

# CAREER PORTFOLIO<sup>○</sup>

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BS in Computer Engineering  
2025

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Computer  
Engineer

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# ABOUT ME

I am a computer engineering student undergraduate in my 4th year focusing on hardware and software development. Currently learning about embedded systems, digital design, and machine learning. I have hands-on experience with using PIC, Arduino, and ESP32 microcontrollers for both as coursework projects and as personal projects. The languages I have tackled for these microcontrollers are MikroC, Arduino, and Python.

I enjoy implementing new innovative methods into my projects as well as follow the fundamental core of embedded systems. This portfolio showcases selected works from my academic journey and personal experiments.

# SKILLS

Programming Languages	<ul style="list-style-type: none"><li>• C</li><li>• C++</li><li>• Python</li></ul>
Microcontrollers	<ul style="list-style-type: none"><li>• Arduino</li><li>• ESP Series</li><li>• PIC16F877A</li></ul>
Communication Protocols	<ul style="list-style-type: none"><li>• UART</li></ul>
Tools & Software	<ul style="list-style-type: none"><li>• Arduino IDE</li><li>• MPLAB</li><li>• VS Code</li><li>• MikroC</li><li>• TinkerCAD</li><li>• KiCAD</li></ul>
Other Technical Skills	<ul style="list-style-type: none"><li>• Linux Terminal</li><li>• Basic Soldering</li><li>• OpenCV</li></ul>

# PROJECTS

## FACE TRACKING WITH ARDUINO & OPENCV (Personal Project)

This project tracks the face of the user using a Python OpenCV program that sends data to the Arduino IDE to be sent to the servo SG90 to reflect the movement of the user in real time. This project was made as a side project while having a course for Computer Vision. This project could be expanded for motion tracking designs with actuators reacting to certain situations of what the camera could detect.

Materials:

1. ESP328266 D1 R1
2. Servo Motor 9G
3. LED
4. 220 Ohm Resistor

Image of Project



*Figure 1. Showcase face tracking with servo motor following user face movement*

Github Code: <https://github.com/PJ-Caleon/Face-Tracker>

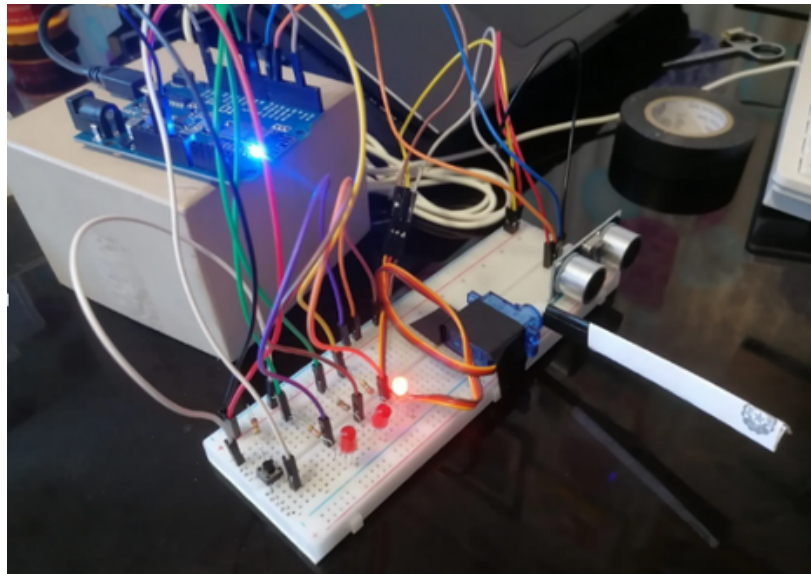
## CAR PARKING COUNTER (Personal Project)

The project is a prototype for a parking gate that uses an ultrasonic sensor to detect cars. A servo motor controls the gate, allowing a maximum of three cars to enter. If a fourth car tries to enter, the gate remains closed. Exiting cars can press a button to open the gate. LED indicators display the current car count

### Materials:

1. ESP8266 D1 R1
2. Ultrasonic Sensor
3. Servo Motor 9G
4. LED
5. 220 Ohm Resistor
6. Push Button

### Image of Project



*Figure 2. Hardware Design*

GitHub Code: <https://github.com/PJ-Caleon/Parking-Counter>

## DOWN COUNTER WITH 7-SEGMENT DISPLAY (Academic Project)

This is an individual academic project where the task is to create a PIC16F877A counter with a keypad that initially sets the counter's value. This is then reflected on the 7 segment. A start button is added to start the countdown and a pause button is added to pause the count. There are 3 LEDs that display the status of the counter. Green LED on indicates the count down. A red LED indicates the pause. Lastly a blue LED indicates the timer has reached 0.

