Classification Color System (CCS)

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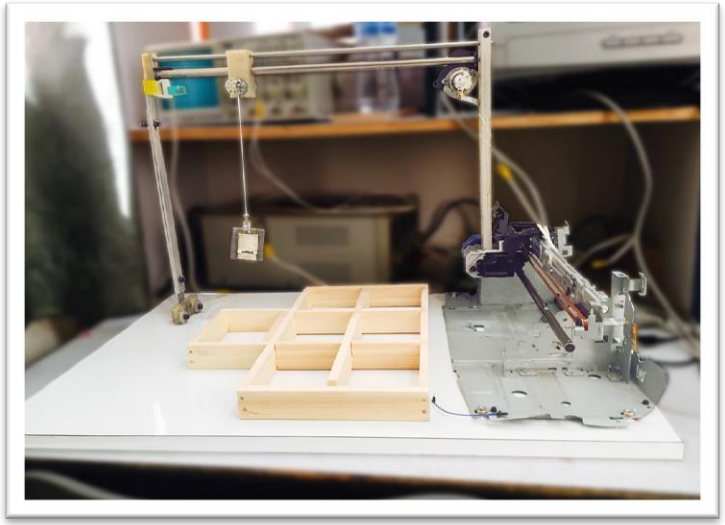
Outlines

- Introduction.
- Hardware Components.
- Design.
- Implementation.
- Problems.
- Demo.
- Future Works.

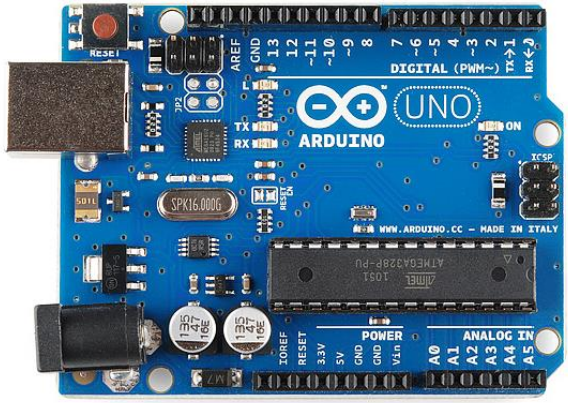
Introduction

CCS is a robotic system that classify objects according to their colors.



Hardware Components

1. Arduino
2. DC Motors
3. H-Bridges [L293D]
4. Color Sensor
5. ULN2003



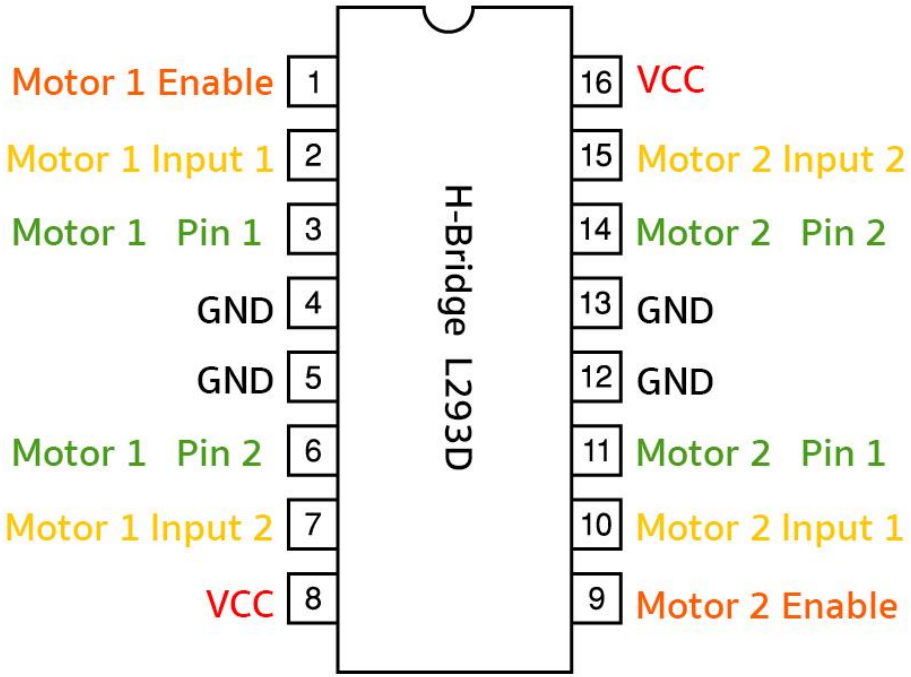
Hardware Components

Arduino

- An Open Source Platform.
- Very Flexible.
- Consists of both Hardware and Software.
- Uses C++.

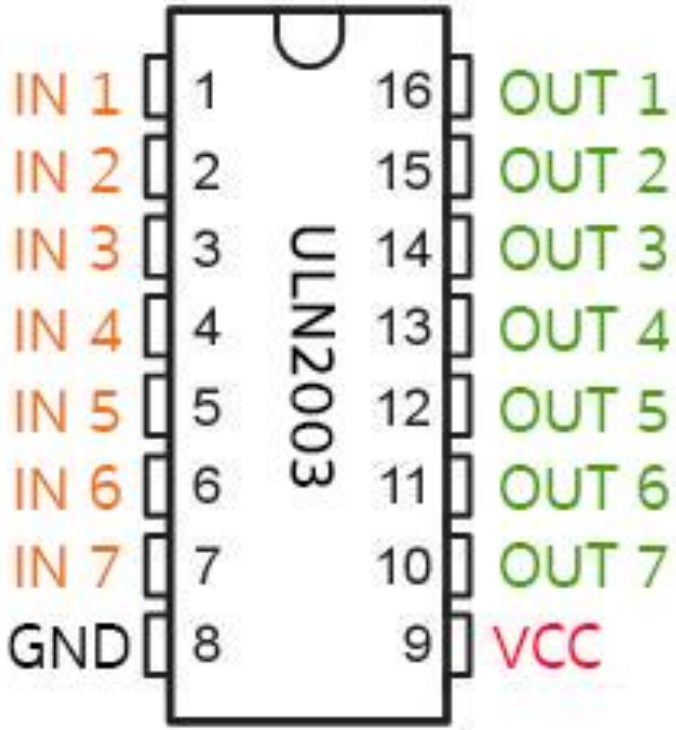
Hardware Components

- **H-Bridge [L293D]**



Hardware Components

- **ULN2003**

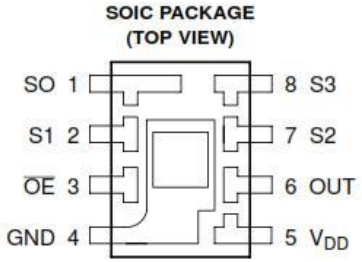


Hardware Components

➢ Color Sensor (TCS230)

Light-to-frequency converter.

