



AUTO

桌球

發射器

——112年專題報告——

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The background features a complex, abstract pattern of fine, wavy lines in shades of orange, yellow, and green, creating a sense of depth and movement. A large, dark, irregular shape is positioned in the upper center, partially obscured by the wavy lines. The overall effect is reminiscent of a microscopic view or a digital simulation.

研究背景

小孩無人陪伴?

2022全台雙薪占比



社會風氣的轉變，
單胎的小家庭占比劇增，
無人陪伴玩樂



網站:

<https://www.parenting.com.tw/article/5093637>

<https://pop-proj.ndc.gov.tw/chart.aspx?c=1&uid=61&pid=60>



研究目的

研究目的

結合自身所學與
參考美軍現役武器
設計一款桌球發射器



M777 榴彈砲

The background features a series of overlapping, diagonal stripes in various colors including blue, green, orange, purple, and yellow. Interspersed among these stripes are several circular shapes in different colors, some solid and some with a dotted pattern. The overall effect is a vibrant, abstract composition.

工具介紹



ESP-32

低功耗

低成本

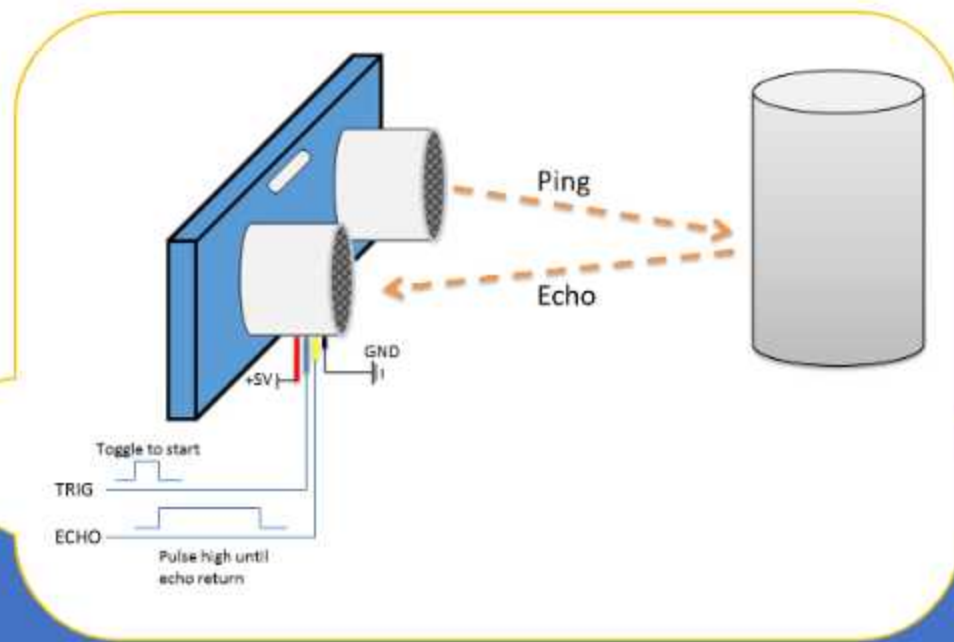
單晶片微控制器



ESP-32



HC-SR04





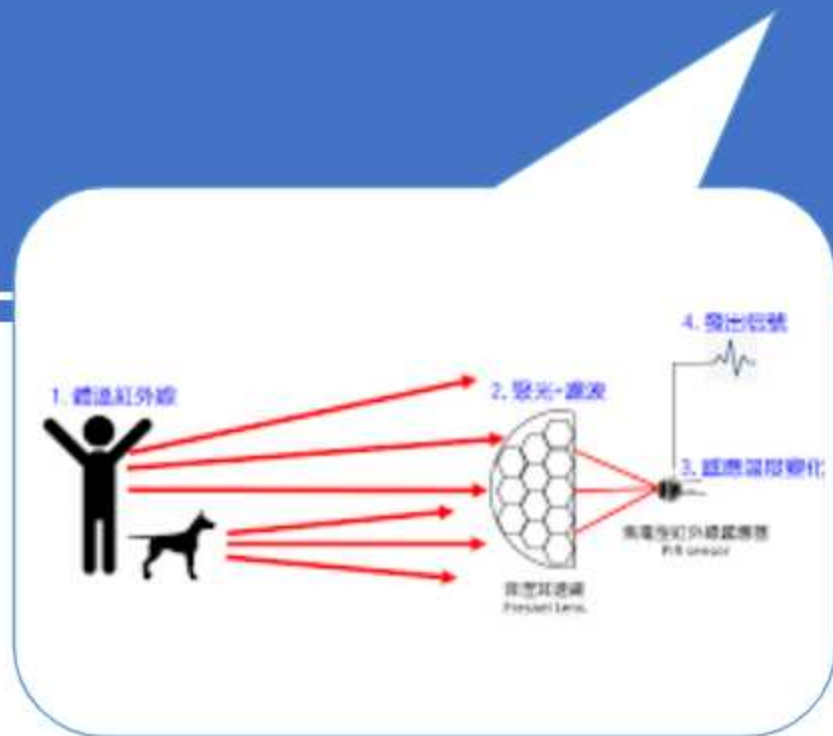
