

Days 4/9, 5/9

## Computer Vision Section – Amir, Logy

### Accomplishments:

AI model that recognizes faces, successfully categorizes them into known and unknown by going through pictures of all known persons' faces in a database

### Problems encountered:

None so far

### Steps:

1. Training a model that recognizes faces using mainly face\_recognition library, drawing frames around the face notifying the webcam's user whether they've been recognized or not
2. Writing a function that iterates over all pictures saved to a database to load images of known persons for the model to work with
3. Writing a function to extract names of persons from image's path for general ease (rather than turning to hard coding)
4. Work is readily uploaded to GitHub for ease of communication with teammates

## Micro-controllers Section: - Badr

Looked into the specs and datasheet of the ATmega8A, found out that:

- 1- It's a lower profile chip compared to the ATmega328P, with smaller memory and storage size. So, I have to keep the program size/memory consumption in consideration.
- 2- It has 3 PWM channels/pins and 6/8 ADC channels, depending on the package.
- 3- Has the same pinout as the ATmega328P on the Arduino Uno, so simulation on Tinkercad was somewhat possible and easy.

Learned how to work with the new stuff first, the Photoresistor, the NTC Sensor and the 4\*4 Keypad, understood how they work and how to code for them.

Looked for real parts to be able to confirm the compatibility of my code.

Coded and simulated most -if not all- of the functions of the system. The communication between the Atmega and the Control Interface on the laptop can't be tested virtually, so I used the Serial Monitor as input/output, such functions that are completed are as follow:

- If the door is opened (using password on keypad or serial input): Start the system functions and unlock the house (PIR won't try to detect if an intruder is present if the door is opened).
- Measure surrounding lighting level with LDR (control light system level) and if the reading from the LDR is low, meaning low light in the environment, turn the LED on, else, turn it off.
- Measure temperature with a temperature sensor and depending on that reading the result is shown on RGB LED as follows:
  - \* **Red**:  $T > 30^{\circ}\text{C}$
  - \* **Green**:  $30^{\circ}\text{C} > T > 20^{\circ}\text{C}$
  - \* **Blue**:  $T < 20^{\circ}\text{C}$
- The temperature sensor reading controls the speed of the motor with a fan extension with the aid of an L293D chip, it has 3 modes, if  $T < 20^{\circ}\text{C}$  then the fan is off, between  $20^{\circ}\text{C}$  and  $30^{\circ}\text{C}$  the fan is dynamic between 2000RPM and 3000RPM, and  $T > 30^{\circ}\text{C}$  the fan speed is constant at 3500RPM.
- Use a PIR sensor to detect if there is anyone inside the home if the door is locked and print on the serial monitor that there's an intruder (only if the house is locked).
  - If a WRONG password is entered:
    - Buzzer rings for 500ms.
    - Show warning messages on the serial monitor.
- Ability to lock the system again via a serial monitor input, to shutdown the system (fan, lights and sensors) and the PIR sensor will begin working.

## Problems:

- 1- Wrote the code for the NTC temp sensor but couldn't test it as the temp sensor on Tinkercad is different, so right now, I use hardcoded values to simulate the values of the pin of the NTC temp sensor. It has no solution right now, only we wait til we build the project and see if it correctly works.
- 2- Instead of using 3 pins of the ATmega for the motor driver, I only used the Enable pin on the driver to control the speed (I can set it to 0 if I want the fan to stop), and the Input1-Input2 pins of the driver are always GND-5V, so the fan always spins in 1 direction (makes sense anyways).
- 3- Now, I'm going to optimize the code to be more memory efficient.

## Hardware Section:

Work only started 6/9.

Links:

[AmirKaseb/Mini-Smart-Home-System: This Repo demonstrates our journey \( Team 11 \) for Mind Cloud Final Project \(github.com\)](#)

<https://www.tinkercad.com/things/emIDLEaHkLq-mindcloud-megaproject-microcontroller-team-11>