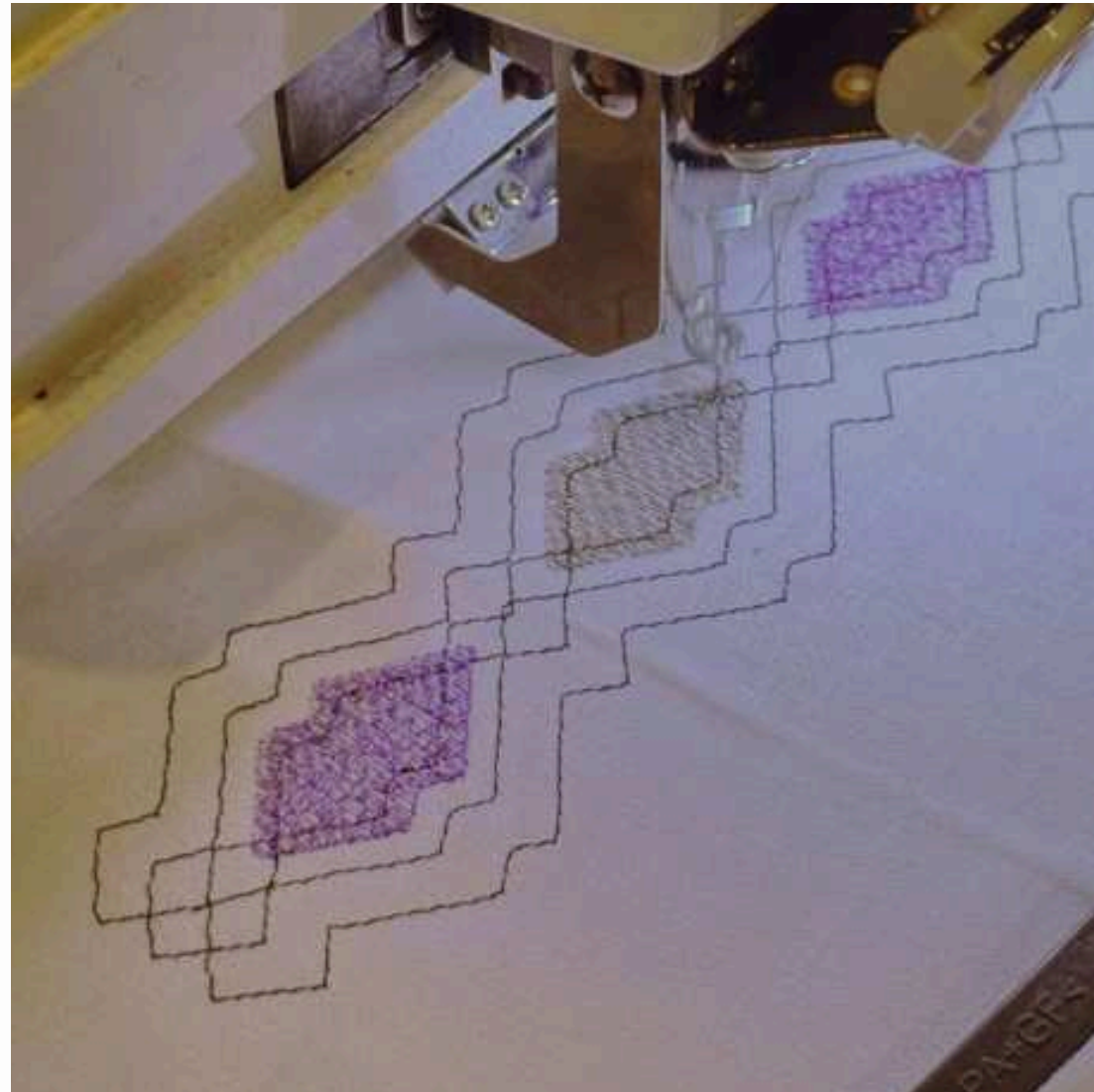




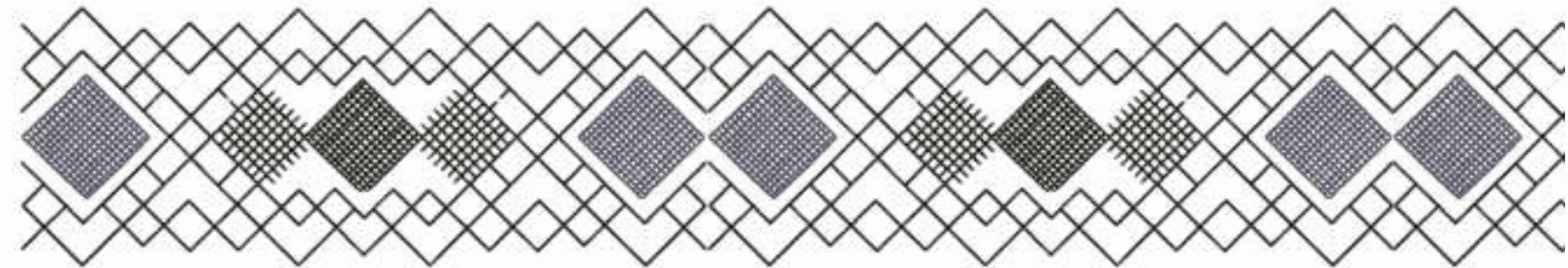
# E - K U B B E H

FABRICADEMY BOOTCAMP 2025



## DESIGNING E-KUBBEH

This design is a special technique from the island of Crete, known for its intricate, hand-crafted embroidery that reflects centuries of local tradition. It is very rare today, as only a few artisans still preserve and practice this heritage method. The technique was historically used to decorate fabrics with symbolic patterns inspired by nature, mythology, and everyday life in Crete.

