Tab 1

Personal Projects

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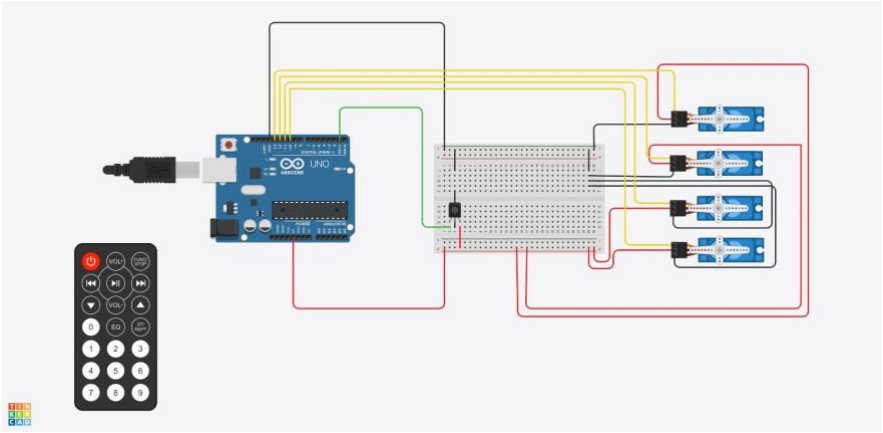
Robotic Arm

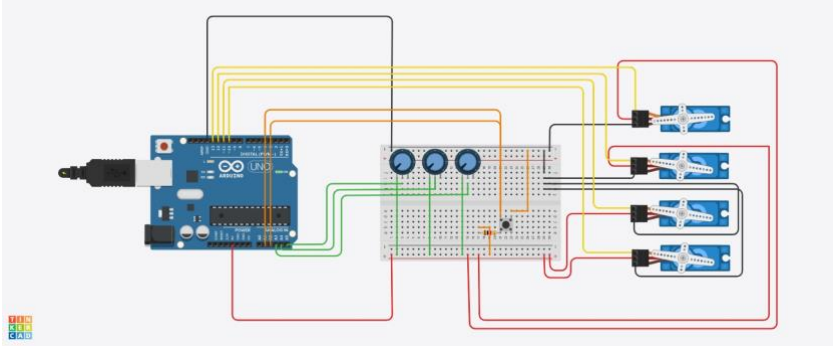
3D Design

Circuit design

Design 1:



Design 2:

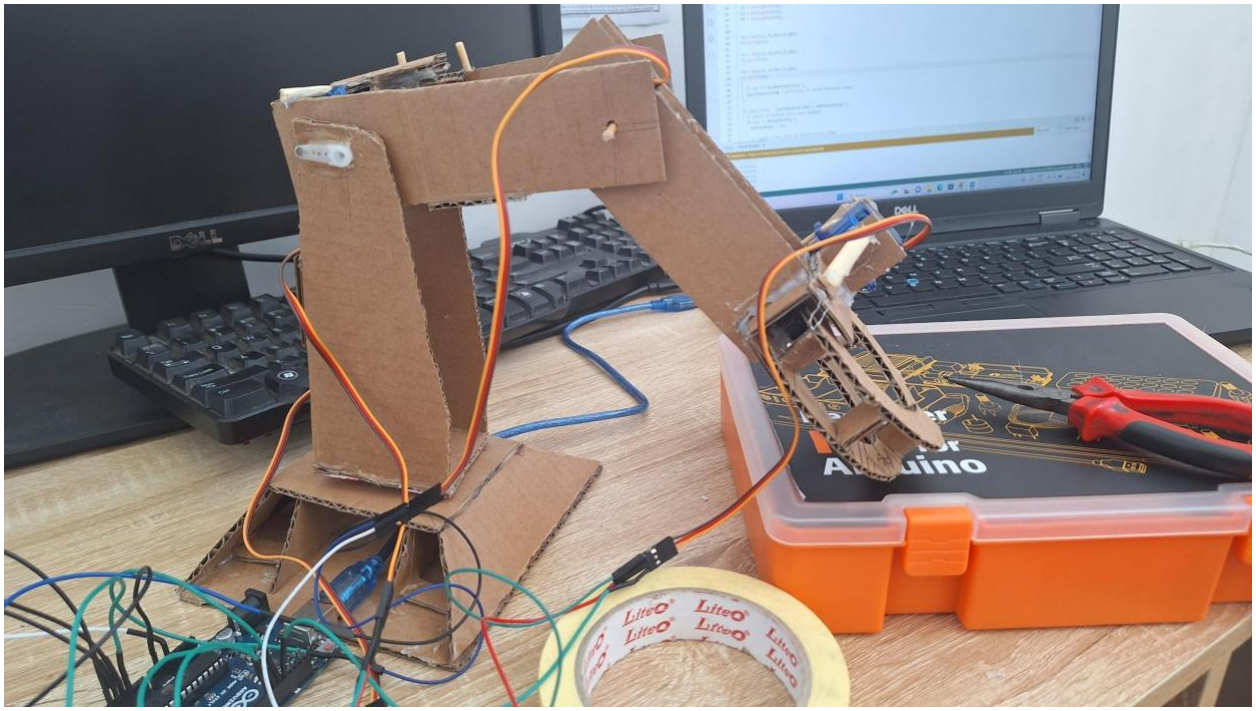


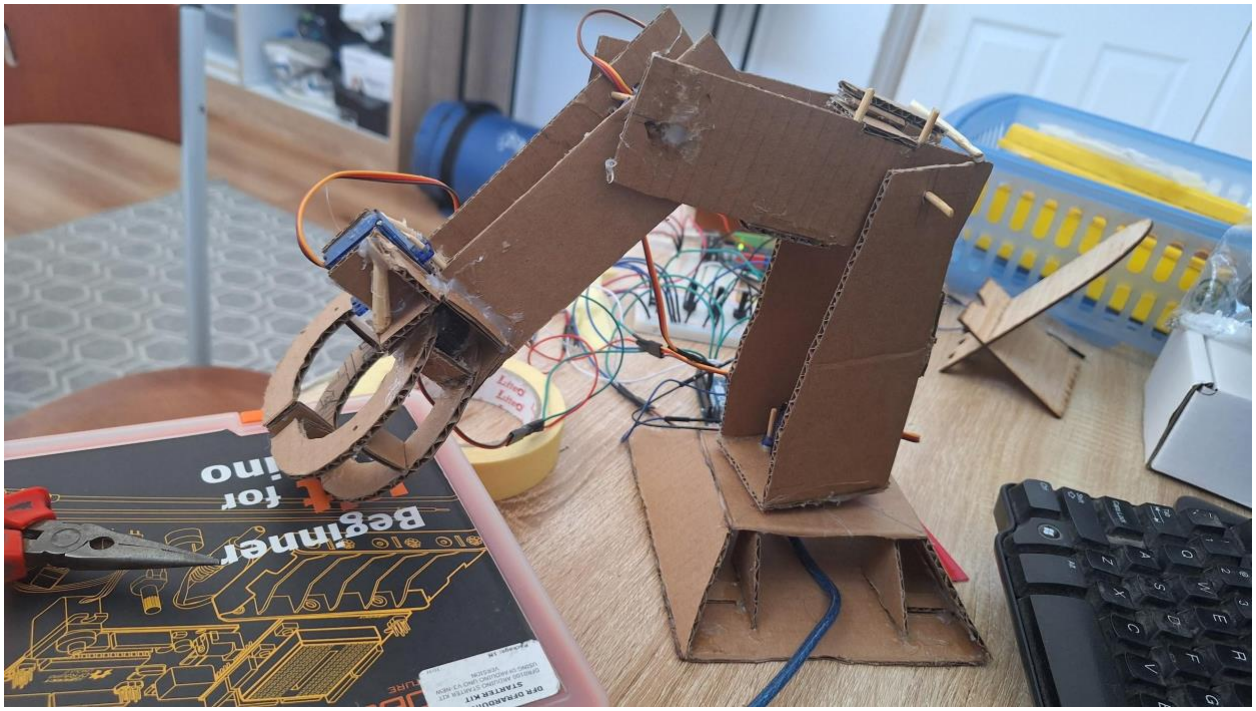
Design 2 code:

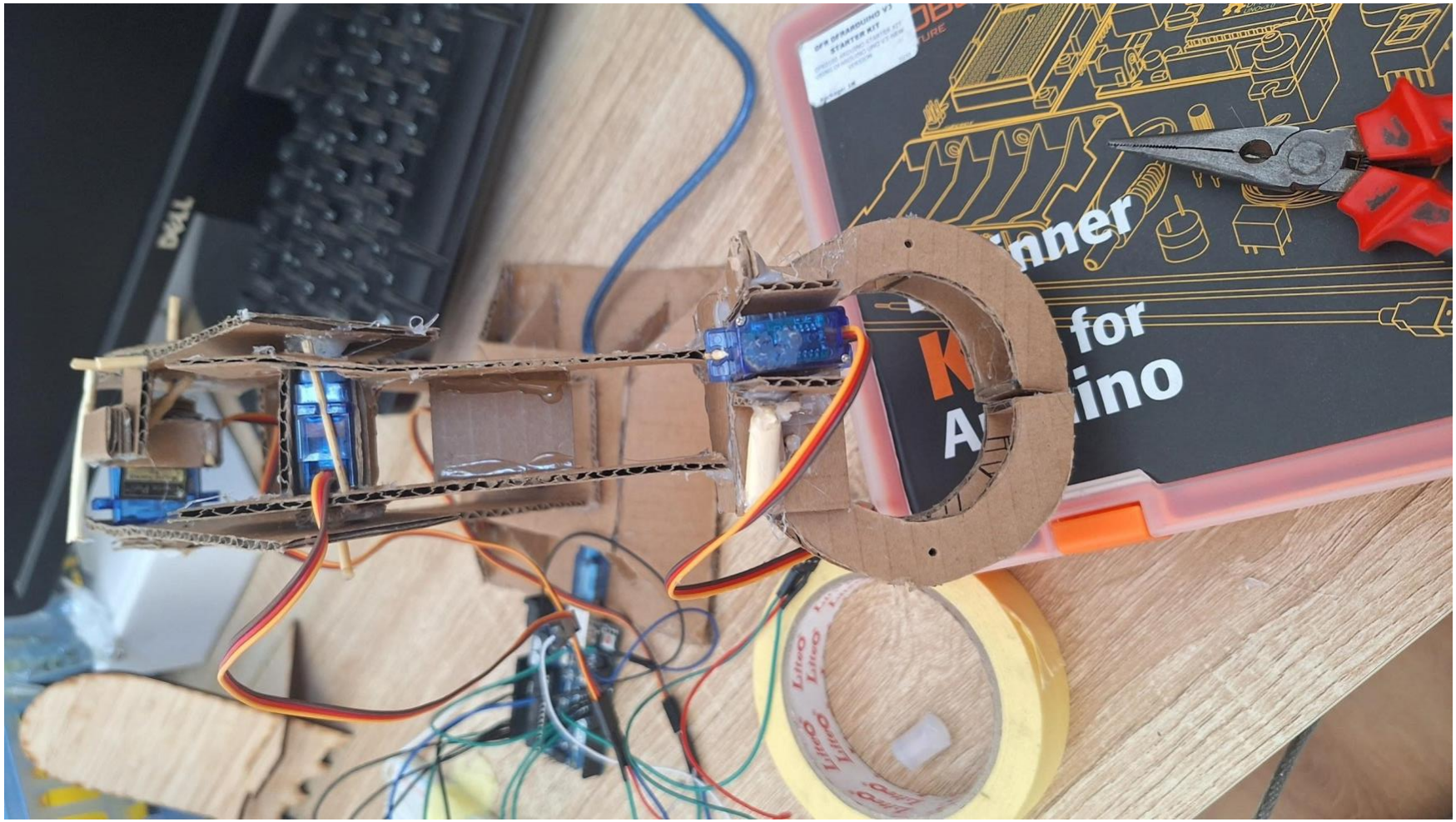
```
// C code
#include <Servo.h> Servo s1, s2, s3, s4; float v1, v2, v3, v4, posv1; int
buttonState = HIGH; // Current state of the button int lastButtonState =
HIGH; // Previous state of the button bool isGripping = false;          //
Tracks claw state (grip/release) unsigned long lastDebounceTime = 0;
// Timestamp for debouncing unsigned long debounceDelay = 50; //
Debounce delay in milliseconds void setup() {
  // put your setup code here, to run once:
  Serial.begin(9600); pinMode(A3,
  INPUT); pinMode(A4, INPUT);
  pinMode(A5, INPUT); pinMode(A2,
  INPUT_PULLUP); pinMode(A1,
  INPUT); pinMode(13, OUTPUT);
  pinMode(12, OUTPUT); pinMode(11,
  OUTPUT); pinMode(10, OUTPUT);

  s1.attach(13);
  s2.attach(12);
  s3.attach(11);
  s4.attach(10);
  s1.write(0);
  s2.write(0);
  s3.write(0);
  s4.write(0);
}


void loop(){
  v1 = digitalRead(A2); posv1 =
  analogRead(A1); posv1 =
  map(posv1,0,1023,0,180); v2 =
  analogRead(A3); v3 =
  analogRead(A4); v4 =
  analogRead(A5);


  v2 = map(v2, 0,1023,0,180);
  s2.write(v2);
  delay(50);

  v3 = map(v3, 0,1023,0,180);
  s3.write(v3); delay(50);
```

```
 v4 = map(v4, 0,1023,0,180);
 s4.write(v4); delay(50);

   if (v1 != lastButtonState) {
    lastDebounceTime = millis(); // Reset debounce timer
 }

 if ((millis() - lastDebounceTime) > debounceDelay) {
   // Check if button state has changed if (v1 !=
   buttonState) {
     buttonState = v1;

     // Toggle state only on button press (LOW)
     if (buttonState == LOW) {
       isGripping = !isGripping; // Toggle grip/release state

       if (isGripping) {
         s1.write(90); // Grip position
         Serial.println("Claw is gripping.");
       } else { s1.write(0); // Release
         position
         Serial.println("Claw is released.");
       }
     }
   }
 }

 lastButtonState = v1; // Save the current state
}
```

