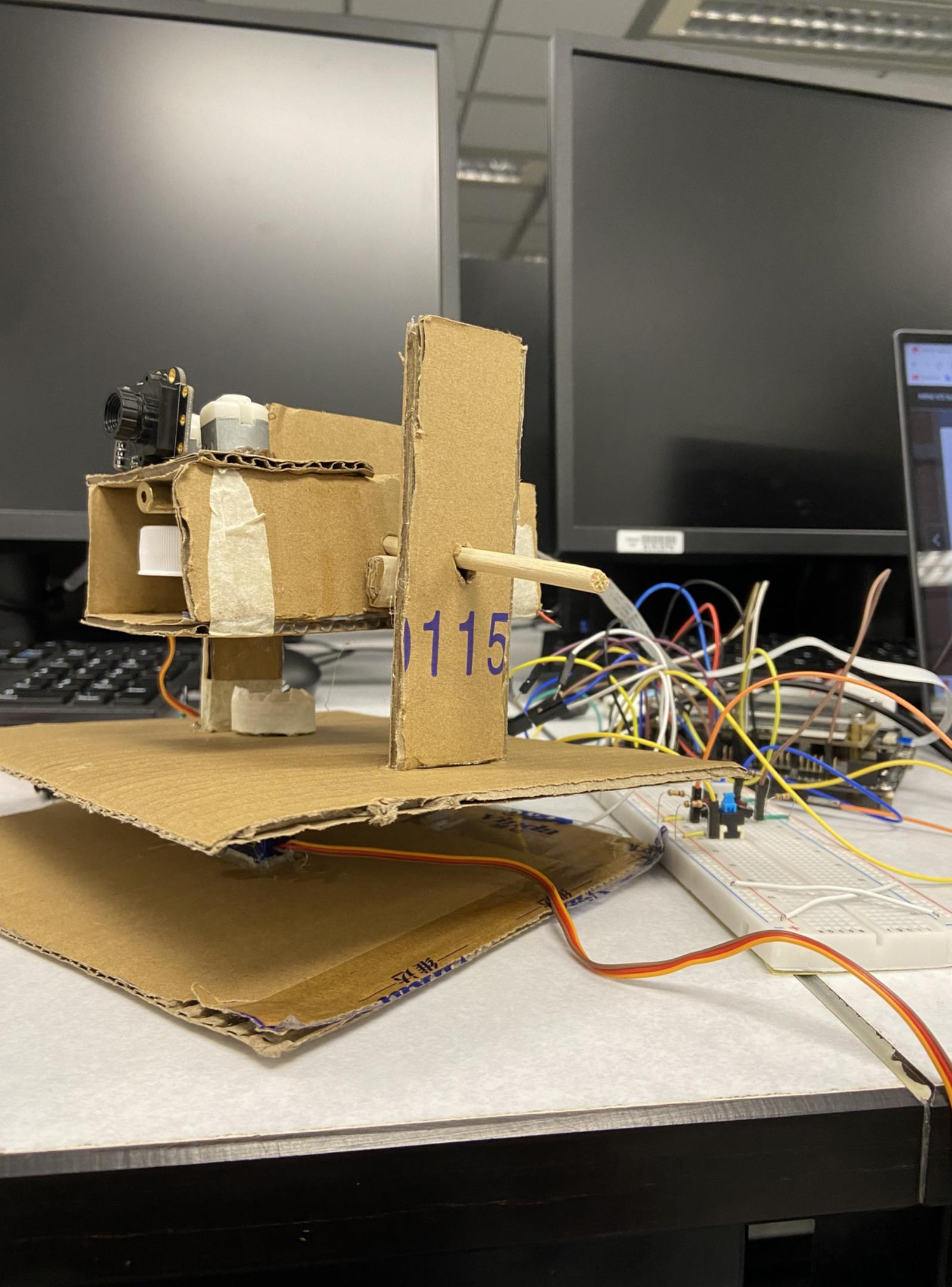


Auto-Targeting Turret

KWOK, Kin Sang
LAU, Chi Hong



FUNCTIONS

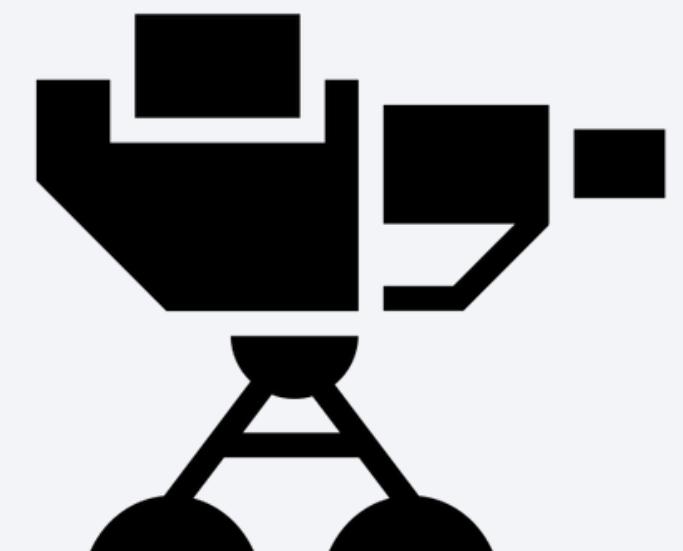


01 Auto-targeting

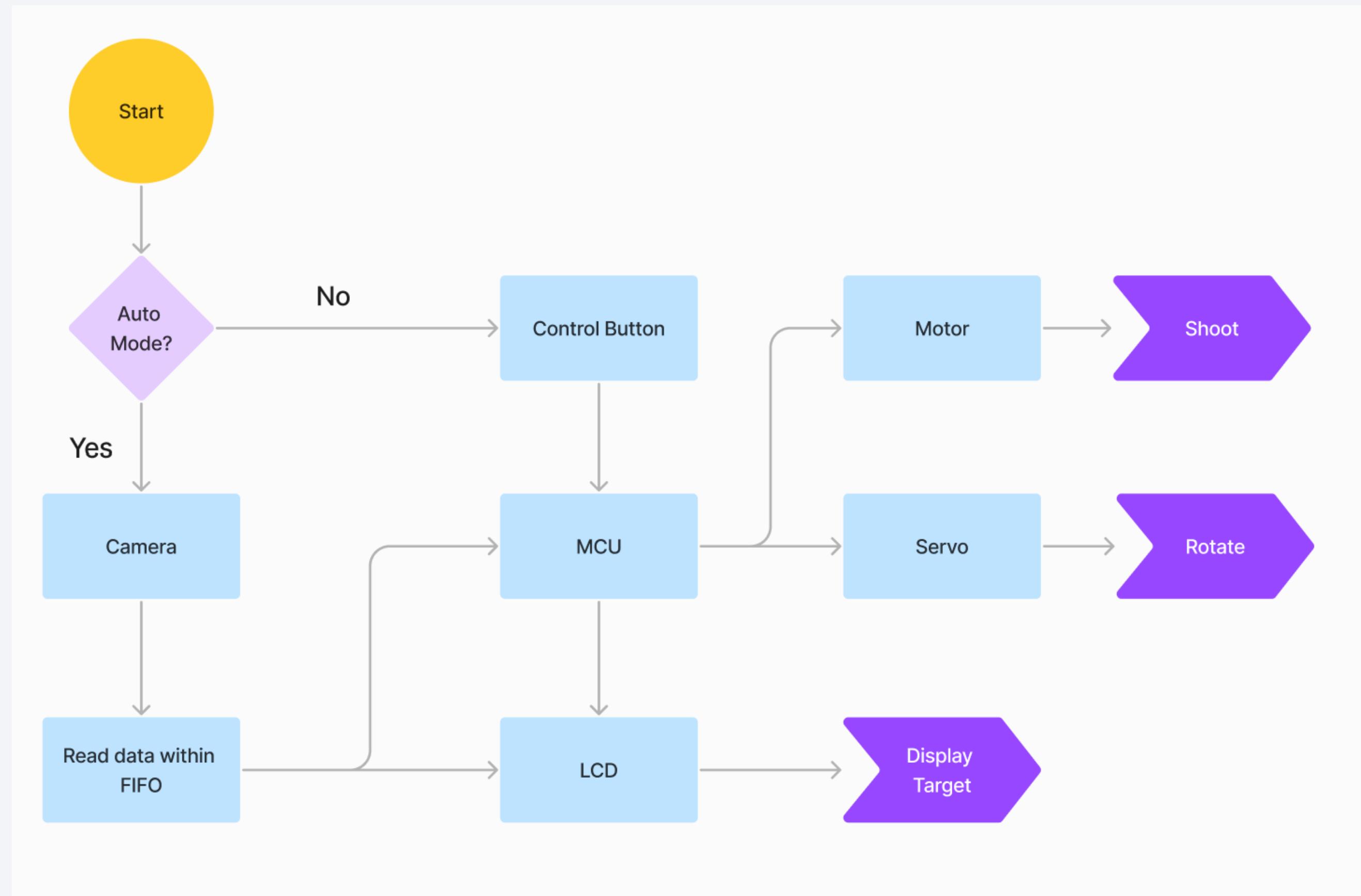
03 Shooting

02 Vertical and Horizontal
Rotation

04 Manual Control



Original Structure



Camera (OV7725)

Bulit-in FIFO

- AL422B - RAM -> Act as buffer
- First VSYNC
- Data Bits would be written into the buffer
- Second VSYNC
- Read data(RGB565) in FIFO (2 PLCK to form one pixel of image)
- Loop back to the top

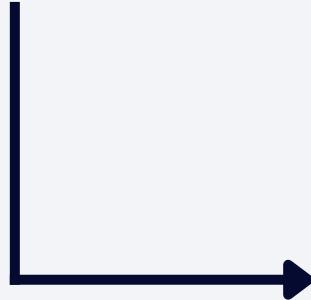
Tracking

- Use laser as guidance
- Check the RGB565 in each pixel
- If the R value is high, while the G and B values are low, the laser dot would be located
- Camera move in small intervals, to avoid error when the laser is located at different distance from the camera
- After moved into the correct position, the motor would be turned on