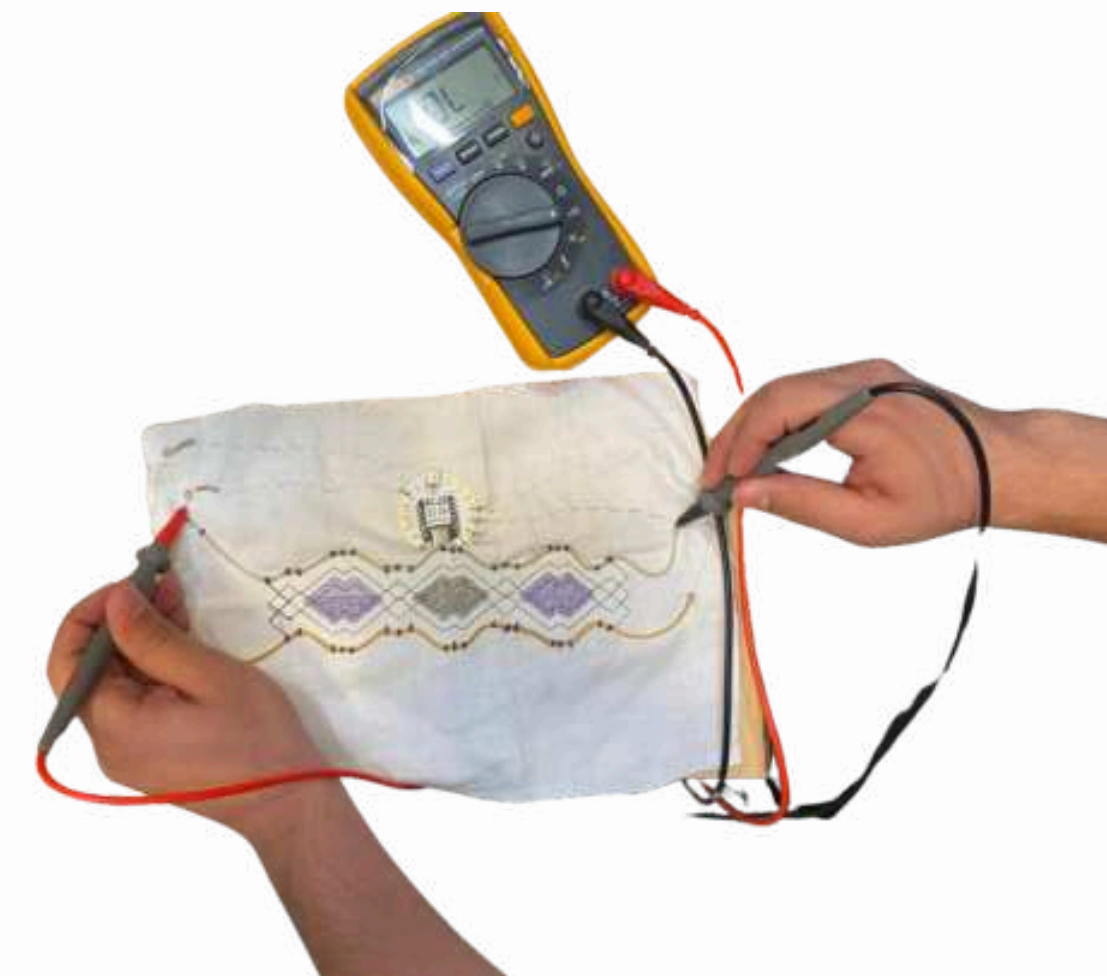