Materials:

1. MikroC PRO for PIC
2. Proteus
3. Components Used
  - a. PIC16F877A
  - b. Crystal
  - c. Capacitor
  - d. LED
  - e. 4x3 Keypad
  - f. Resistor
  - g. 74LS48
  - h. 7 Segment LCD
  - i. Push Button

Image of Project

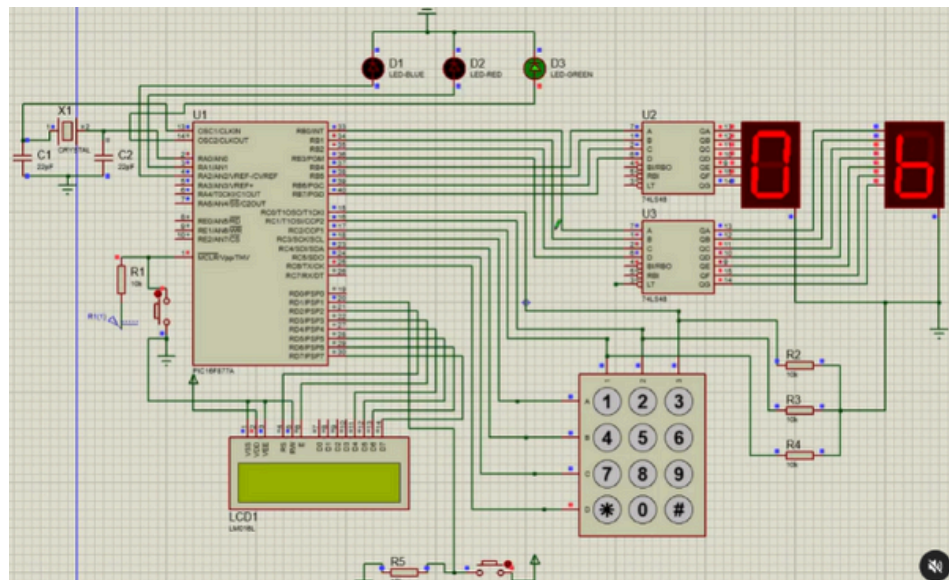


Figure 3. Displays the Schematic of the Circuit

Github Code: <https://github.com/PJ-Caleon/DOWN-COUNTER-WITH-7-SEGMENT-DISPLAY>

## SMART IOT TRASH BIN (Academic Project)

This is a group based project and the main goal of this project is to develop a smart IoT trash bin where it has 3 functions. The lid will automatically open when the user places their hand near the ultrasonic sensor. The second function is for another ultrasonic sensor to detect the level of trash in the bin and be displayed on a LCD that will inform the user how full the trash is, in addition that if the trash is full, a buzzer will be triggered. Last function is to send the trash bin level data to an HTML server for the purpose of alerting the user at a remote location.

My role and contribution to this project is that I designed the schematic and built the first 2 functions of this project while I assisted with the IoT function along with my other group members.

Materials:

1. Ultrasonic Sensor
2. Servo Motor
3. Buzzer
4. LCD
5. Arduino
6. ESP8266 Wifi Module

Images of Project

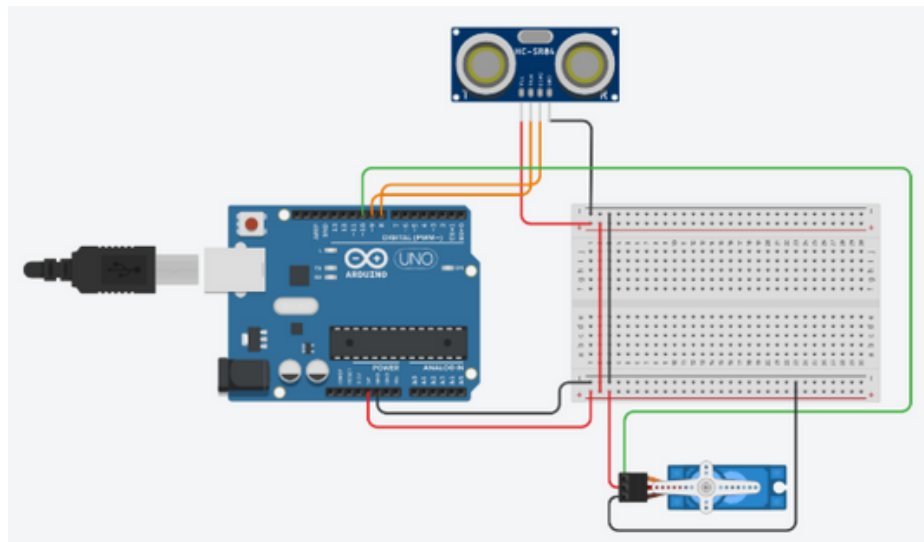


Figure 4. Schematic Figure of Auto open and close lid



## SMART IOT TRASH BIN (Academic Project)

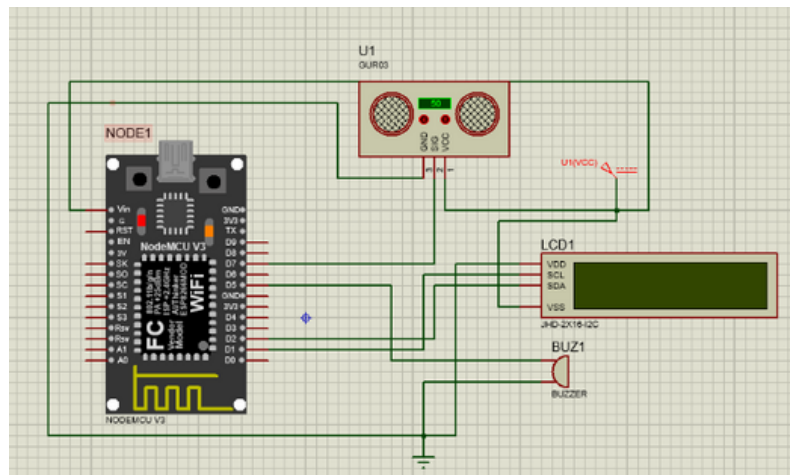


Figure 4.1. Schematic Figure of Trash Bin Level Detection

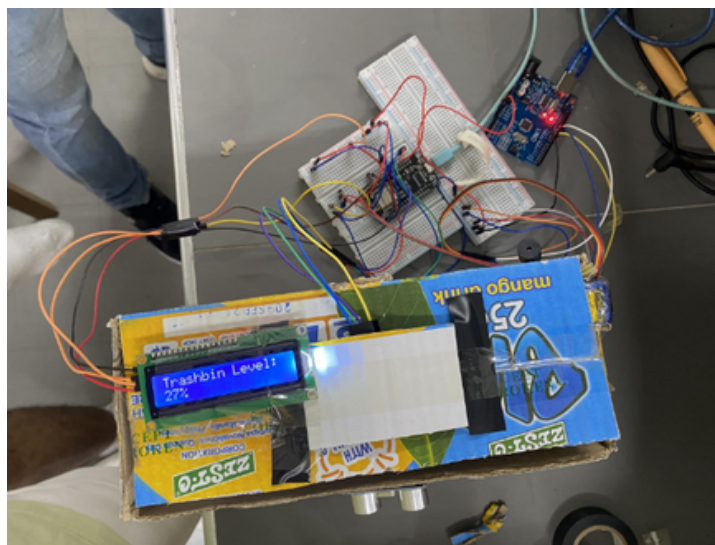


Figure 4.2. Top View of Circuit Prototype



Figure 4.3. Front View of Circuit Prototype

## SMART IOT TRASH BIN (Academic Project)



*Figure 4.4. Display of Trash bin level to HTML Local Host Website*

Complete Documentation: [docs.google.com/document/d/1MStFatoF5YpB31-lyfhxiu71tqpQmBo4n1j85b\\_WecY/edit?usp=sharing](https://docs.google.com/document/d/1MStFatoF5YpB31-lyfhxiu71tqpQmBo4n1j85b_WecY/edit?usp=sharing)