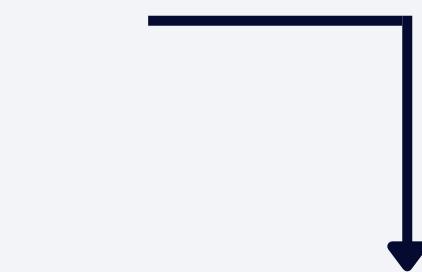
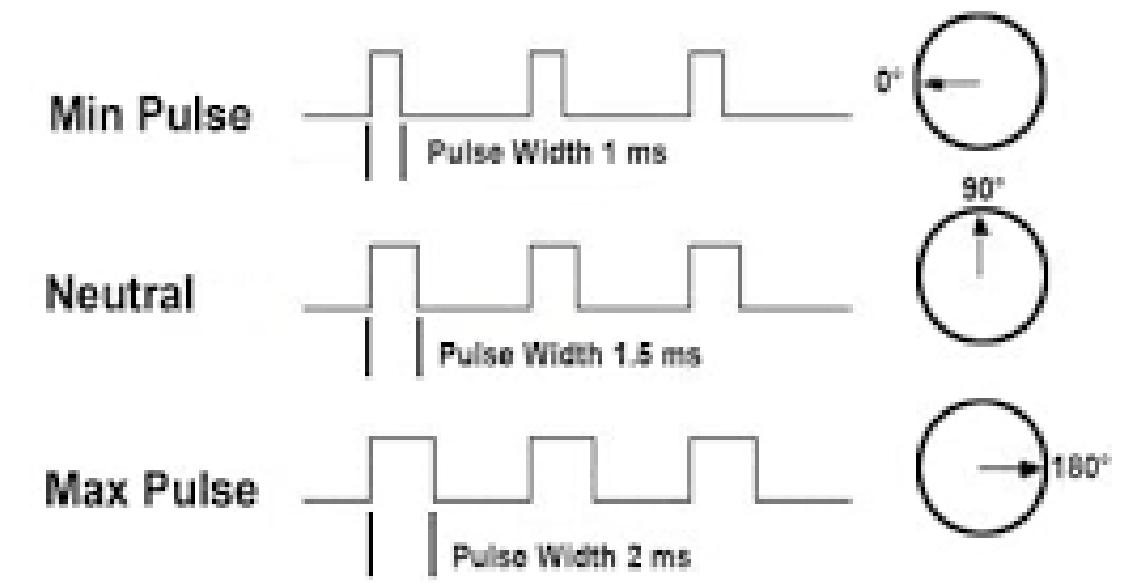
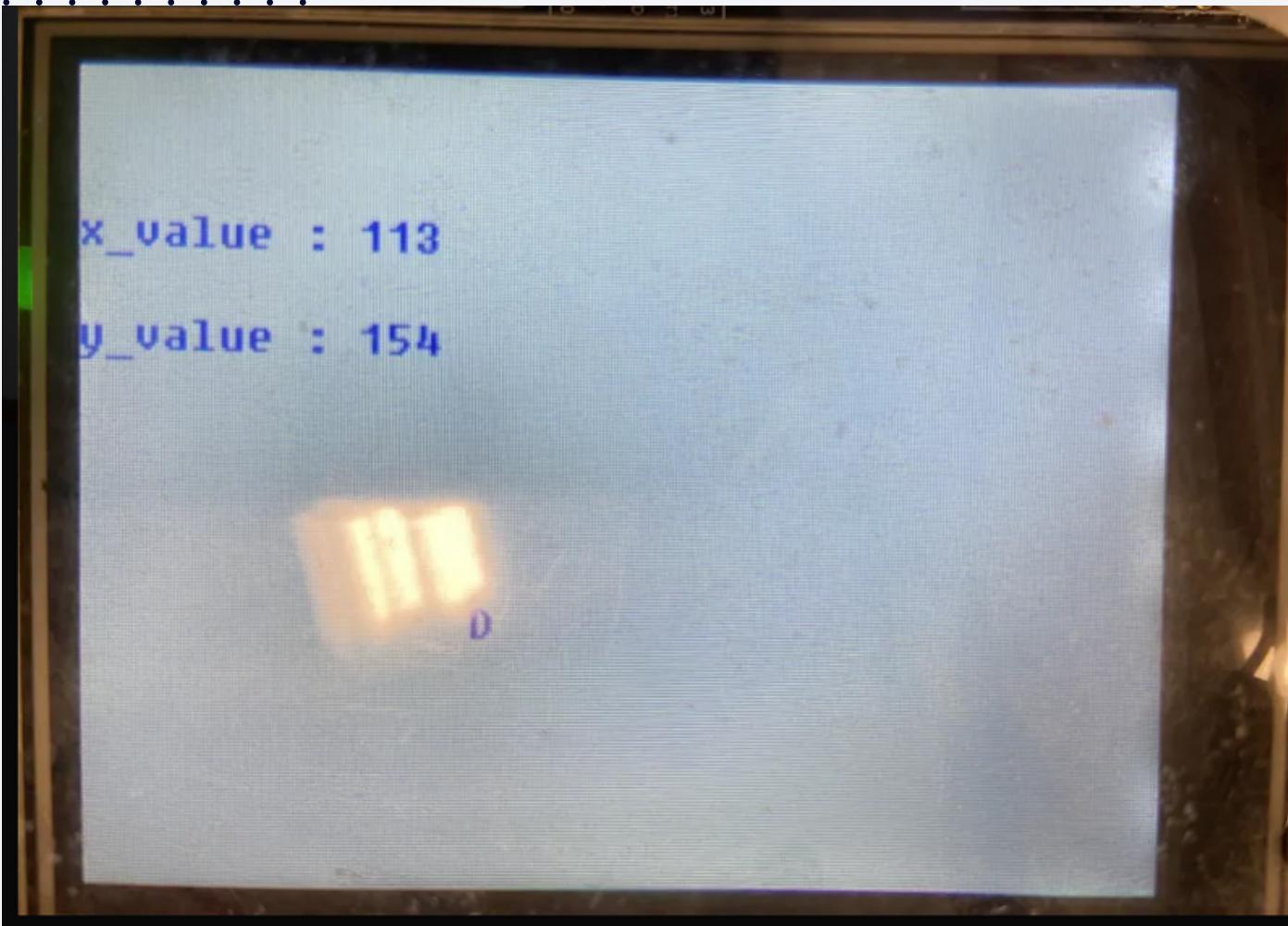


Real-Time Processing

- Seeking the target
(Where it is in term of pixels)



PWM



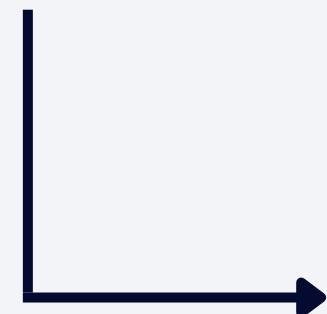
Generate Pulse

- Calculated Pulse for servos
(Moving in small intervals)
- Help turret move toward the target
- Enable shooting when target is where the turret is pointing to