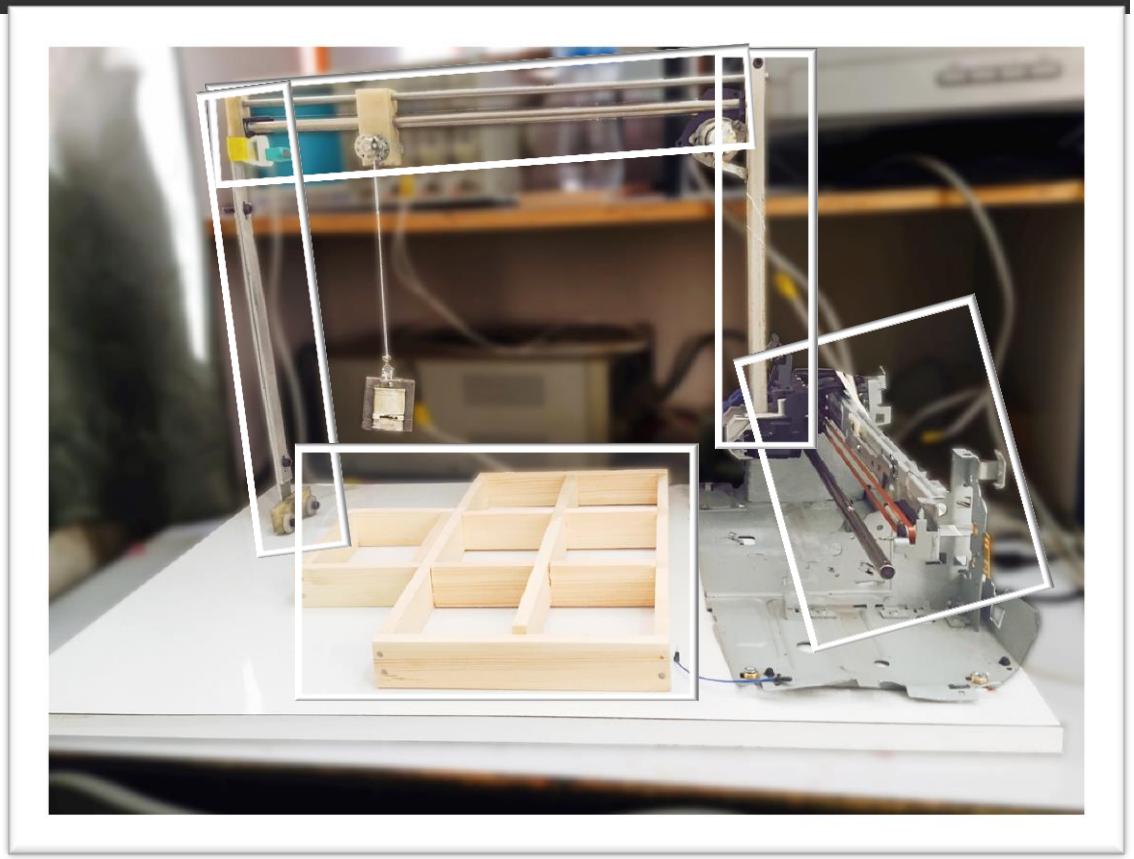
How does this Sensor work?



S2	S3	Color
LOW	LOW	Red
LOW	HIGH	Blue
HIGH	HIGH	Green

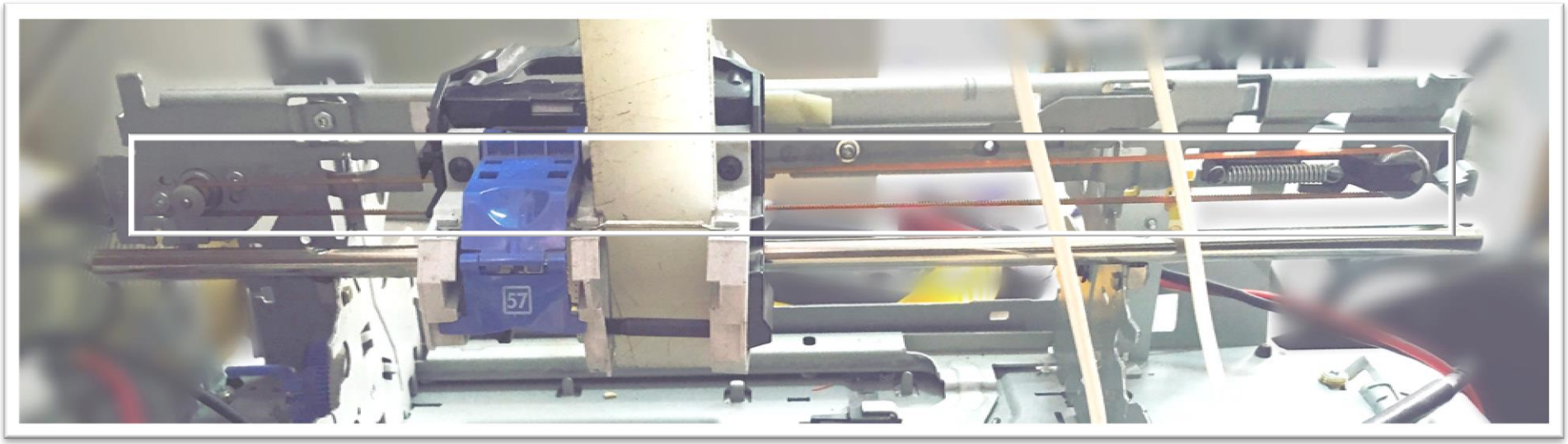
Design

- The Base.
- Vertical Arm.
- Horizontal Arm.
- Supporting Leg.
- The Boxes.



