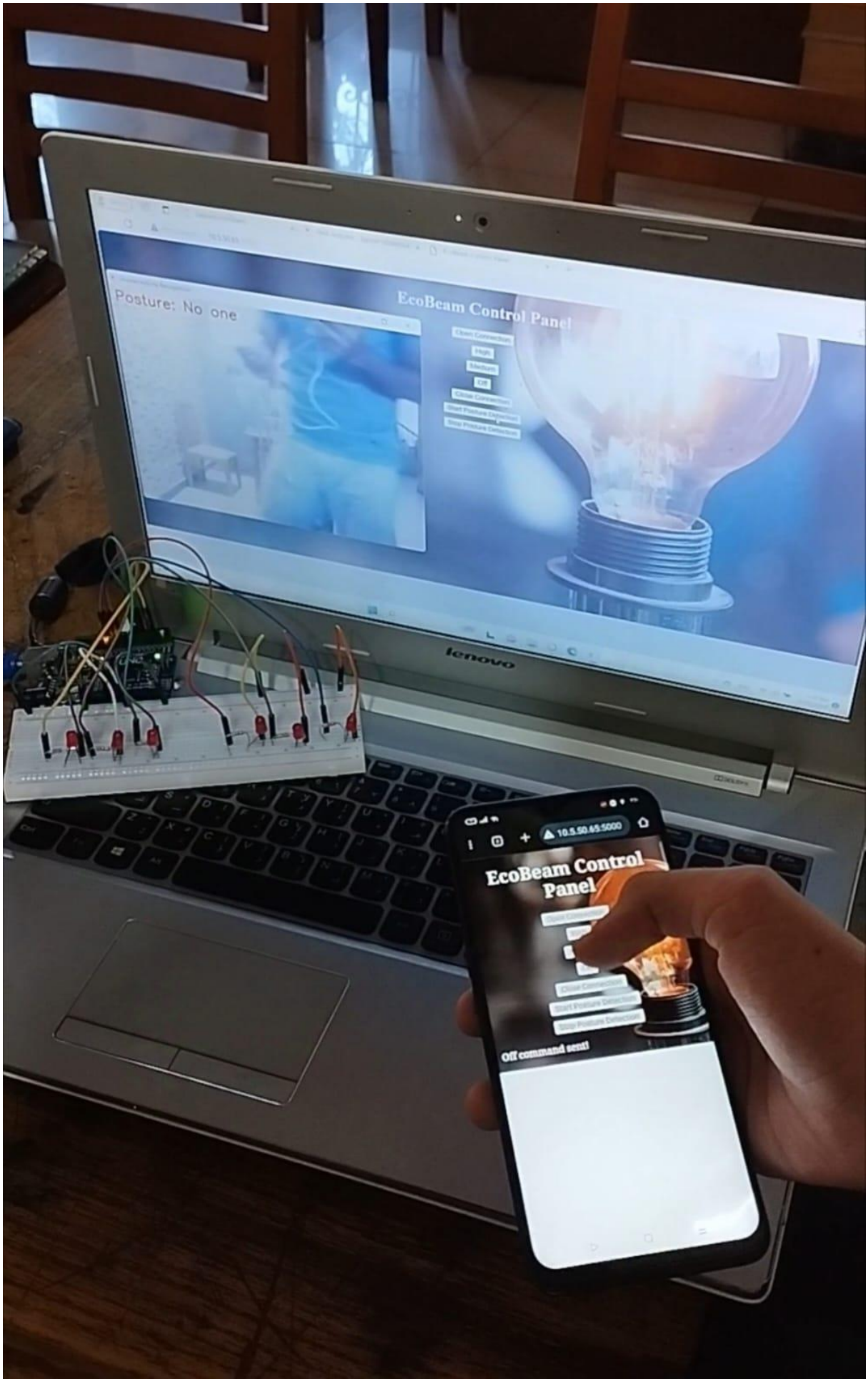