ESP-32



HC-SR04



HC-SR501





ESP-32



HC-SR04



HC-SR501

AUTODESK

inventor



約略等於





ESP-32



免費的編程工具



HC-SR501

AUTODESK

Arduino

inventor





ESP-32

3D打印機的G Code 生成程式



HC-SR501

AUTODESK

Arduino

Cura

inventor





ESP-32

進行雷射切割控制的APP

AUTODESK

Arduino

Ultmaker Cura

Laserbox

inventor





SG-90

按壓氣閘

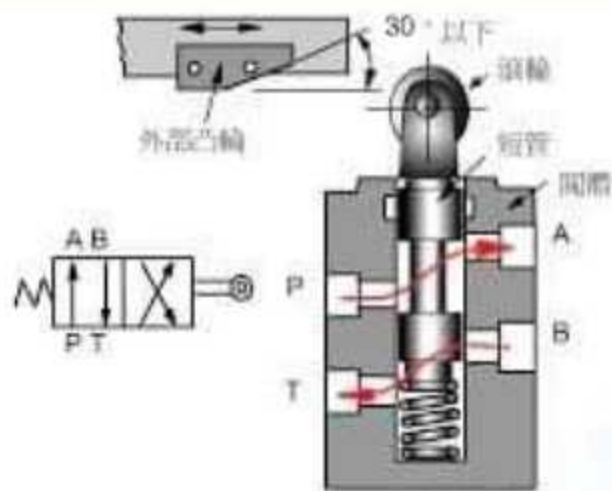


圖6.20 凸輪型機械操作方向切換閥

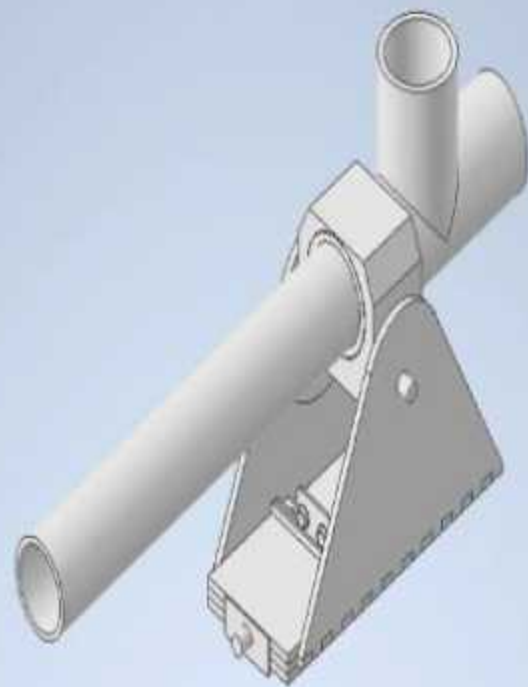




機構簡介

整體架構

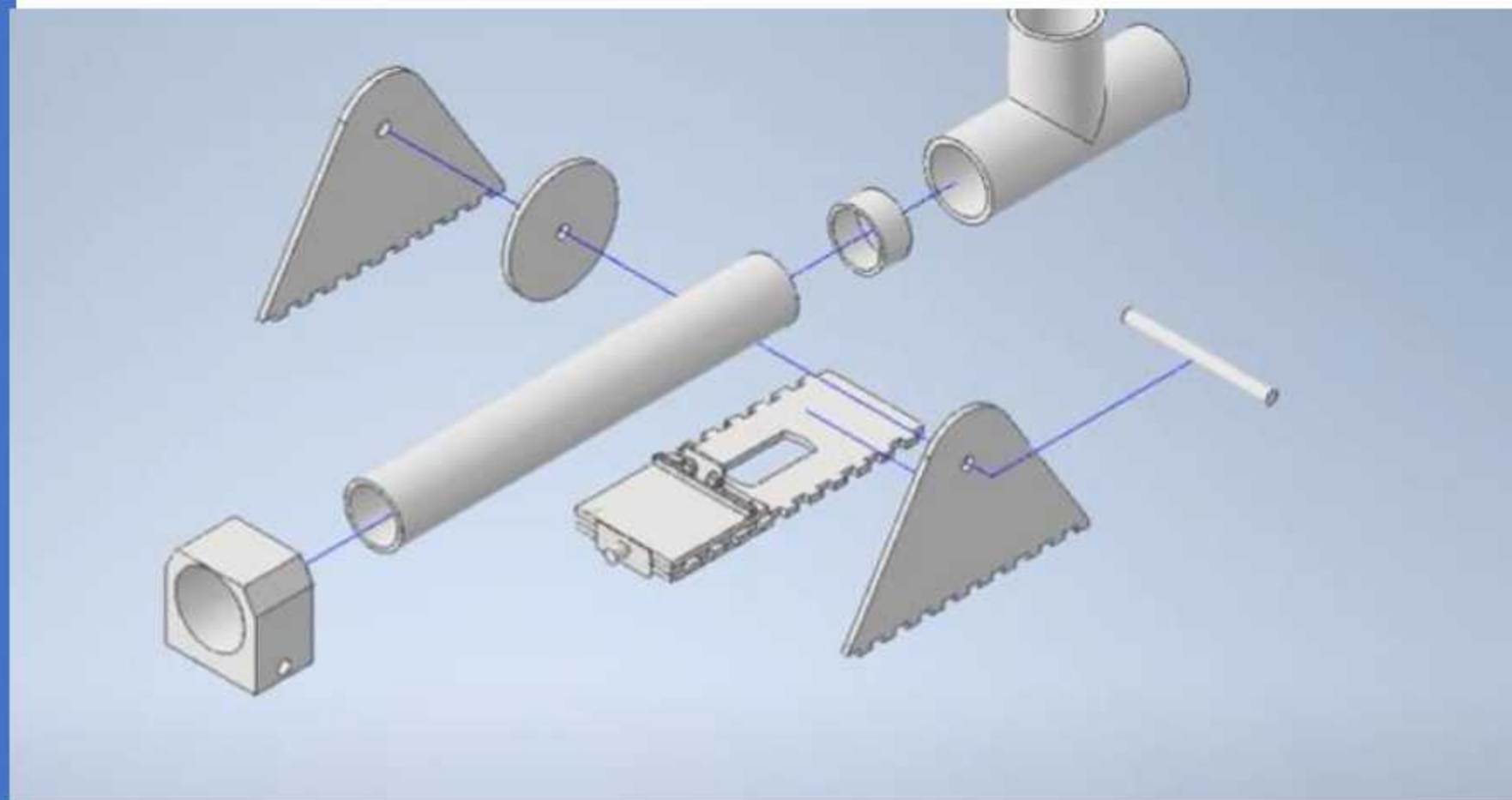
與設計



整體架構

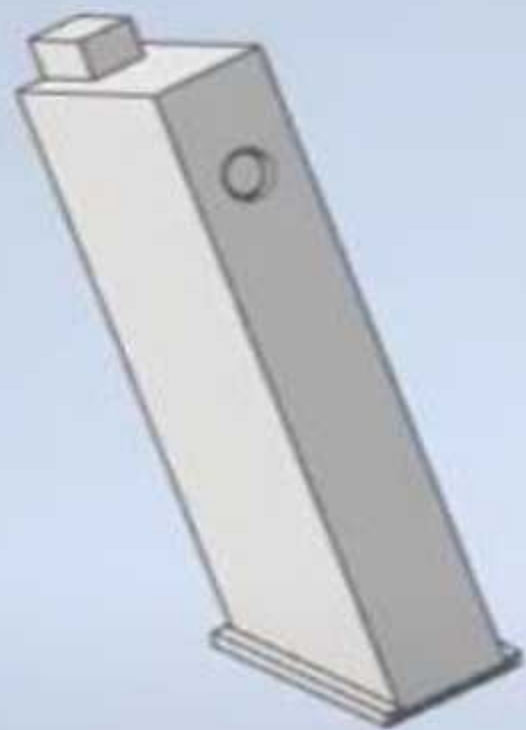
與設計