Design

1. The Base



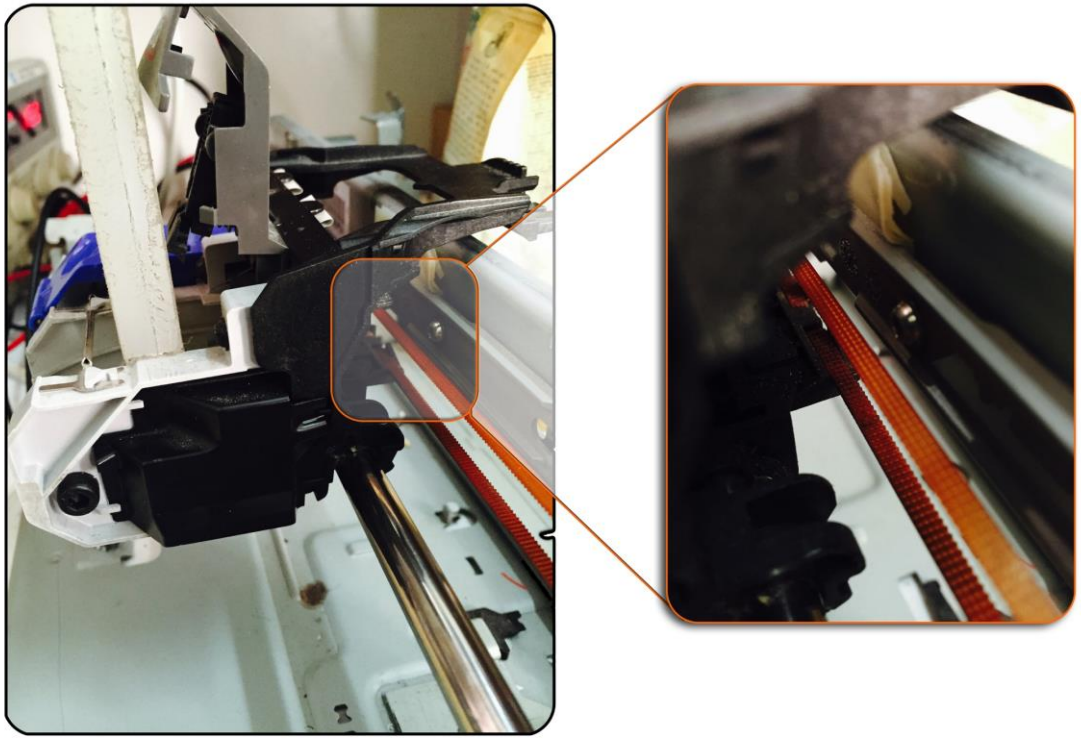
Design

1. The Base

Dc Motor with the pulley and belt.