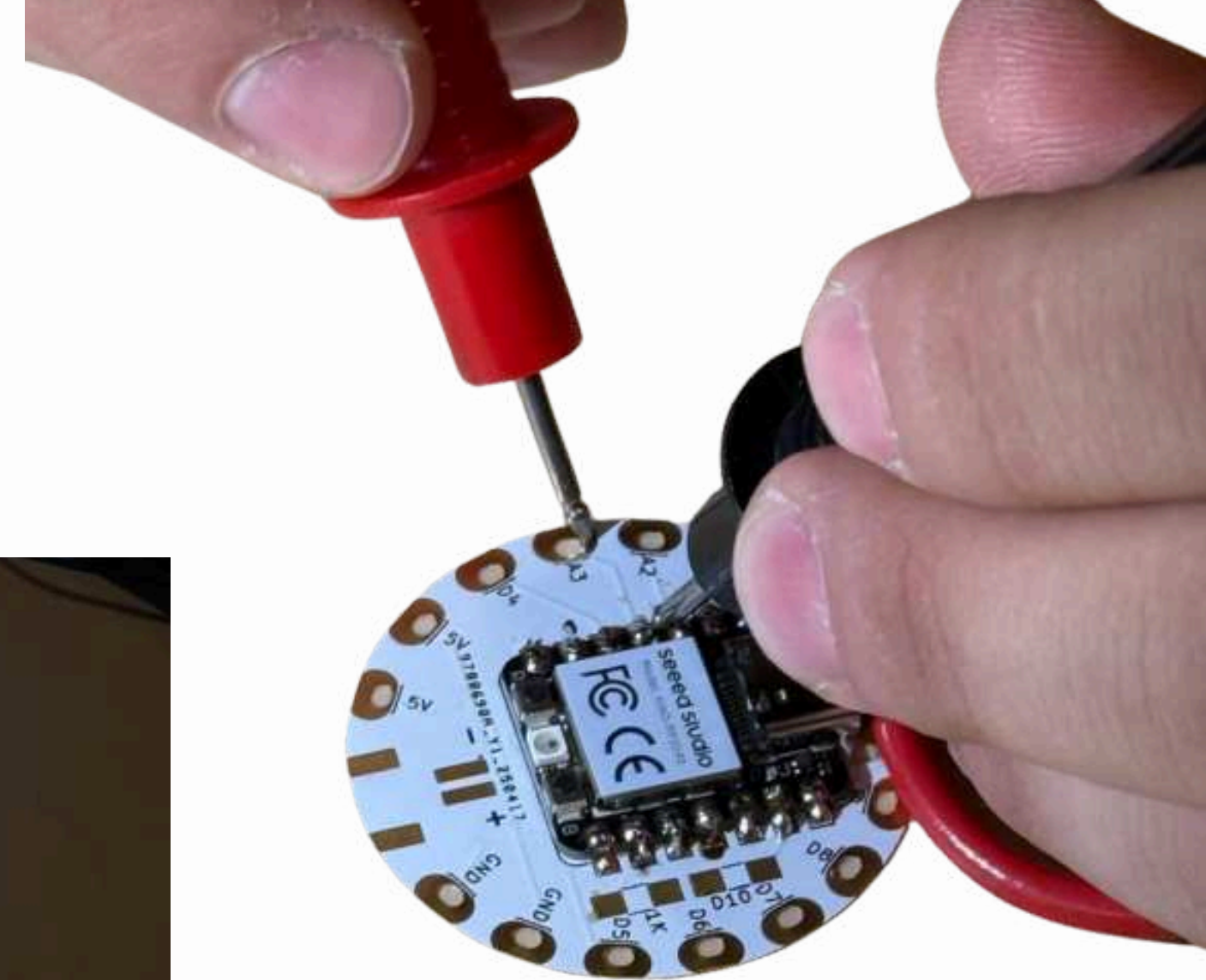
