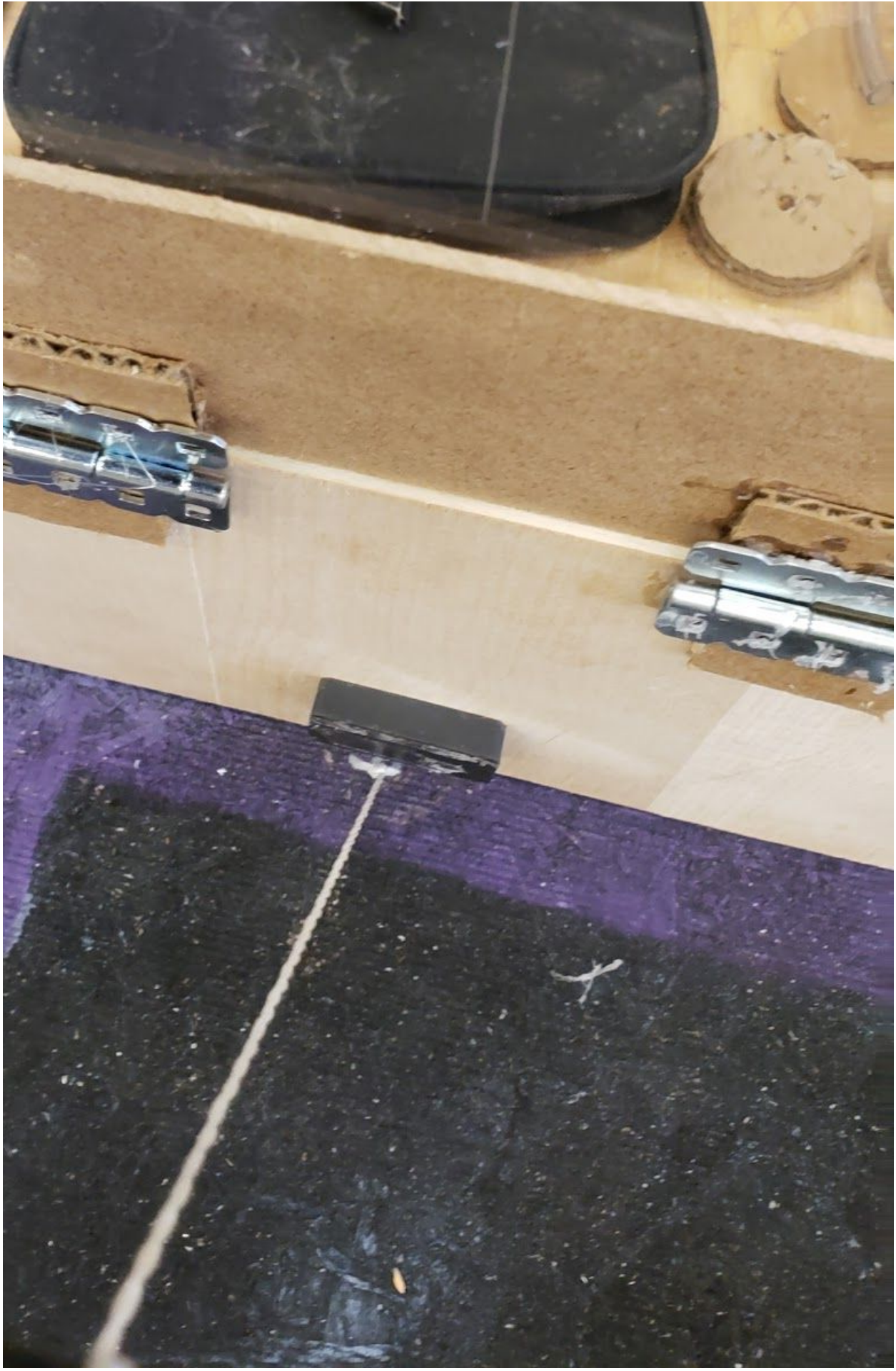


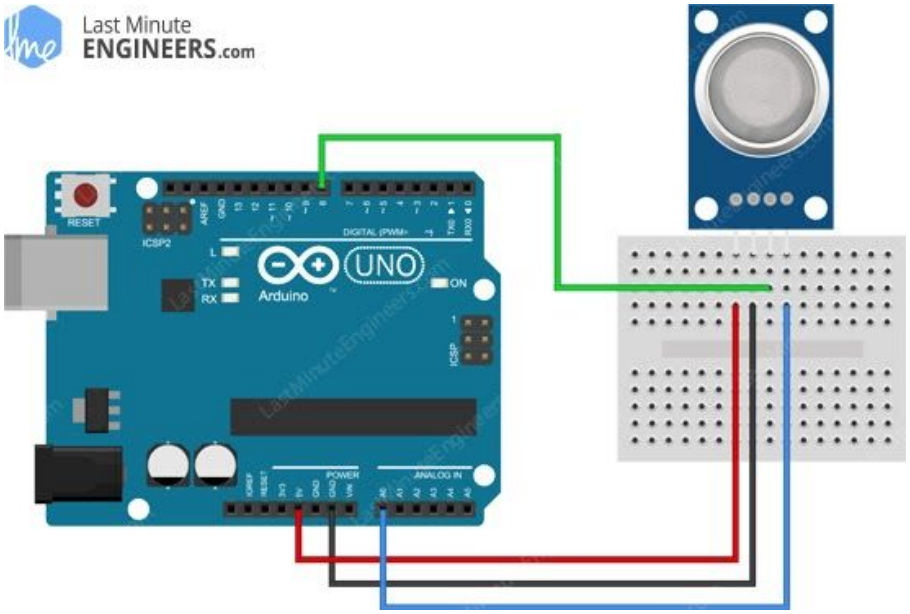
Box Motor Assembly

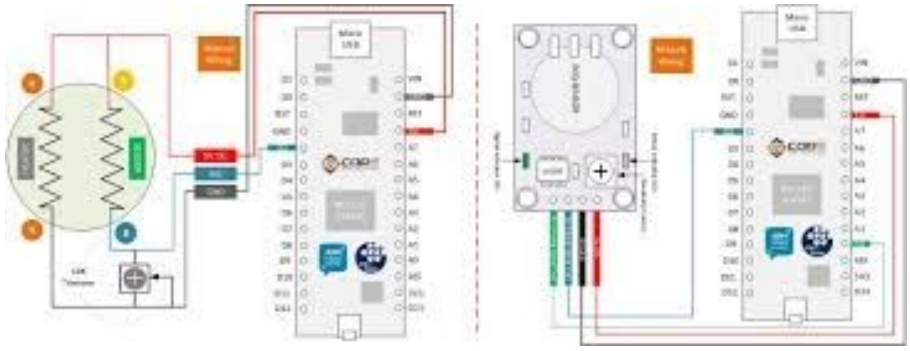




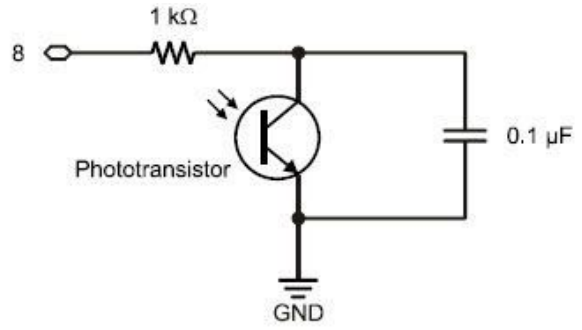


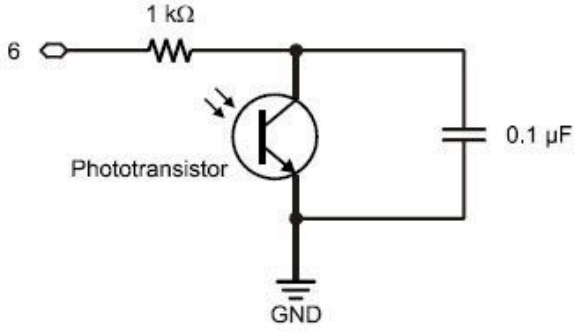


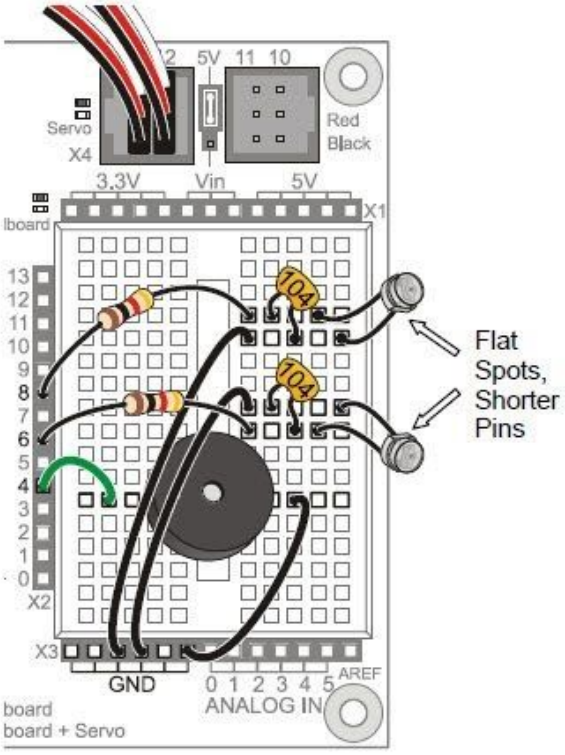
Wiring Description

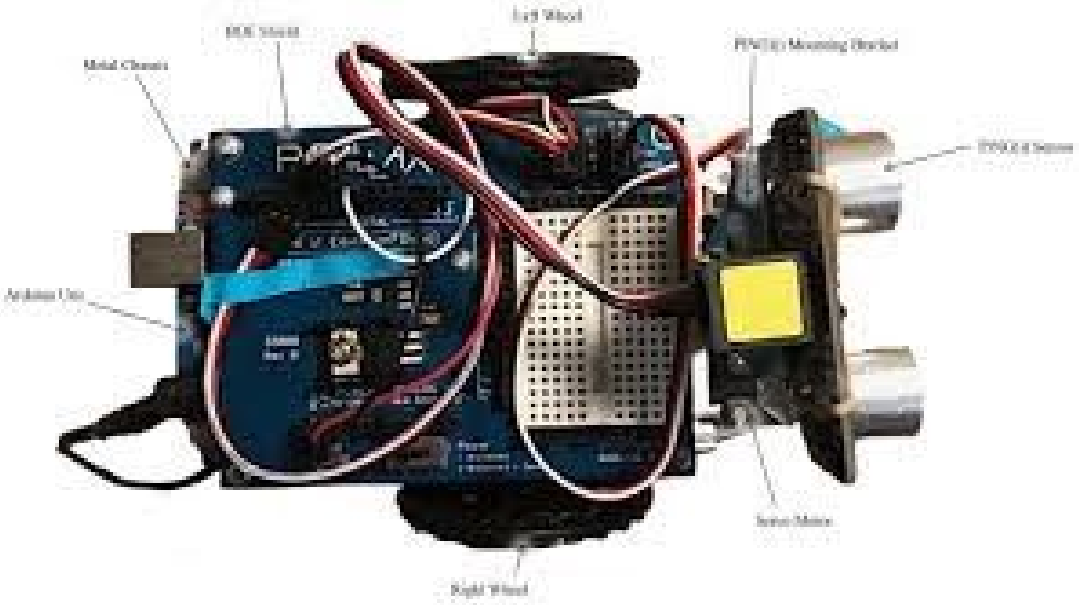





1 kΩ
8
Phototransistor
0.1 µF
GND


1 kΩ
6
Phototransistor
0.1 µF
GND


2 5V 11 10
Servo
X4
Red
Black
3.3V
Vin
5V
X1
board
13
12
11
10
9
8
7
6
5
4
3
2
1
0
X2
X3
GND
0 1 2 3 4 5
ANALOG IN
AREF
board
board + Servo
104
104
Flat
Spots,
Shorter
Pins