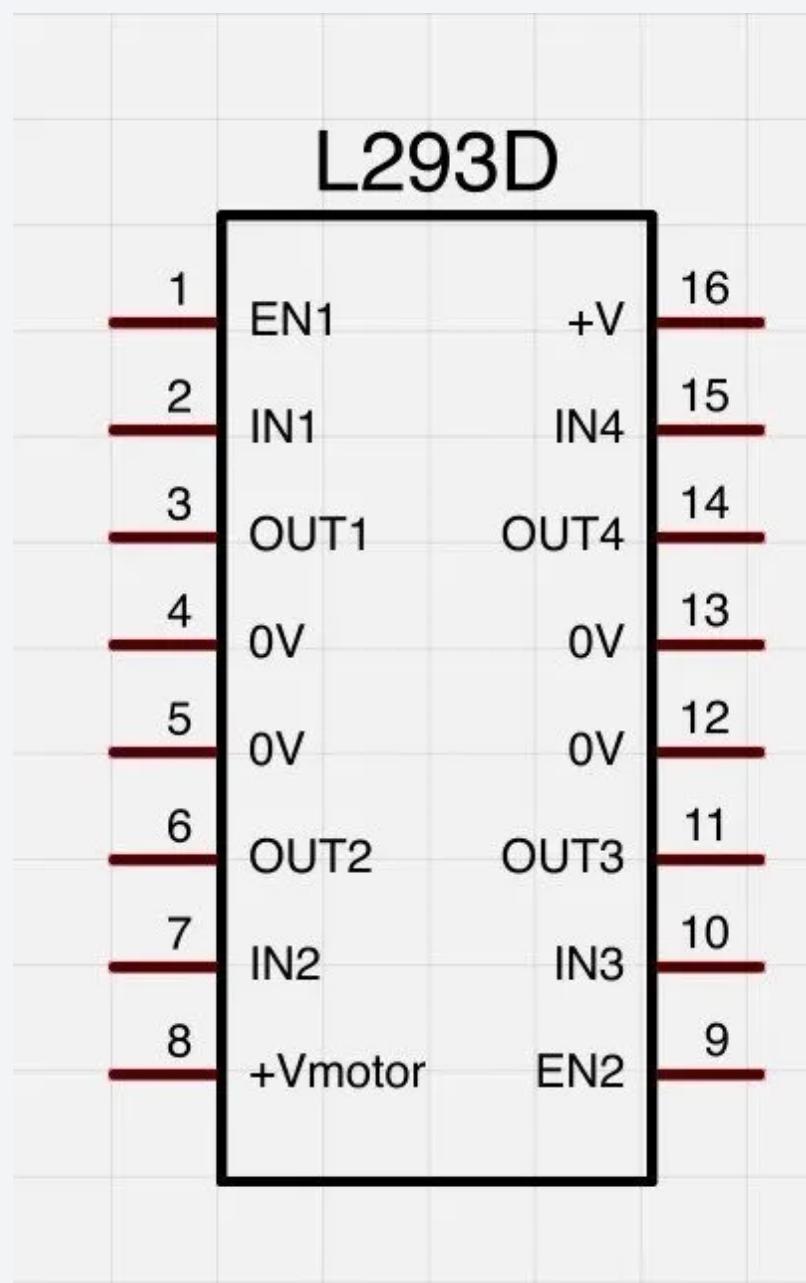
MOTOR CONTROL

PWM

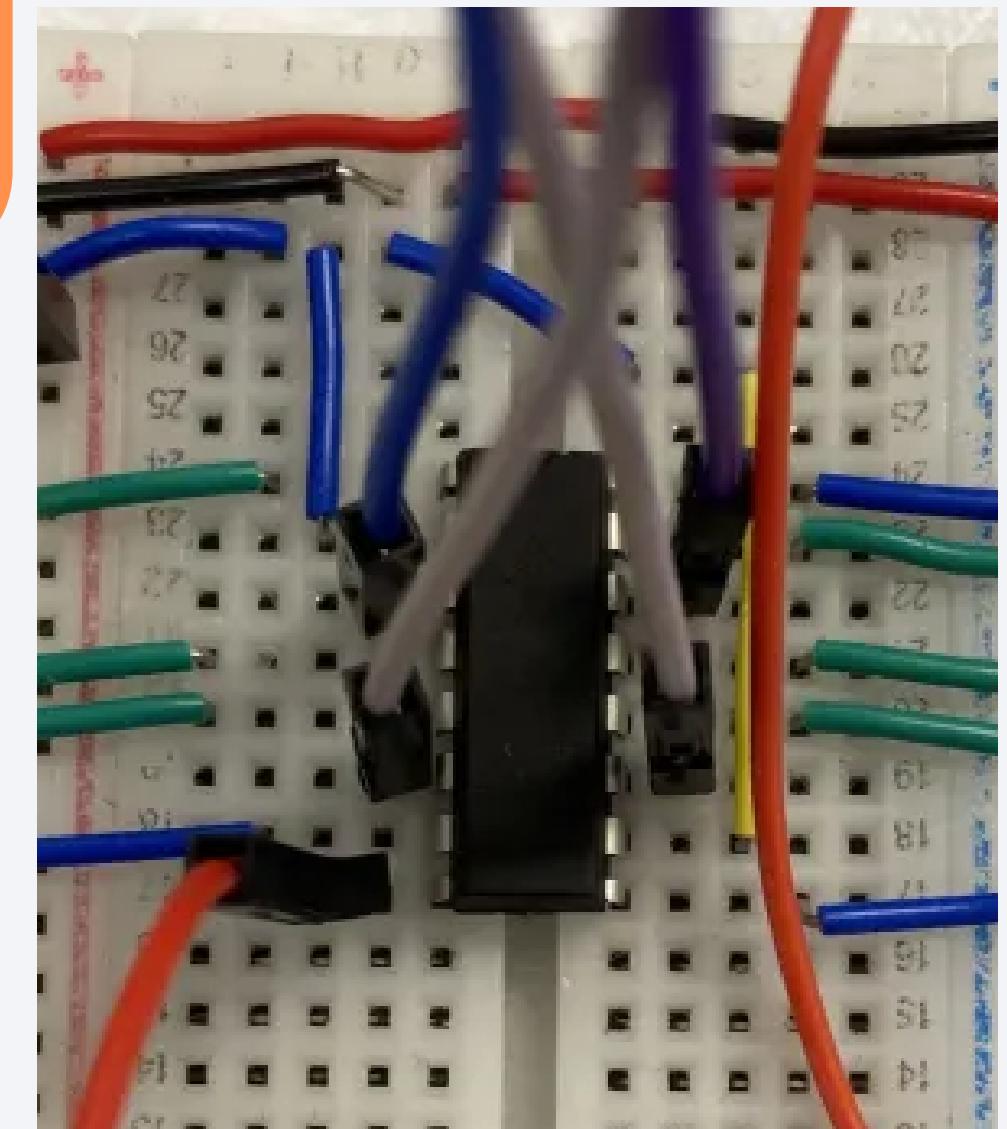
GPIO Output