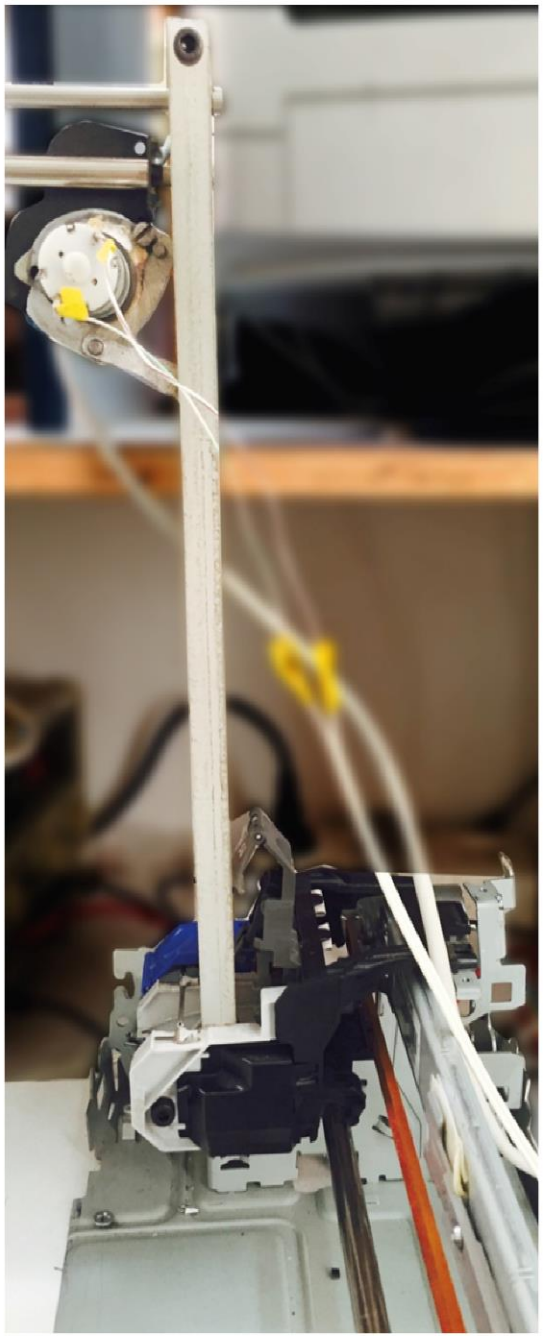
Design

1. The Base



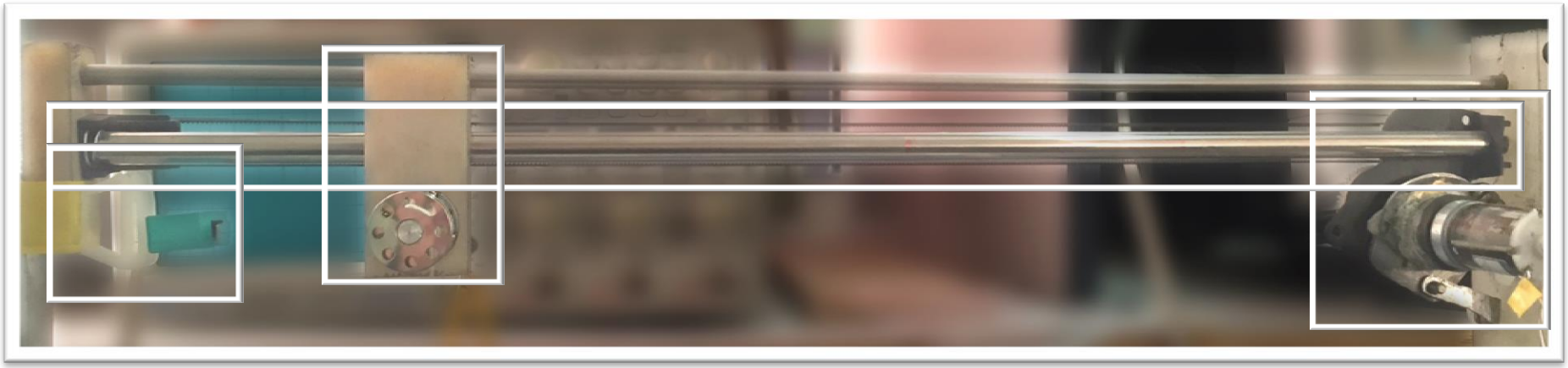
Design

2. The Vertical Arm



Design

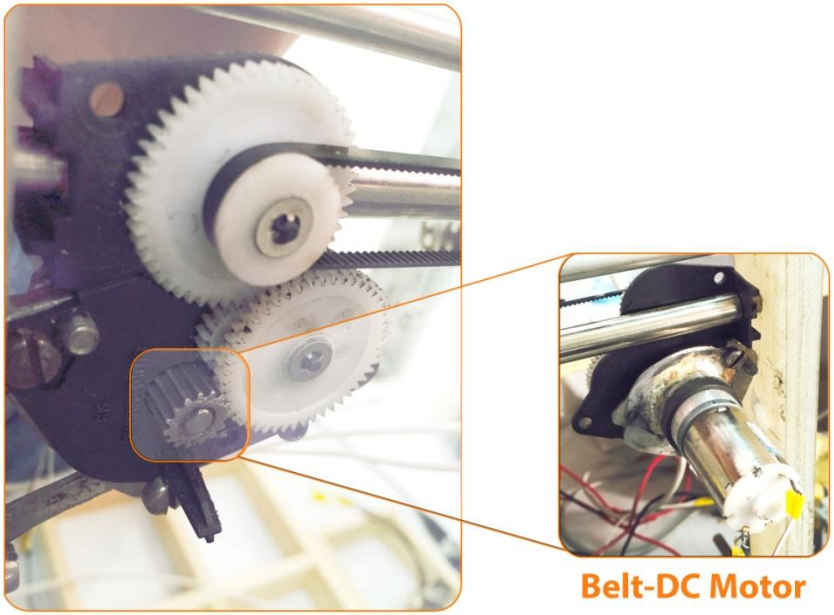
3. The Horizontal Arm
    1. Two Dc Motors.
    2. Pulley-Belt System.
    3. Housing Unit.
    4. Contactor.