How to use a 4-pin ultrasonic sensor as a 3-pin ping sensor?

Asked 2 years, 10 months ago Active 1 year, 10 months ago Viewed 636 times

1

```
const int pingPin = A0;

void loop() {
  long duration, inches, cm;
  pinMode(pingpin, OUTPUT);
  digitalWrite(pingPin, LOW);
  delayMicroseconds(2);
  digitalWrite(pingPin, HIGH);
  delayMicroseconds(5);
  digitalWrite(pingPin, LOW);
  pinMode(pingPin, INPUT);
  duration = pulseIn(pingPin, HIGH);
  inches = microsecondsToInches(duration);
  cm = microsecondsToCentimeters(duration);
  Serial.print(inches);
  Serial.print("in, ");
  Serial.print(cm);
  Serial.print("cm");
  Serial.println();
}
```

Sensor Description

Name:	Description
MQ-135	Sensitive for Smoke and CO2. This sensor is sensitive for flammable and combustible gasses. The heater uses 5V.
MQ-5	Sensitive for Natural gas, LPG The heater uses 5V.
MQ-8	Sensitive for Hydrogen Gas The heater uses 5V.
Ultrasonic Sensor	The HC-SR04 ultrasonic sensor uses SONAR to determine the distance of an object just like the bats do. It offers excellent non-contact range detection with high accuracy and stable readings (https://www.tutorialspoint.com/arduino/arduino_ultrasonic_sensor.htm)

-From Arduino.com