爆炸圖



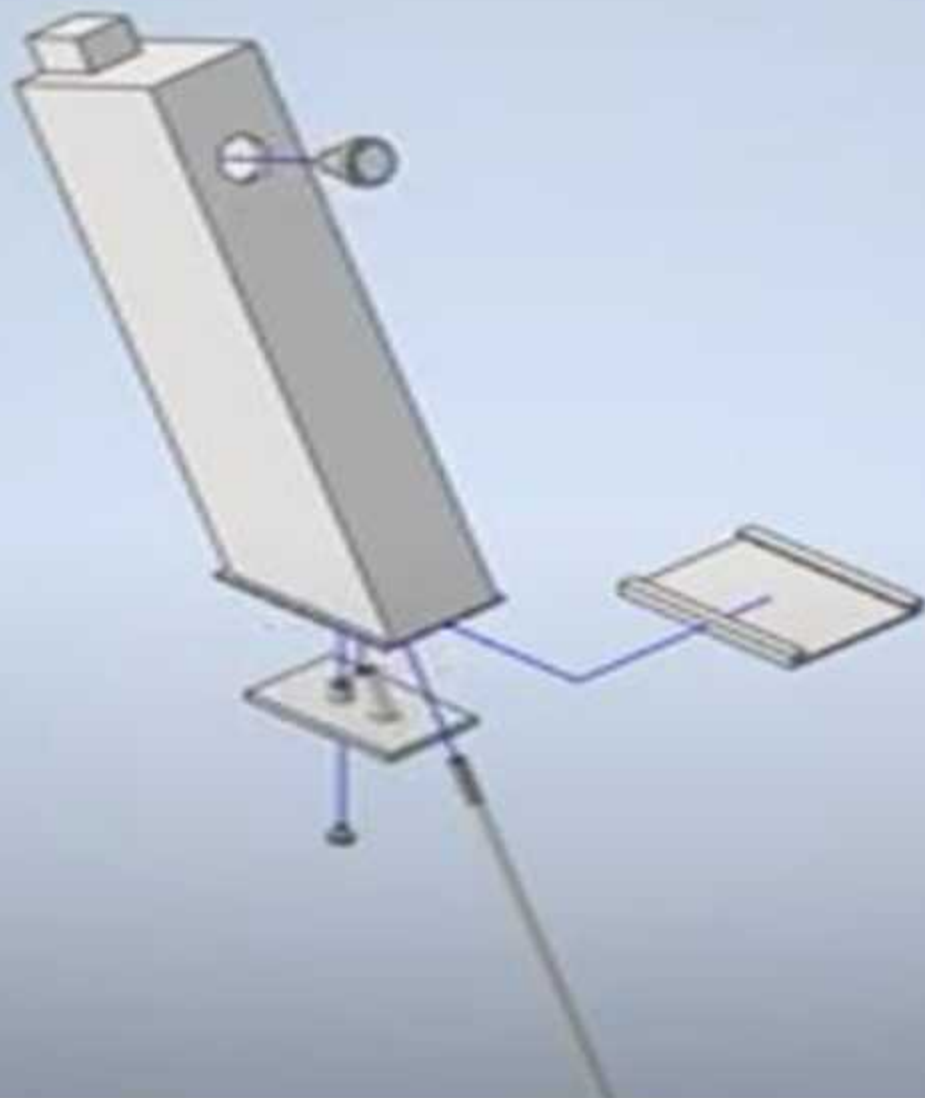
發射裝置

與設計



發射裝置

與設計
(爆炸圖)




```
mirror_mod.use_x = False
mirror_mod.use_y = True
mirror_mod.use_z = False
operation = "MIRROR_Z"
mirror_mod.use_x = False
mirror_mod.use_y = False
mirror_mod.use_z = True
```

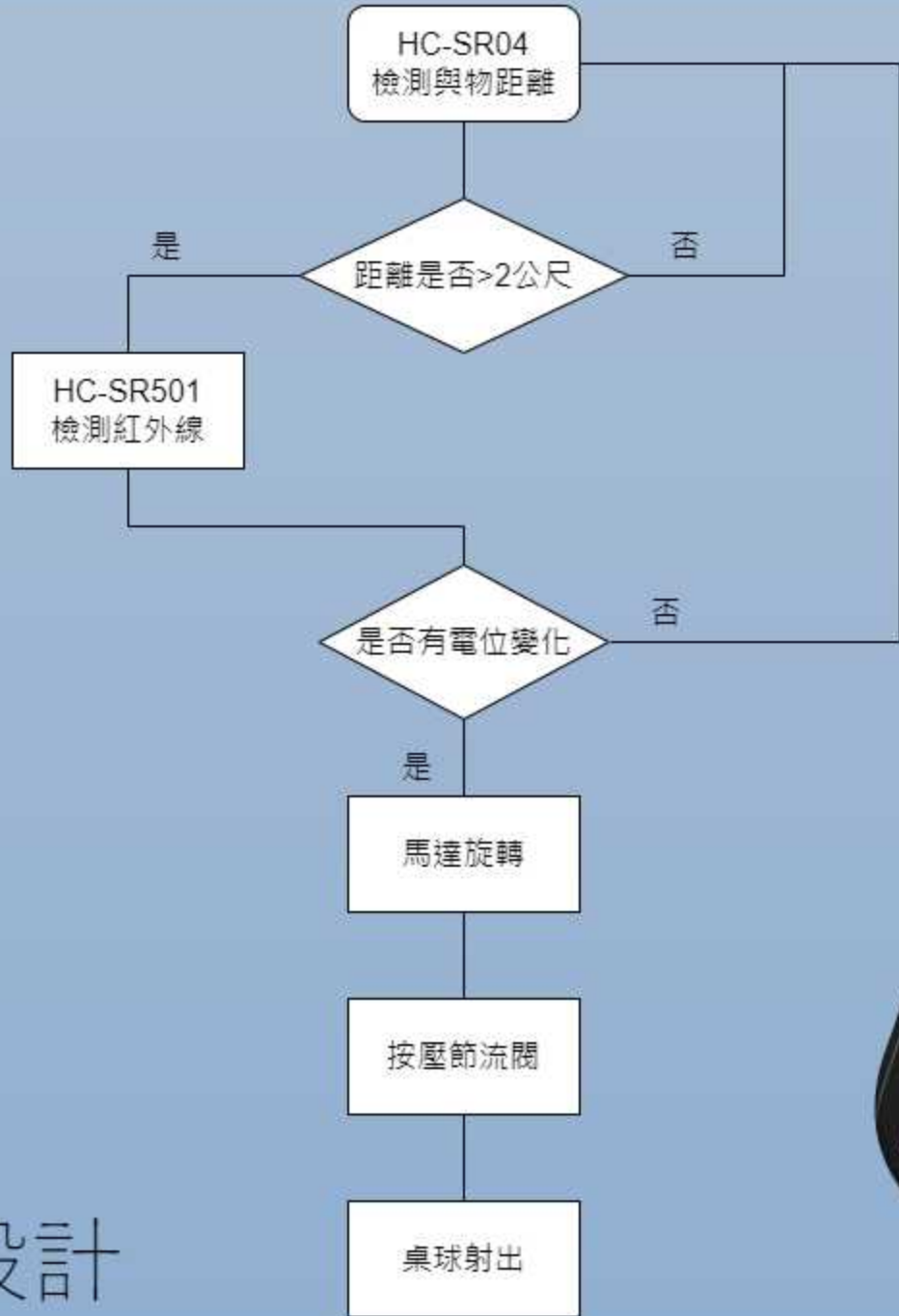
```
selection at the end -add
mirror_ob.select= 1
modifier_ob.select=1
context.scene.objects.active
("Selected" + str(modifier_ob.name))
mirror_ob.select = 0
bpy.context.selected_objects
data.objects[one.name].select
print("please select exactly
```