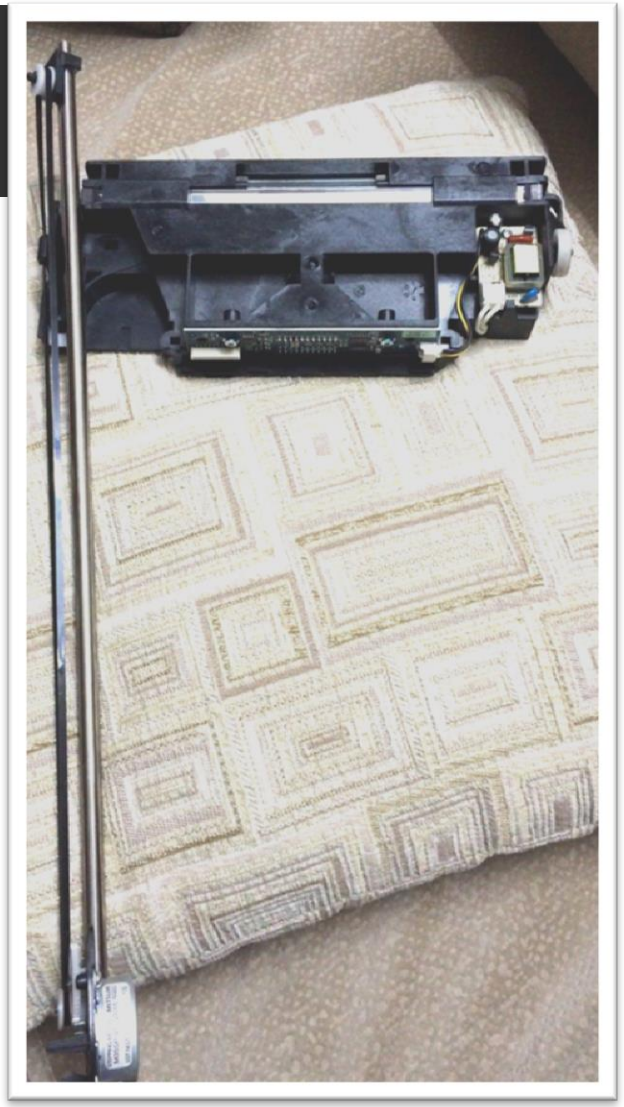


Design

3. The Horizontal Arm

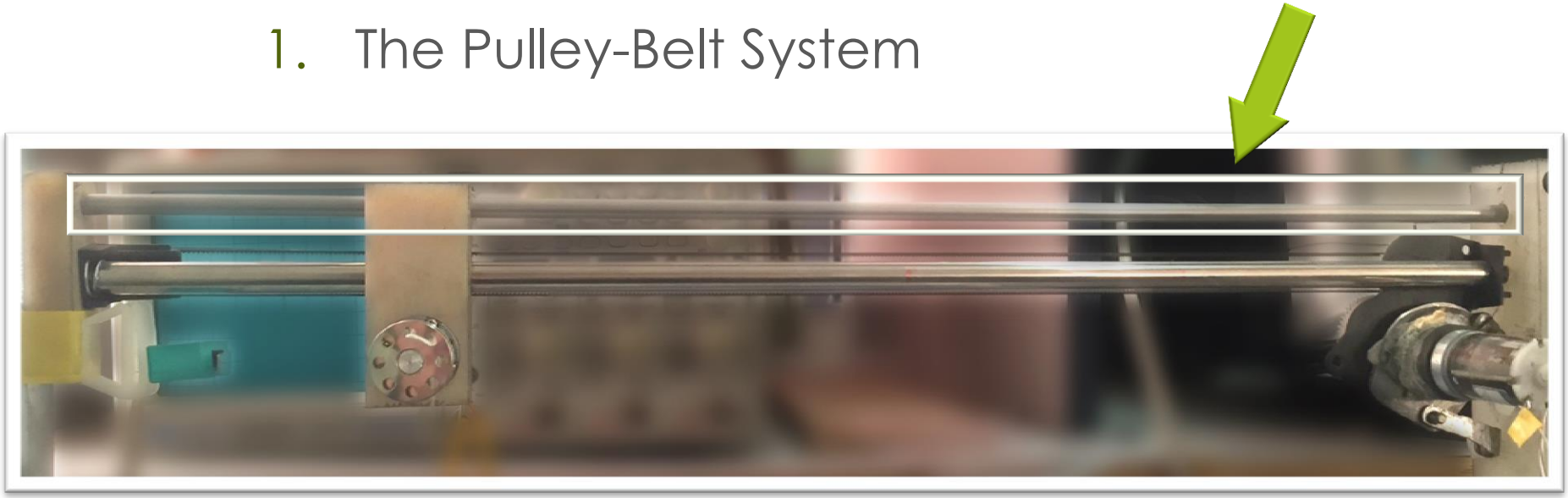
1. The Pulley-Belt System





Design

3. The Horizontal Arm
    1. The Pulley-Belt System



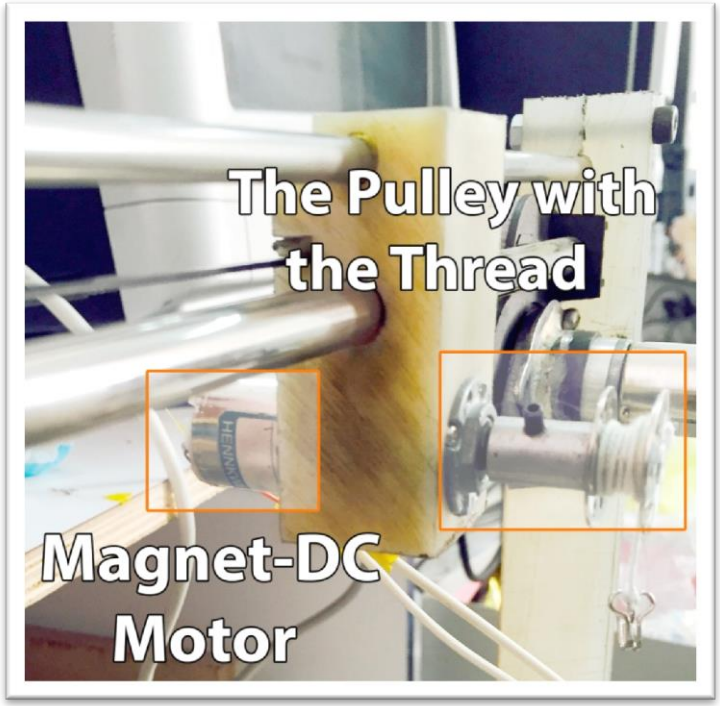
Design

3. The Horizontal Arm

2. The Housing Unit

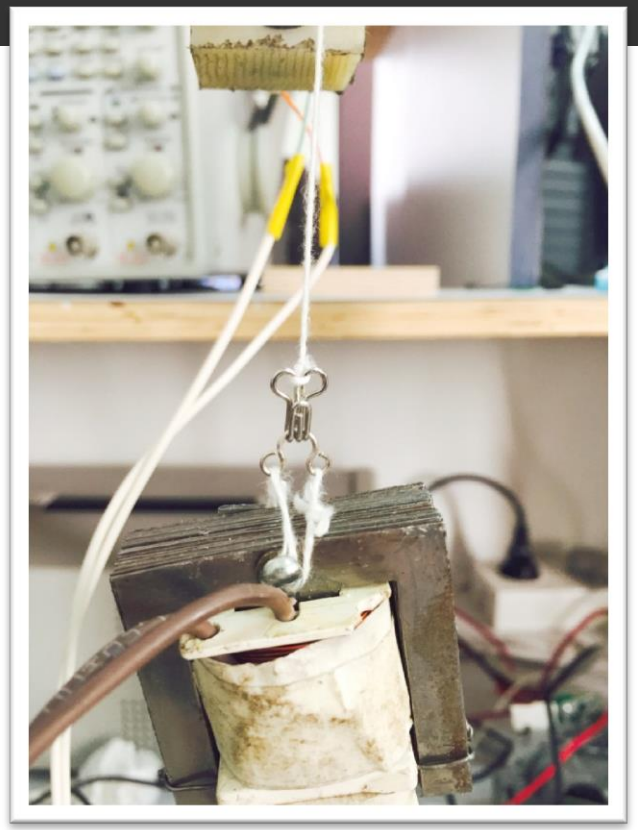
Consists:

- The Magnet-DC Motor.
- A Pulley.



Design

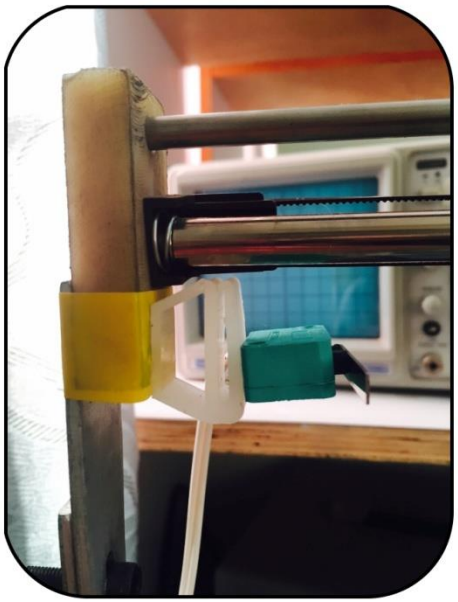
3. The Horizontal Arm
    3. The Electromagnet