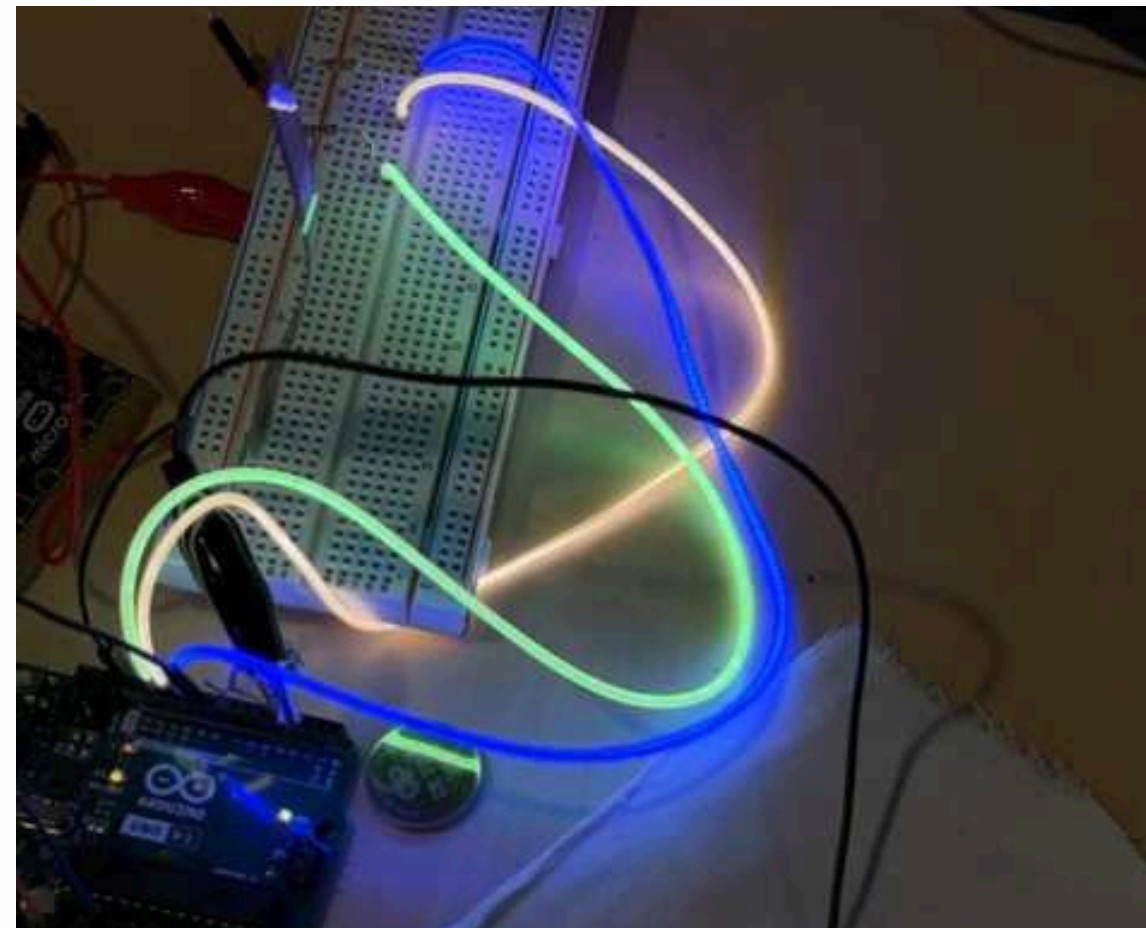