-- OPERATOR CLASSES -----

程式設計

```
types.Operator):
X mirror to the selected
object.mirror_mirror_x"
Y"
```

```
context.active_
```



```

sensor = 9; //訊號線

void setup() {
  Serial.begin(9600);
  pinMode(sensor, INPUT);
}

void loop() {
  unsigned long d=ping()/58; //計算距離
  Serial.print(d);
  Serial.println("cm");
  delay(1000);
}

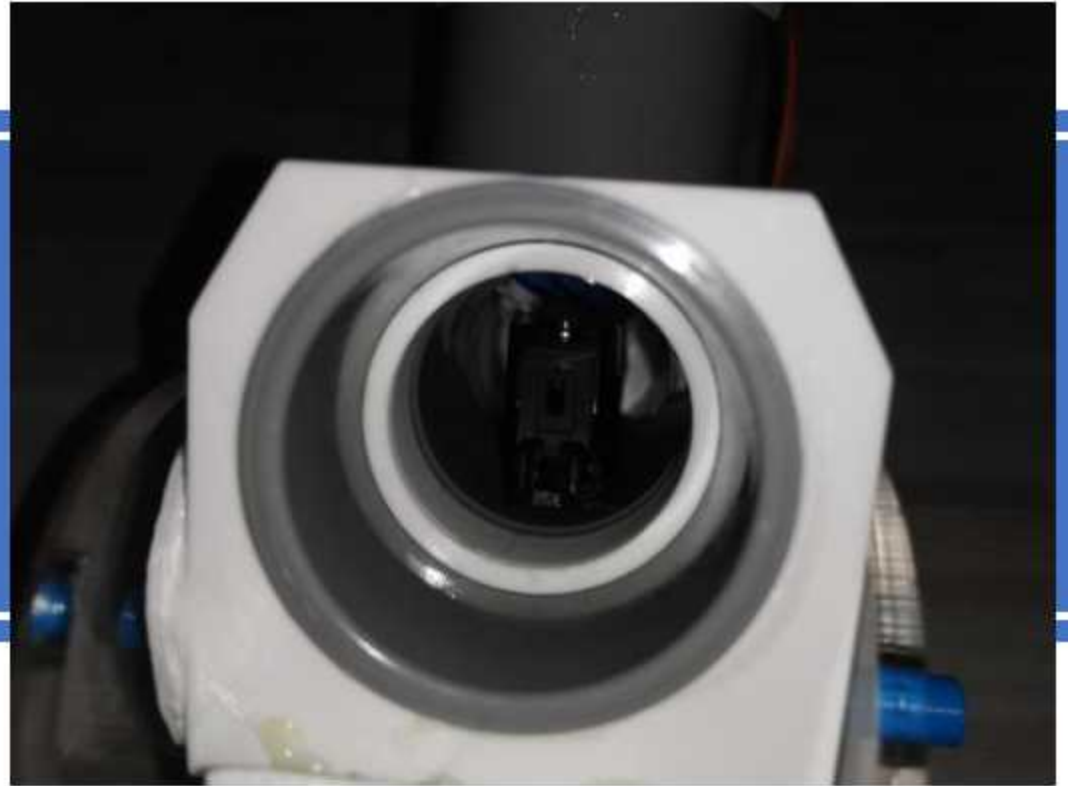
/*副程式
*Send 10us pulse to HC-SR04 trigger pin
*/
unsigned long ping() {
  digitalWrite(trigPin, HIGH); //啟動超音波
  delayMicroseconds(10); //sustain at least 10us HIGH pulse
  digitalWrite(trigPin, LOW); //關閉超音波
  return pulseIn(echoPin, HIGH); //計算傳回時間
}
  