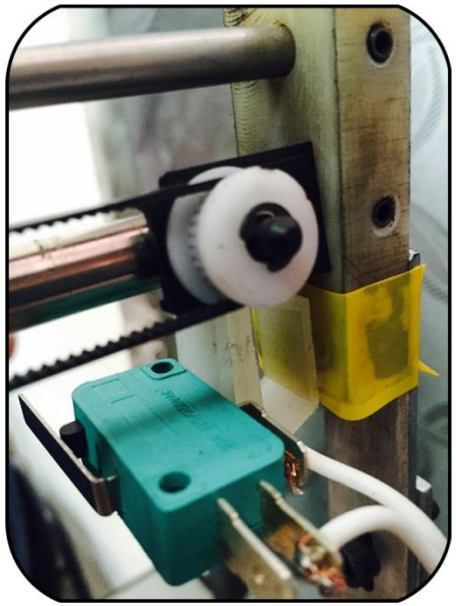


Design

3. The Horizontal Arm

    4. The Contactor





Design

4. The Supported Leg

Design

5. The Boxes

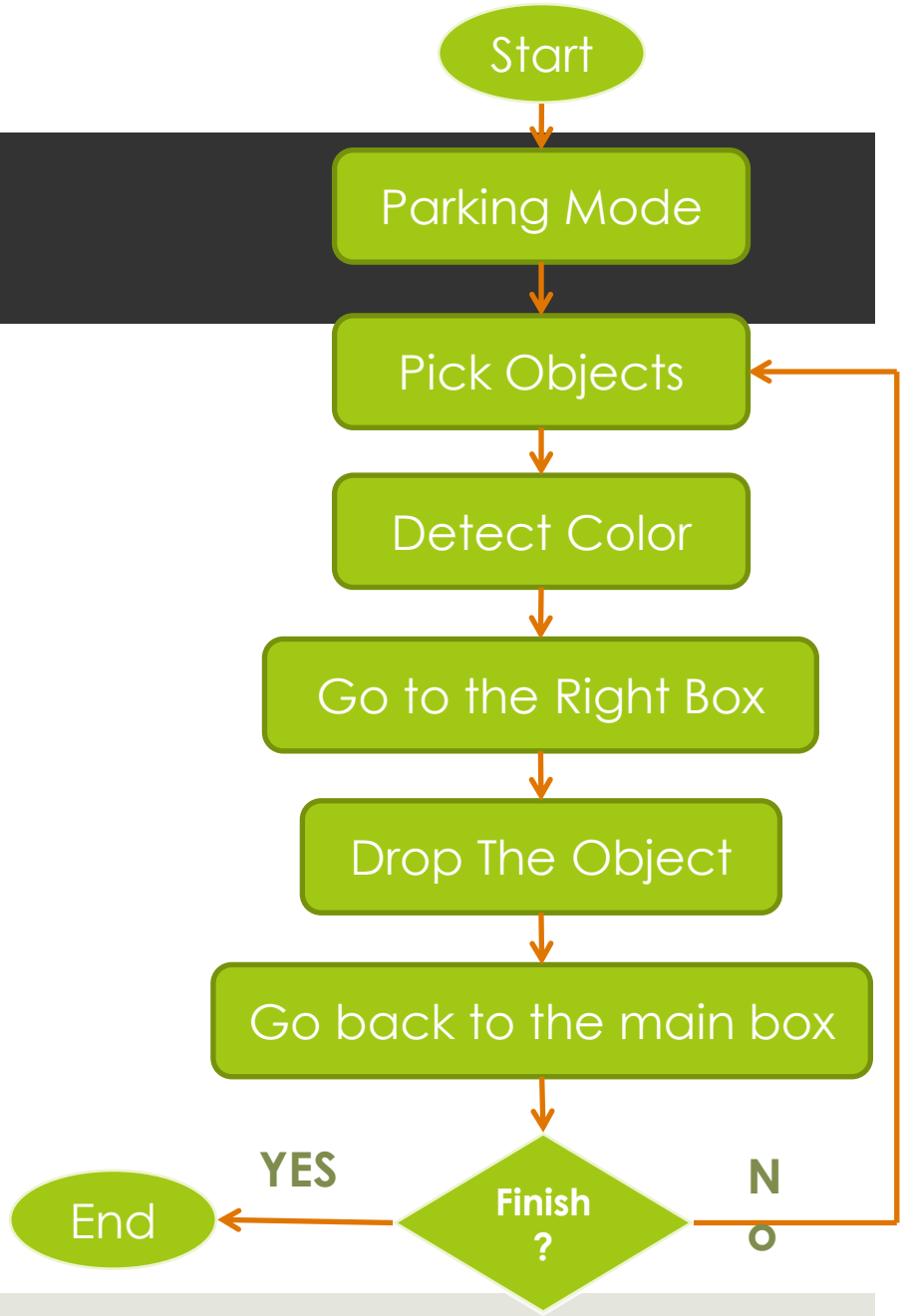
Design Summary

We have three DC motors

1. Motor 1 : Base-DC Motor
2. Motor 2 : Belt-DC Motor