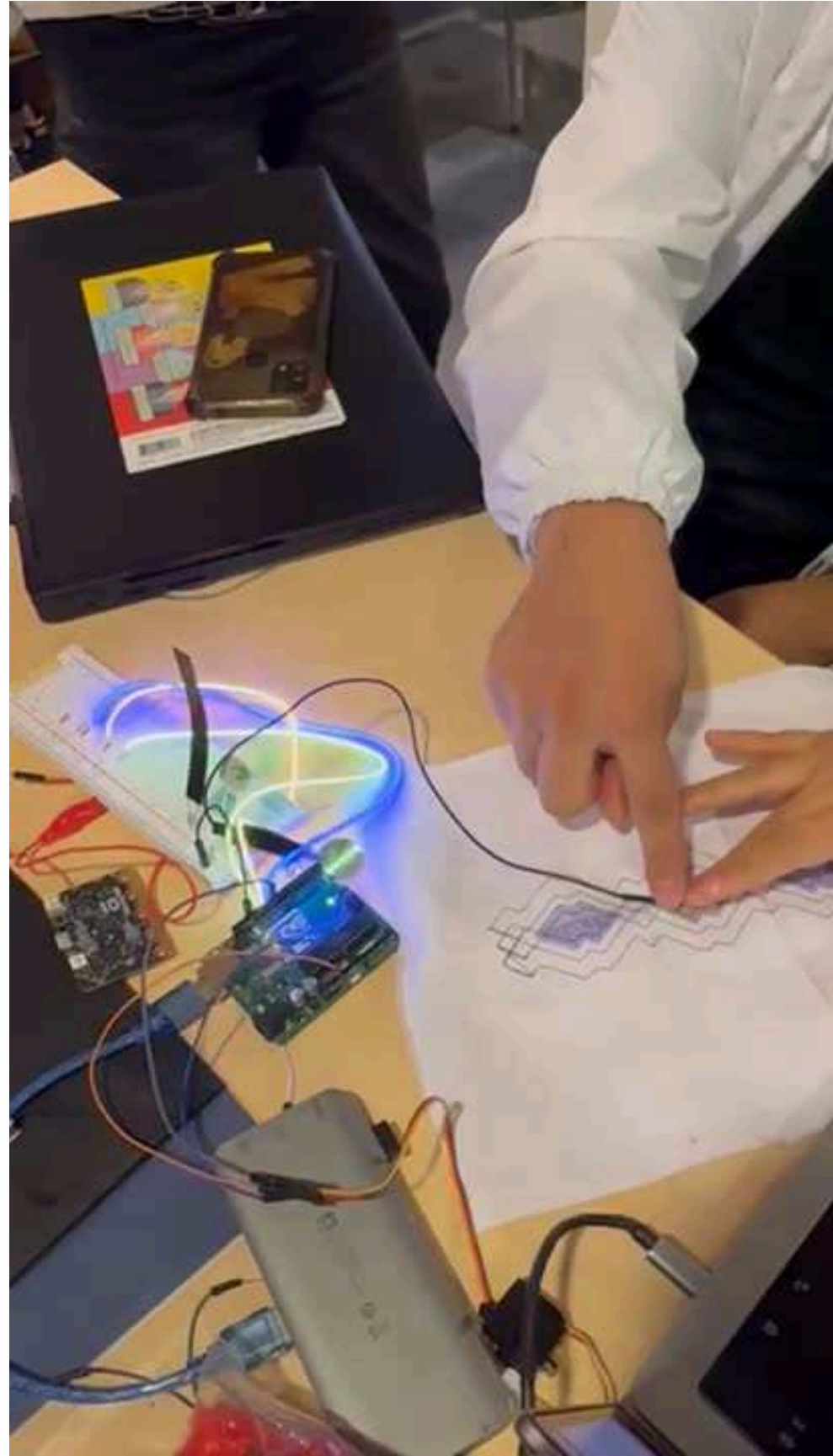