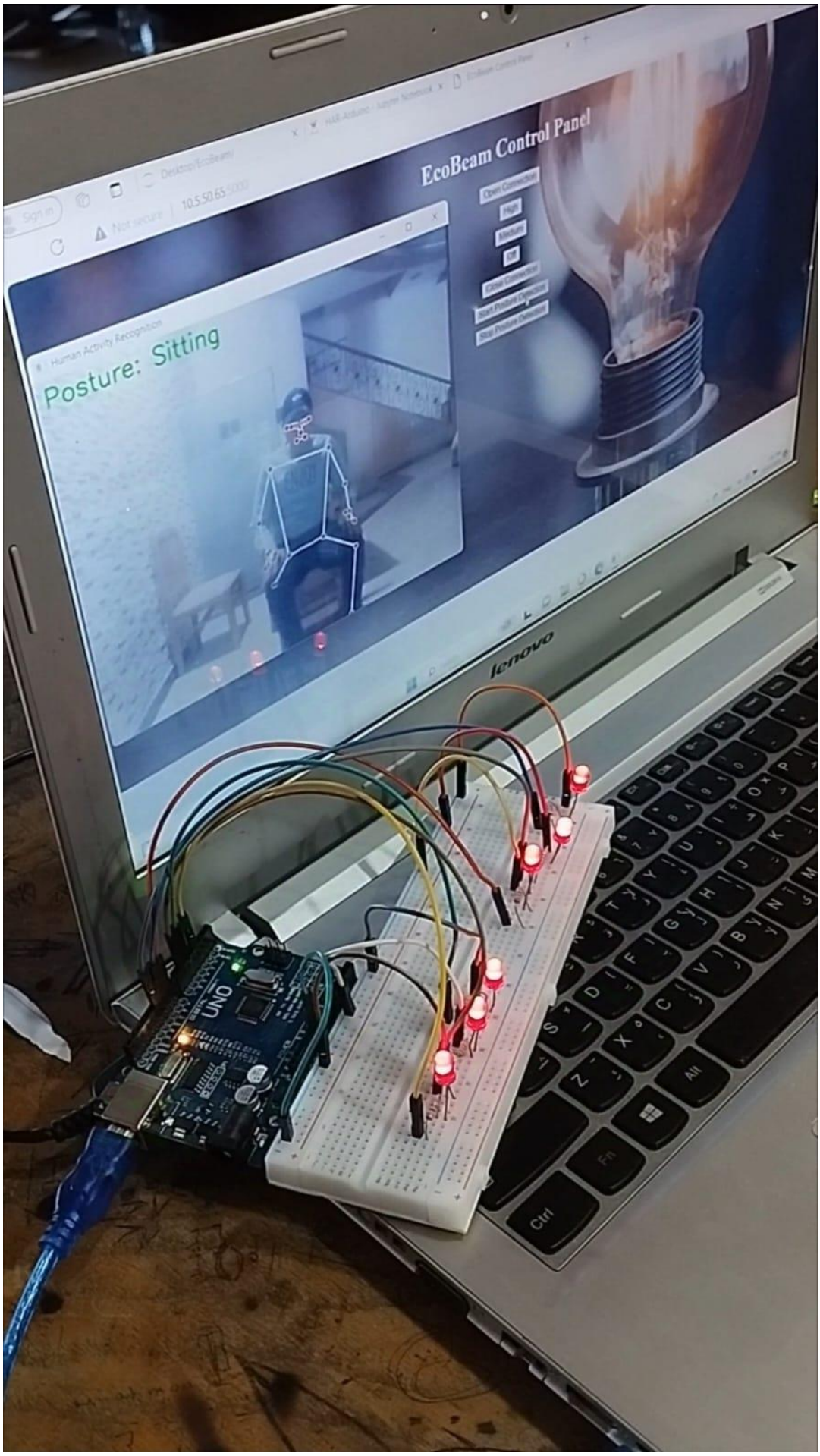