3. Motor 3: Magnet-DC Motor

Implementation

Working Process



Implementation

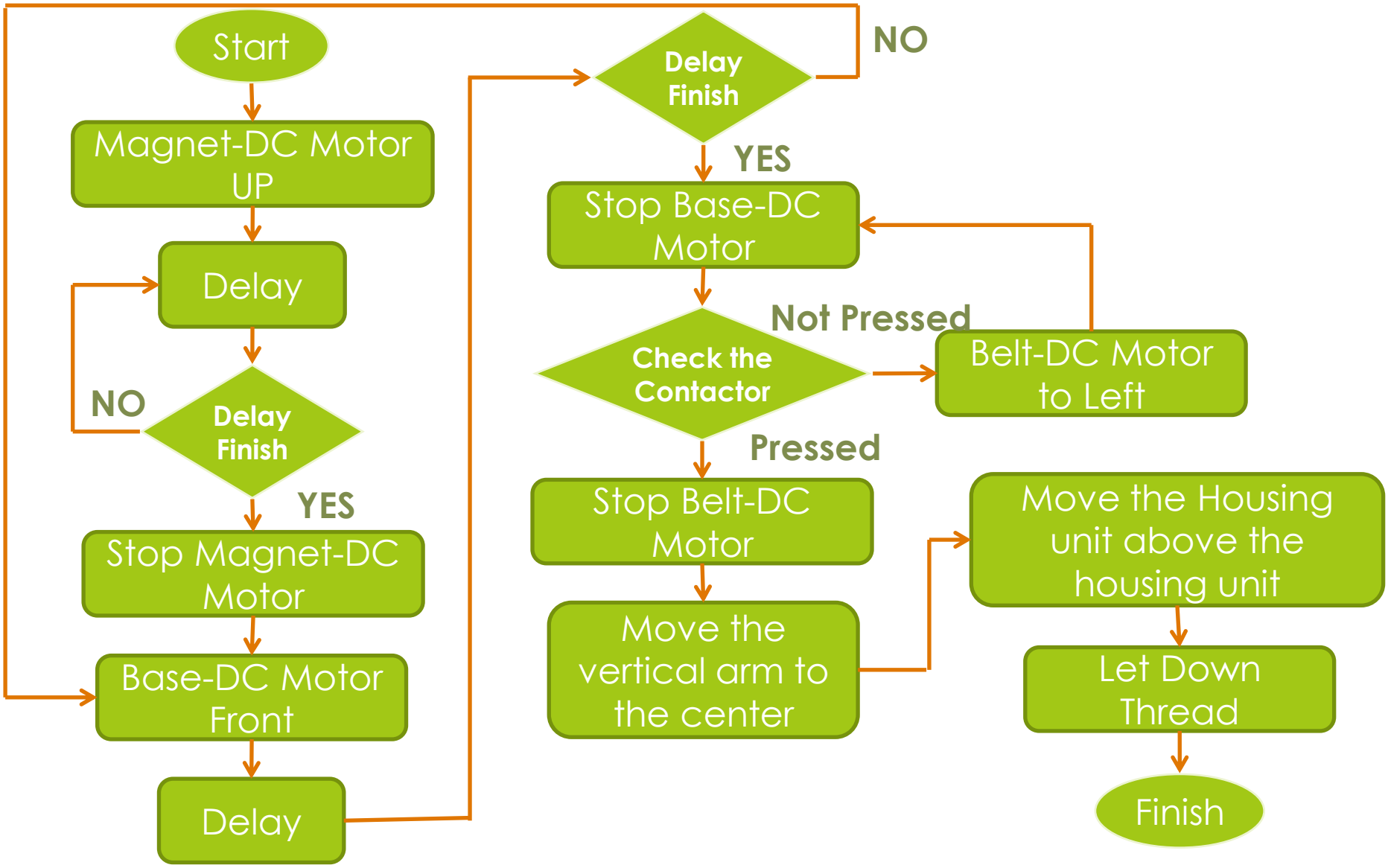
1. Parking Mode

   It is the Initial state of the system.

   Why did we add this step?

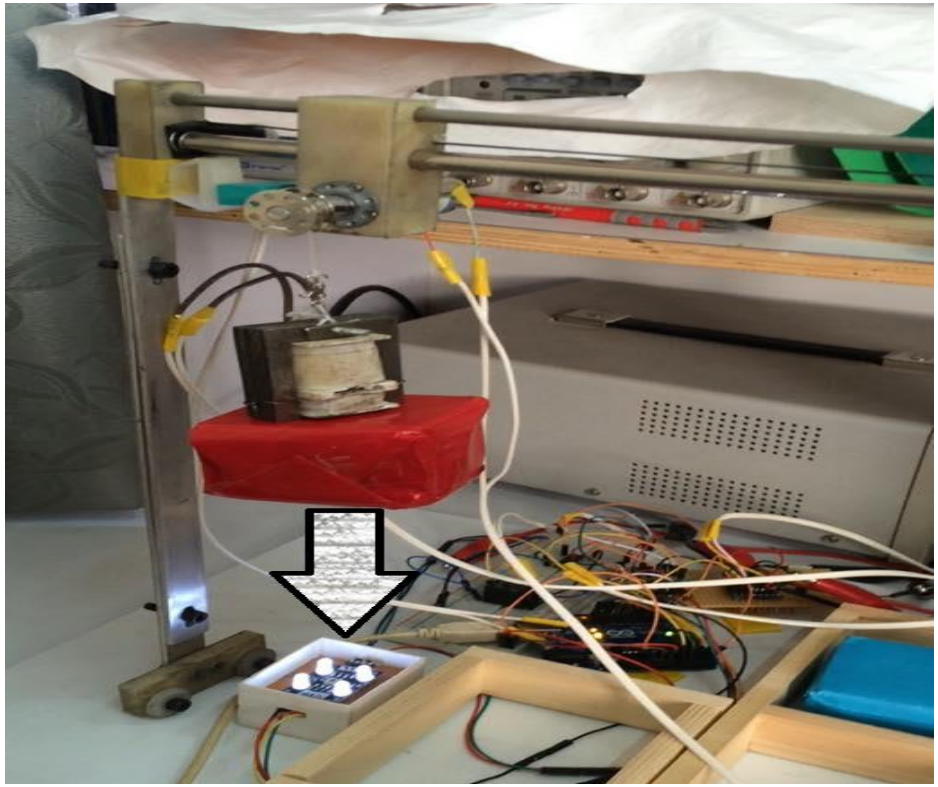
   - No memory unit.