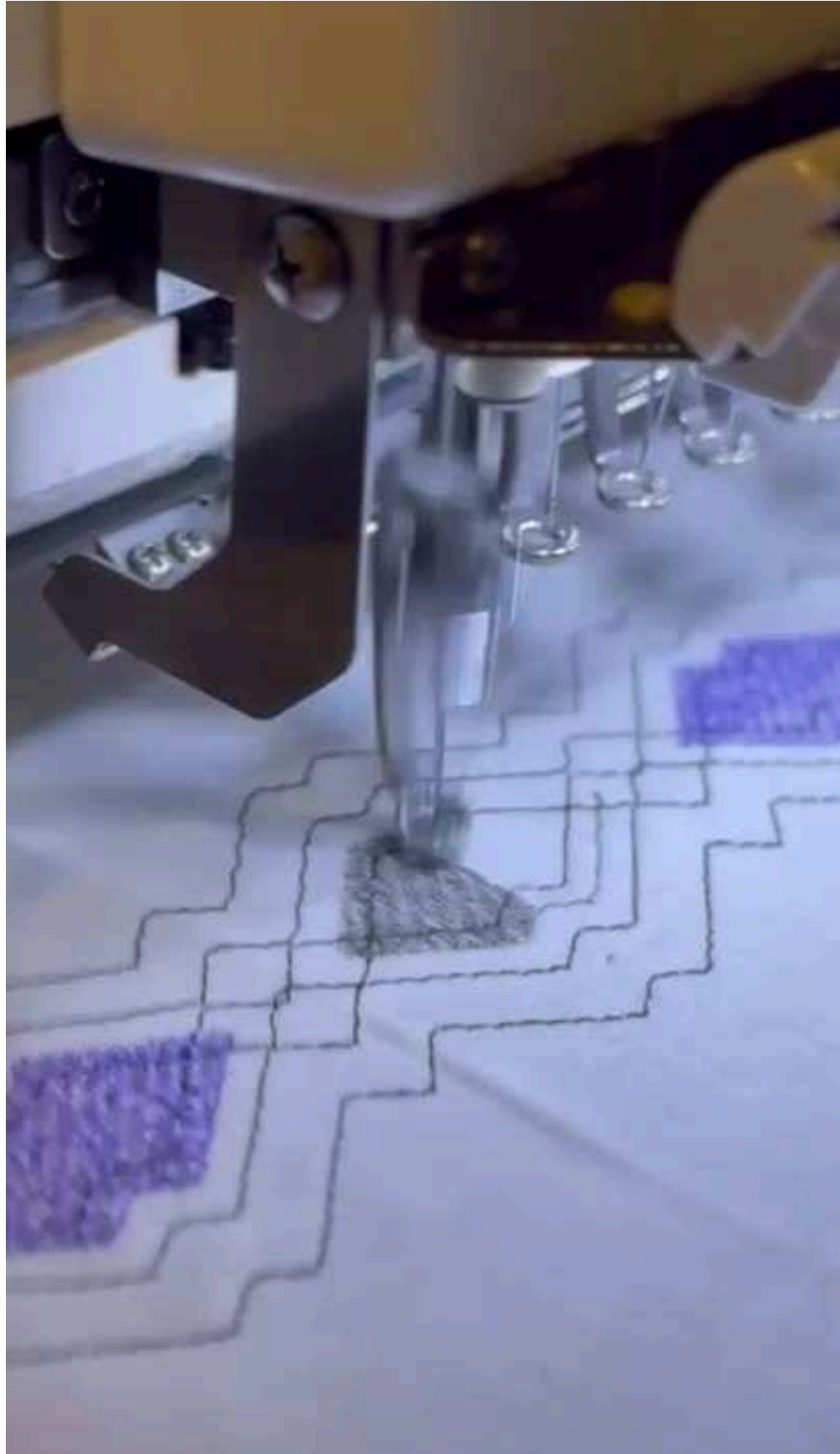
# TESTING