```

程式設計



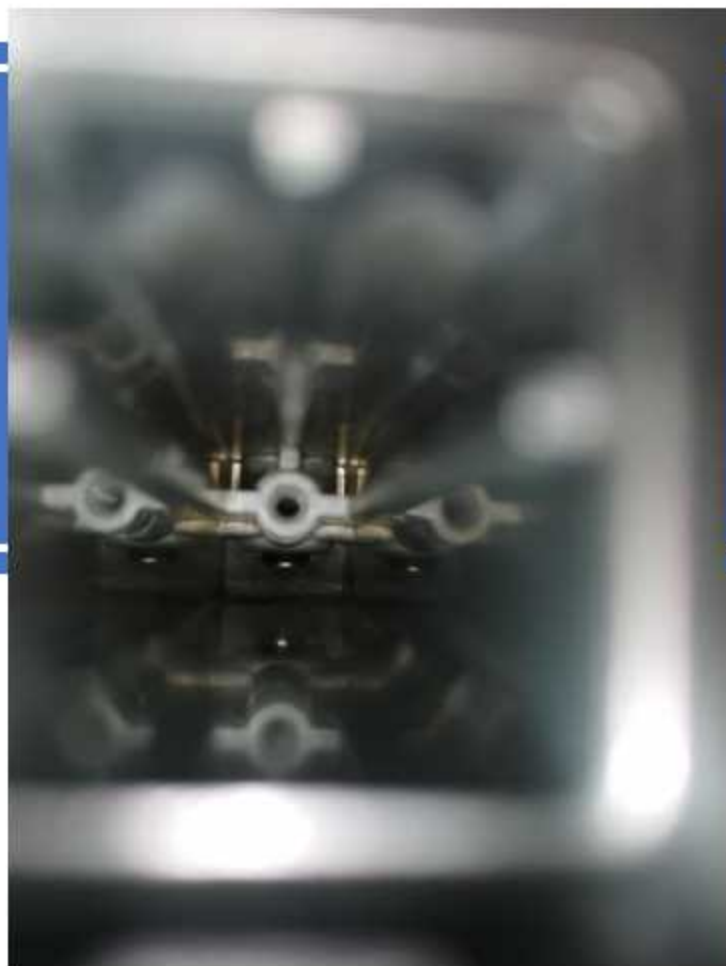
成品展示

滑坡

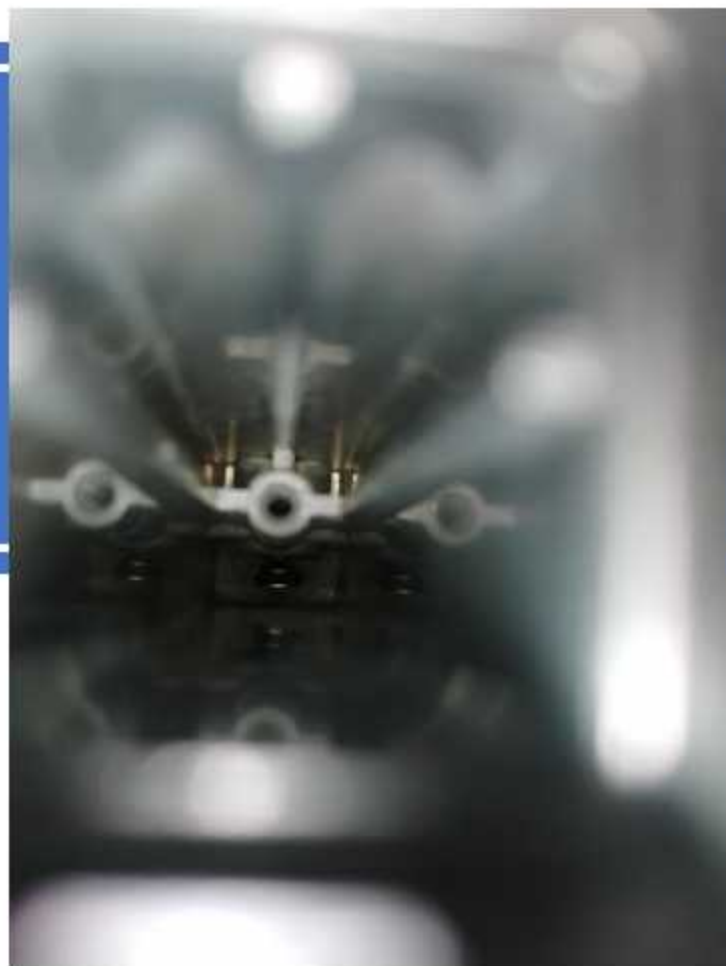


氣瓶 與 按壓氣閥閥