Implementation -Parking Mode



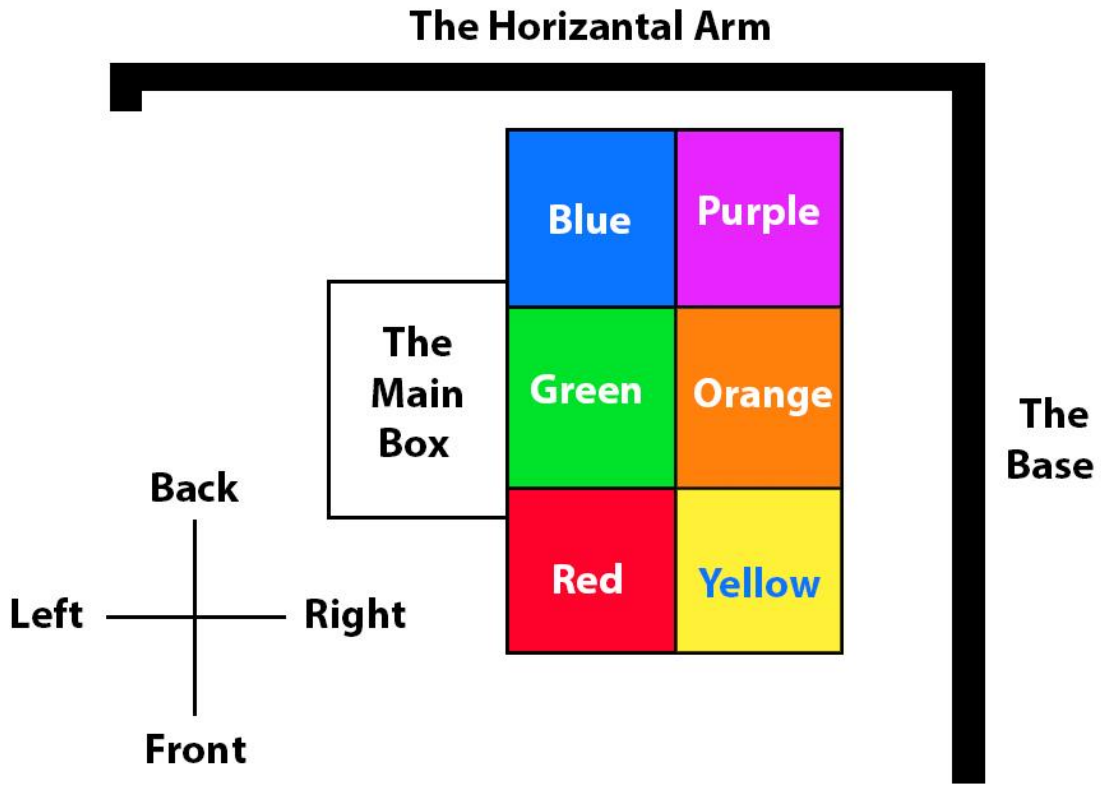
Implementation

2. Pick Object and Detect Colors



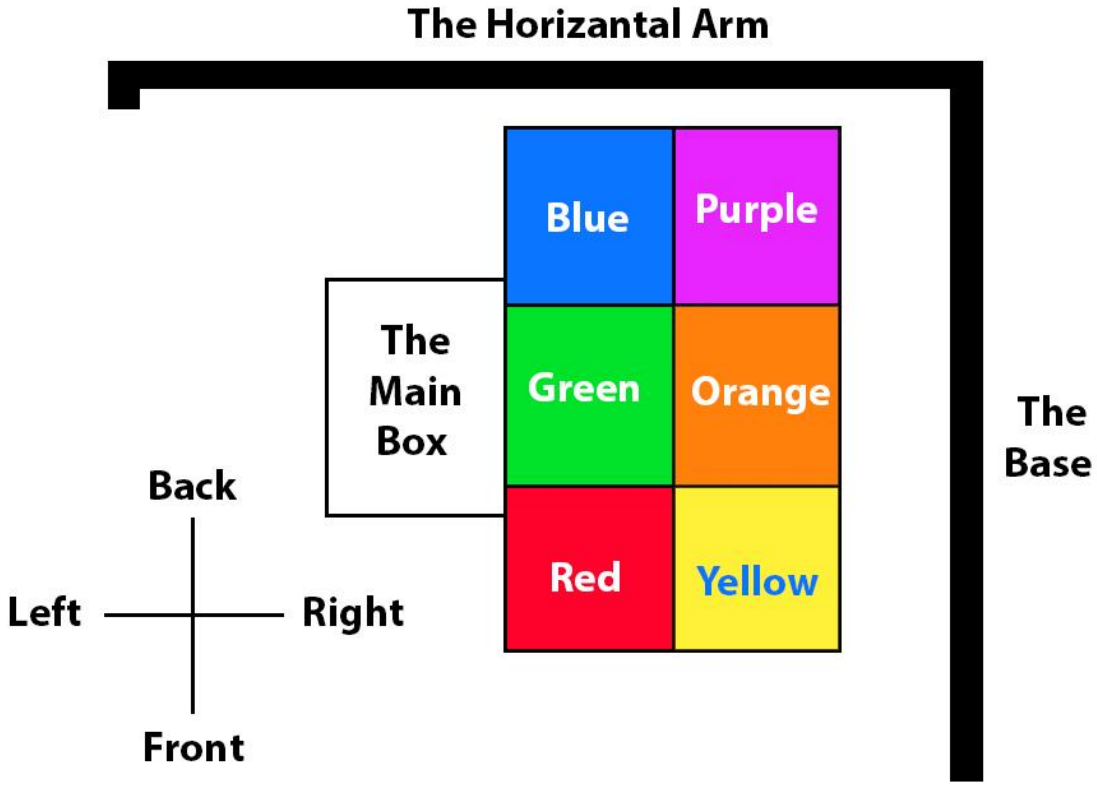
Implementation

3. Go To The Right Box



Implementation

4. Go back to the Main Box



Problems

1. Color Sensor

   It was very sensitive to light.

Solution:

1. Change the Color Sensor.
2. Put the Sensor in a small box.

Problems

2. Stepper motor.

   The speed of the color sensor was very low.

   Try writing new codes.

Problems

2. Stepper motor.

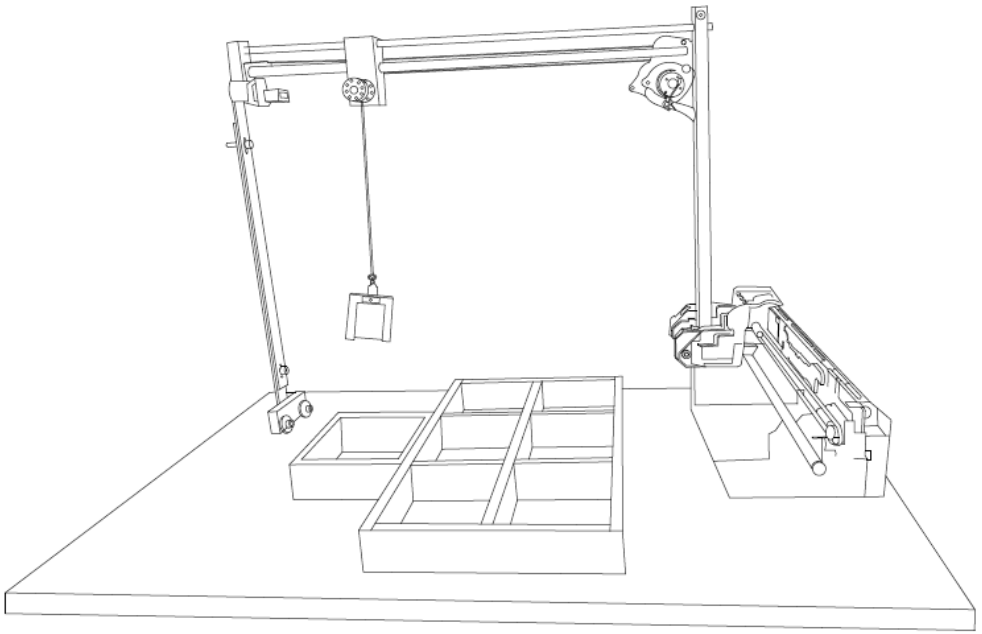
Solution:

1. Change the Stepper motor with a new DC motor.

Problems

3. Design

Solution:



Future Works

1. Replace DC motors by Stepper motors.
2. Change the magnetic with a hand .
3. Can develop a mobile application with Bluetooth

Demo Video

Thank You ☺ ☺