We began by defining inputs and outputs within the system. On the input side, we used two analog channels from the microcontroller. We used these channels as a capacitive sensor that received signals directly from the conductive embroidery embedded in the fabric.

When the textile detected interaction (such as touch) it sent a signal to the microcontroller, which then triggered a response. On the output side, we connected three digital outputs to control LED strips, allowing us to create light-based visual feedback.







# ASSEMBLY

## Components

- Flexible PCB Microcontroller
- Resistors (2x220 Ohm & 1x 10MOhm)
- LED Strip (2x)
- Conductive yarn
- 5v Charger

Hand embroider the circuit with conductive thread to connect the lights to the microcontroller- making sure to connect each LED strip to a resistor - these limit the current and prevent us creating a short circuit. Connect the conductive embroidery to the resistor between the two analog channels.





# CODE

```
1 #include <CapacitiveSensor.h>
2
3 CapacitiveSensor cs_4_2 = CapacitiveSensor(4,2); // 10M resistor between pins 4 & 2, pin 2 is senso:
4
5 const int ledPin01 = 12; // pin that the LED is attached to
6 const int ledPin02 = 11; // pin that the LED is attached to
7 const int ledPin03 = 10; // pin that the LED is attached to
8 const int threshold = 120; // an arbitrary threshold level that's in the range of the analog input
9
10 void setup()
11 {
12     // initialize the LED pin as an output:
13     pinMode(ledPin01, OUTPUT);
14     pinMode(ledPin02, OUTPUT);
15     pinMode(ledPin03, OUTPUT);
16     cs_4_2.set_CS_Autocal_Millis(0xFFFFFFFF); // turn off autocalibrate on channel 1 - just as an example
17     Serial.begin(9600);
18 }
19
20 void loop()
21 {
22
23     long start = millis();
24     long totall = cs_4_2.capacitiveSensor(30);
25
26     if (totall > threshold) {
27         digitalWrite(ledPin01, HIGH);
28         digitalWrite(ledPin02, HIGH);
29         digitalWrite(ledPin03, HIGH);
30     } else {
31         digitalWrite(ledPin01, LOW);
32         digitalWrite(ledPin02, LOW);
33         digitalWrite(ledPin03, LOW);
34     }
35
36     delay(10); // arbitrary delay to limit data to serial port
37 }
```

## Starting Declaration

- We use the capacitive sensor library for the sensing
- Then we declare variables

## Set Up

- Set pin modes
- Initiate capacitive sensor

## Main Loop

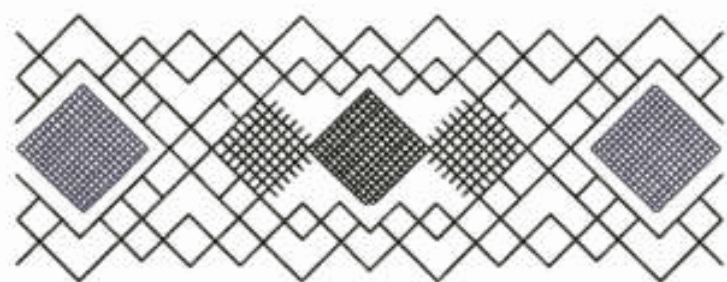
- Read sensor value
- Turn on LED if the sensor value is above the threshold and off if below

# FINAL TOUCHES

Now Creta is being revived through the integration of electronic textiles, combining ancient craftsmanship with modern innovation. This project honors Cretan legacy while embracing the future of wearable technology. Each piece tells a story of culture and connection. Tradition meets transformation in every thread.



# THANK YOU



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