關(尚未按下)



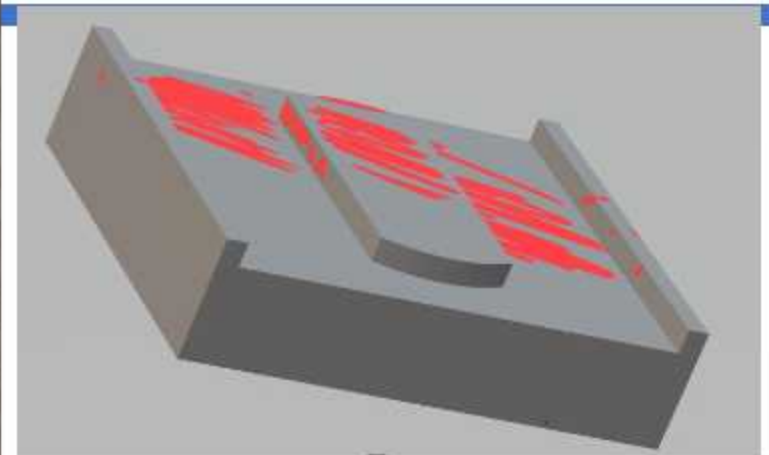
開(已按下)



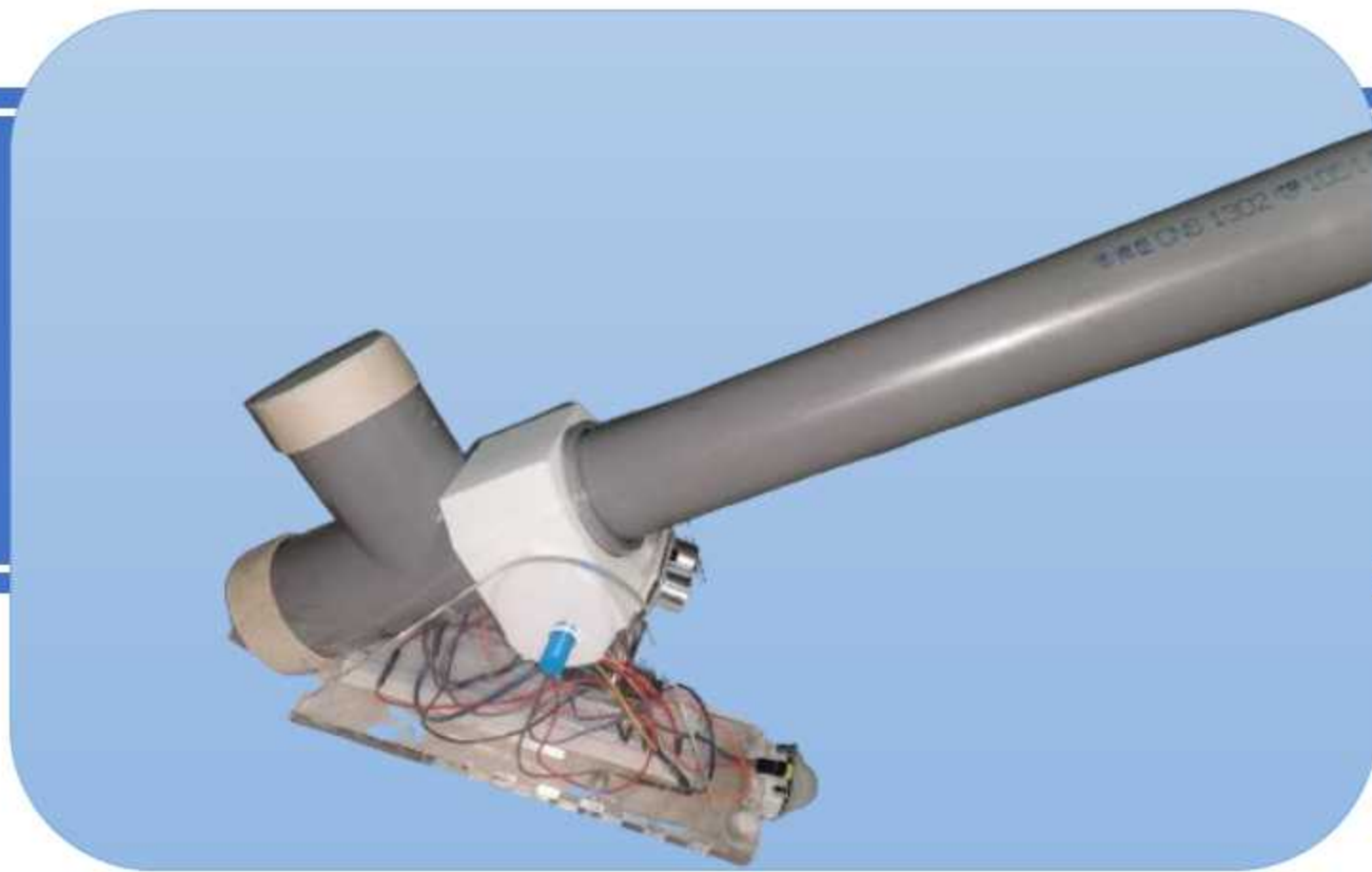
發射管(上部分)