Always maximize the power



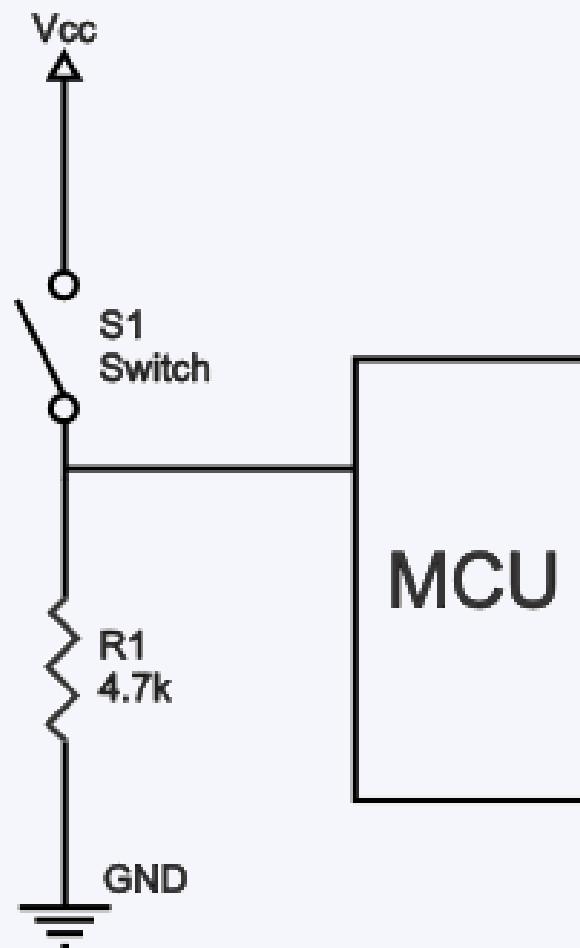
Output Voltage



Manual Mode

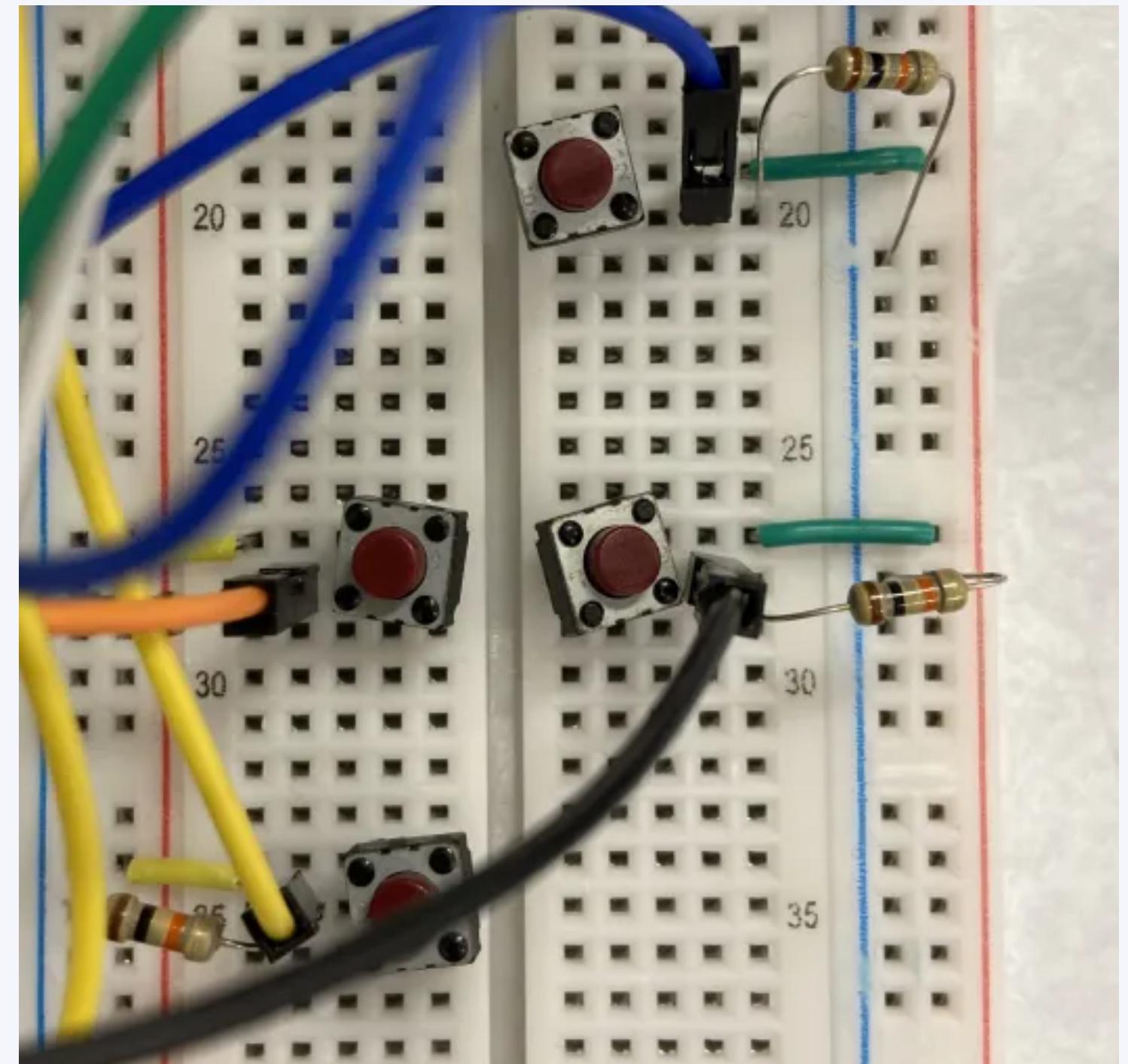
GPIO Input

- Pull-down resistor
- If 1, generate pulse



Polling

- Few devices to check
- Simple



Summary