Physical implementation


DELL
LiteO


for
Beginner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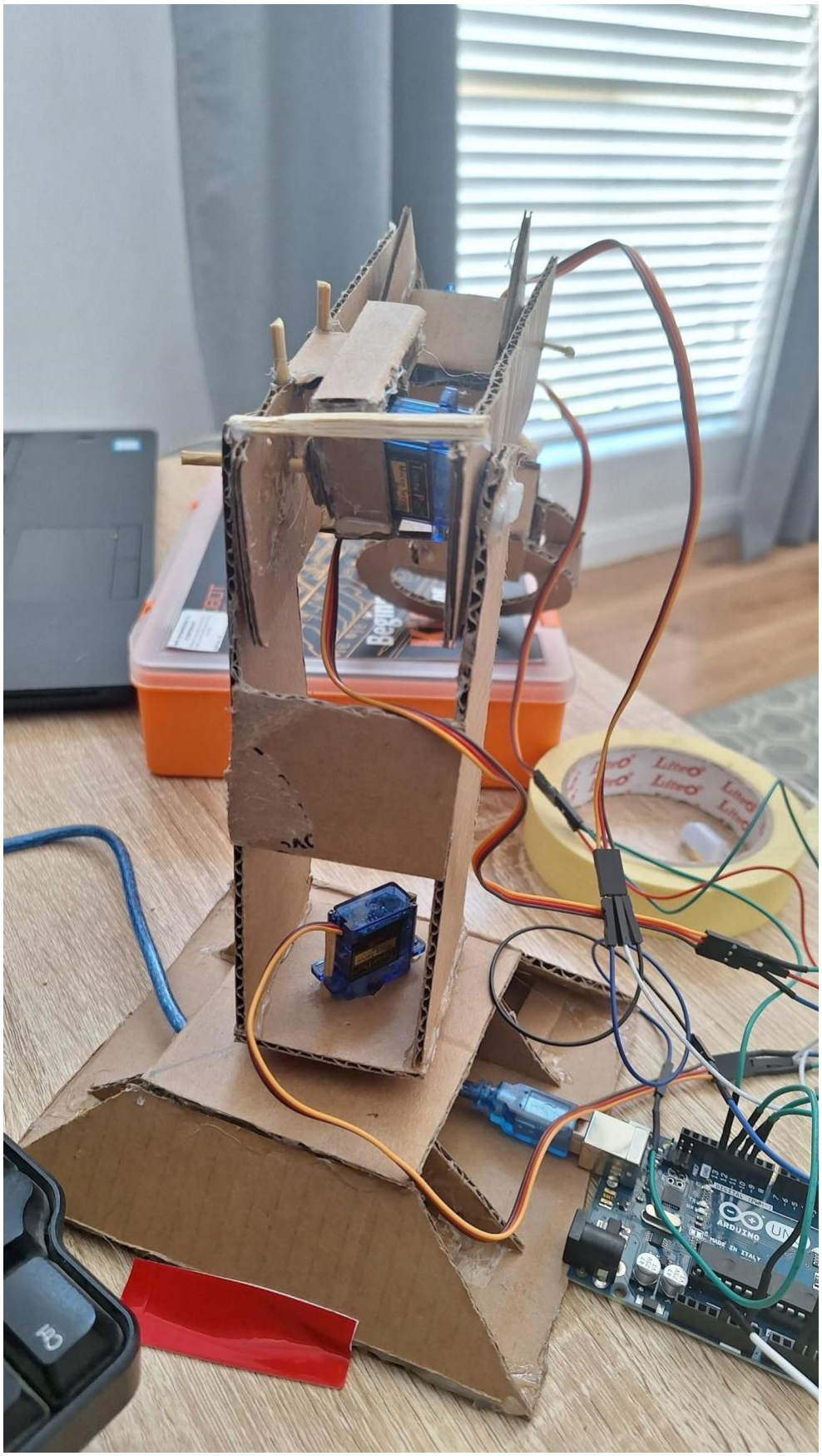
ARDUINO
MADE IN ITALY