Posture: No one
EcoBeam Control Panel
lenovo
10.5.50.65:5000
EcoBeam Control Panel
Off command sent!


EcoBeam Control Panel
Human Activity Recognition
Posture: Sitting
lenovo
UNO
Ctrl
Fn
Alt

In [1]:
```
!pip install opencv-python mediapipe
```

In [2]:
```
!pip install --upgrade protobuf numpy opencv-python --user
```

In [3]:
```
!pip install msvc-runtime
```

In [4]:
```
!pip uninstall mediapipe
```

In [5]:
```
!pip install pyserial
```

In [1]:
```
import serial
import time
```

In [2]:
```
arduino = serial.Serial('COM7', 9600)
```

In [3]:
```
import cv2
import mediapipe as mp
import numpy as np
```

```
WARNING:tensorflow:From C:\Users\Basel\anaconda3\Lib\site-packages\keras\src\losses.py:2976: The name tf.losses.sparse_softmax_cross_entropy is deprecated. Please use tf.compat.v1.losses.sparse_softmax_cross_entropy instead.
```

In [4]:
```
mp_pose = mp.solutions.pose
pose = mp_pose.Pose()
mp_drawing = mp.solutions.drawing_utils
```

In [5]:
```
def classify_posture(landmarks):

    if not landmarks:
        return 0

    shoulder_y = landmarks[mp_pose.PoseLandmark.LEFT_SHOULDER].y
    hip_y = landmarks[mp_pose.PoseLandmark.LEFT_HIP].y
    ankle_y = landmarks[mp_pose.PoseLandmark.LEFT_ANKLE].y


    if abs(shoulder_y - hip_y) > 0.25 and abs(hip_y - ankle_y) > 0.3:
        return 2  # Standing
    elif abs(shoulder_y - hip_y) > 0.1 and abs(hip_y - ankle_y) < 0.3:
        return 1  # Sitting
    else:
        return 0  # Not standing or sitting


def control_arduino(landmarks):

    if not landmarks:
        return arduino.write(b'0')


    shoulder_y = landmarks[mp_pose.PoseLandmark.LEFT_SHOULDER].y
    hip_y = landmarks[mp_pose.PoseLandmark.LEFT_HIP].y
    ankle_y = landmarks[mp_pose.PoseLandmark.LEFT_ANKLE].y


    if abs(shoulder_y - hip_y) > 0.25 and abs(hip_y - ankle_y) > 0.3:
        return arduino.write(b'2')  # Standing
    elif abs(shoulder_y - hip_y) > 0.1 and abs(hip_y - ankle_y) < 0.3:
        return  arduino.write(b'1')  # Sitting
    else:
        return arduino.write(b'0')


cap = cv2.VideoCapture(0)
print("Starting video capture. Press 'q' to quit.")

while cap.isOpened():
    ret, frame = cap.read()
    if not ret:
        break


    image = cv2.cvtColor(frame, cv2.COLOR_BGR2RGB)
    results = pose.process(image)


    if results.pose_landmarks:
        landmarks = results.pose_landmarks.landmark


        posture = classify_posture(landmarks)
        control_arduino(landmarks)
```

```
        mp_drawing.draw_landmarks(frame, results.pose_landmarks, mp_pose.POS


        posture_text = {0: 'No one', 1: 'Sitting', 2: 'Standing'}
        cv2.putText(frame, f'Posture: {posture_text[posture]}',
                    (10, 30), cv2.FONT_HERSHEY_SIMPLEX, 1, (0, 255, 0), 2, (
    else:
        arduino.write(b'0')
        cv2.putText(frame, 'Posture: No one',
                    (10, 30), cv2.FONT_HERSHEY_SIMPLEX, 1, (0, 0, 255), 2, (


    cv2.imshow('Human Activity Recognition', frame)

    if cv2.waitKey(10) & 0xFF == ord('q'):
        break
```

```
Starting video capture. Press 'q' to quit.
```

In [ ]:

In [ ]:

In [ ]:

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In [ ]:

In [ ]:

In [ ]:


2024

This translation was completed by me and is submitted as part of my scholarship application documents.

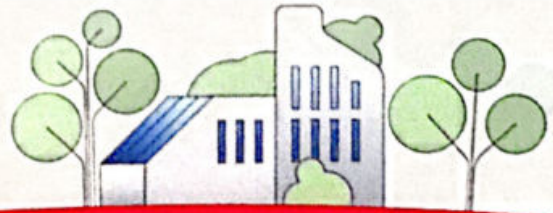
Certificate of Appreciation for the Trainer

Innovative Technician Competition

BASEL MOKHTAR ELSAYED MOHAMED

Thank you for everything you provided in support of your team and for guiding them throughout the stages of the "Innovative Technician" competition. Your presence alongside them and your encouragement had a clear impact on supporting their creativity and developing their ideas.

We are proud of your efforts and your commitment to the success of the team.
Your team achieved accomplishments worthy of pride thanks to your guidance and continuous encouragement.



We are confident that you still have much more to offer to future generations,
and we believe that your success will continue.

With our best wishes for continued success.

Innovative Technician Competition


USAID
من الشعب الأمريكي
BORG AL ARAB INNOVATION CLUSTER
ابدأ
فني مبتكر
شهادة تقدير للمدرب
مسابقة فني مبتكر
باسل مختار السيد محمد
شكرا على كل اللي قدمته علشان تدعم فريقك وتوجهه خلال مراحل مسابقة "فني مبتكر". وجودك جنبهم وتشجيعك ليهم كان ليه تأثير واضح على إبداعهم وتطوير أفكارهم.
فخورين بتعبك وحرصك على نجاح الفريق، فريقك حقق إنجازات تستحق الفخر، وده بفضل توجيهاتك وتشجيعك المستمر.
متأكدين إن لسه عندك كتير تقدمه للأجيال اللي جاية،
وواثقين إن نجاحك هيكون مستمر!
مع أطيب تمنياتنا بالتوفيق،
مسابقة فني مبتكر

Innovative Technician Competition is launching its fifth edition, focused on the green economy, where the platform serves as a competitive space through which entrepreneurs and innovators race to design innovative solutions that enhance economic development in sustainable and environmentally friendly ways. The competition supports innovators in developing projects to solve problems and challenges of the green economy and achieve a positive impact on the environment.

فني مبتكر في نسخته الخامسة قائم حول الاقتصاد الأخضر. حيث تمثل منصة يتسابق من خلالها رواد الأعمال والمبتكرين لتقديم حلول مبتكرة تعزز التنمية الاقتصادية بطرق مستدامة وصديقة للبيئة. وتقوم المسابقة على مساعدة المبتكرين في تطوير مشاريعهم لحل مشكلات وتحديات الاقتصاد الأخضر وتحقيق تأثير إيجابي على البيئة