支撐架(下部分)



成品圖



成品影片

與擊發演示

網址:

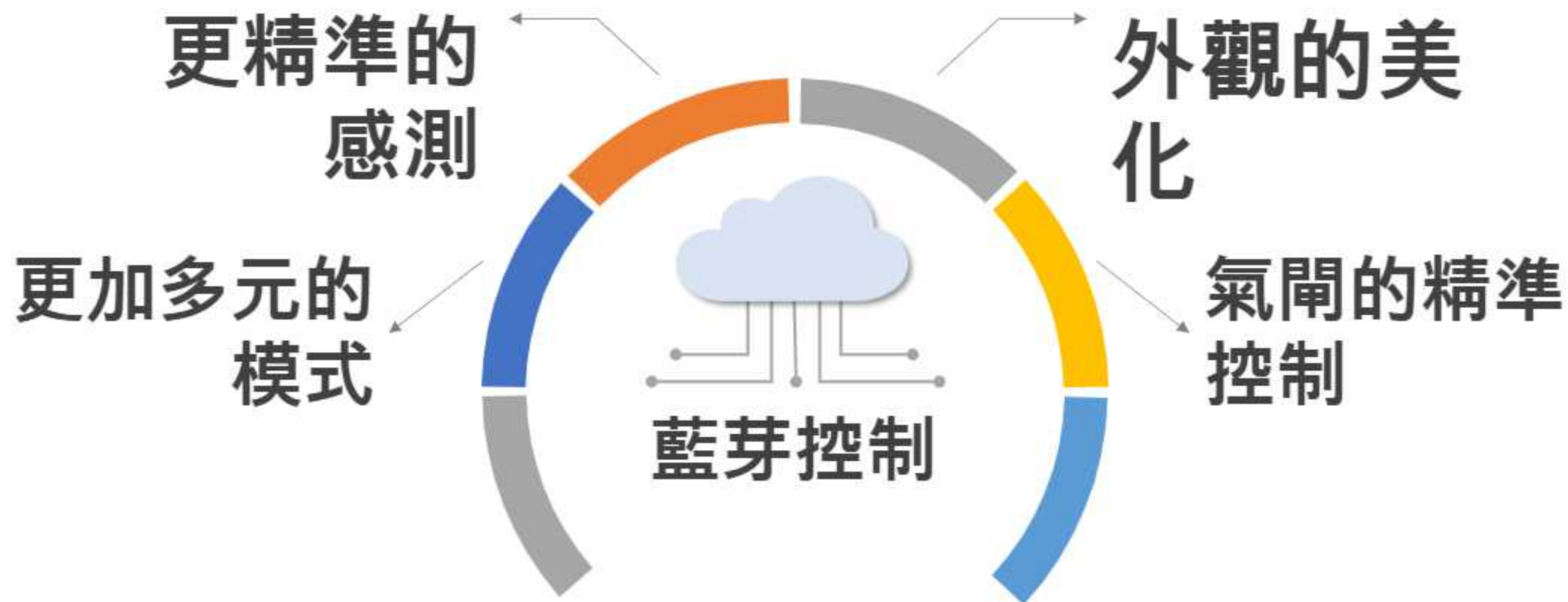
<https://youtube.com/shorts/SY7SsiUzBTY>



未來展望



未來展望





參考網站

Infographic Style

<https://shop.mirotek.com.tw/iot/esp32-start-10/>



<https://blog.jmaker.com.tw/>

https://blog.jmaker.com.tw/hc_hr501/

<https://www.tinkercad.com/>