# THESIS PROJECT

## **Development of Touch and Motion Based Glove Controllers with Applications for 3D Media Creation in Virtual Reality (Academic Project)**

This proposal describes the design and development of glove controllers for use in 3D media creation software within a Virtual Reality workspace such as 3D modeling and visualizations. The inputs from the sensors will be processed through a host computer's companion application that will interface with the chosen 3D media creation software, Blender, and the Blender Extension Freebird XR, for integration with Virtual Reality. The controllers allow for 3D media creation to take place in a 3D plane input environment as opposed to 2D plane inputs such as keyboard and mouse or drawing tablets, which have limitations in scale, applications, and efficiency in a VR setting. The sensors for input are capacitive touch sensors, flex sensors, and a gyroscope-accelerometer sensor, which are to be integrated with ESP32 microcontrollers to process human finger and hand movement and translate the movements to remote digital inputs from a distance using the wireless Bluetooth module of the microcontrollers.

My main role and contribution to this project is designing the UI/UX design of the input monitor using Python. The function is when the glove controller makes an input, this data will be sent to the Arduino IDE via bluetooth transmission and this data will be sent to the main Python script. I am tasked with collecting the data from the main script and to be reflected to a UI display on the computer monitor. I also assist with the backend of transmitting the data packs along with my other members. The project is still in development as the data pack has not been translated to the Blender platform for 3D creation.

## Image of Project

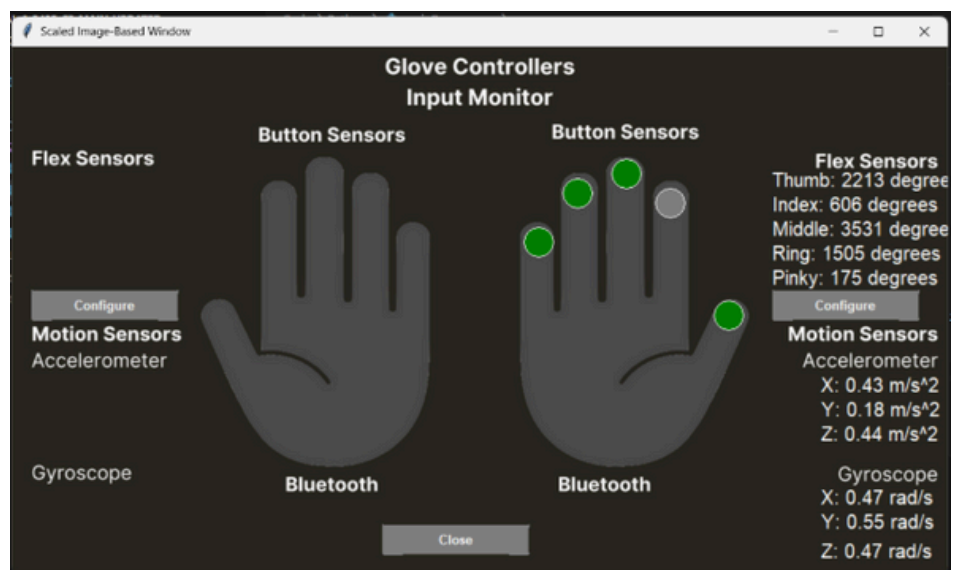


Figure 5. UI Display Monitor of Inputs

Link to Live Demo of Current Project as of April 16, 2025:

[https://drive.google.com/file/d/1JnJiEnbQbg\\_05gvDuFr3cZU-aKV0HUsP/view?usp=sharing](https://drive.google.com/file/d/1JnJiEnbQbg_05gvDuFr3cZU-aKV0HUsP/view?usp=sharing)

# COURSEWORK

## **Bachelor of Science in Computer Engineering**

De La Salle University - Manila

Expected Graduation: February 2026

Relevant Coursework:

- Embedded Systems (Lecture & Laboratory)
- Operating Systems (Lecture & Laboratory)
- Microprocessors (Lecture & Laboratory)
- Logic Circuits and Design (Lecture & Laboratory)
- Programming Logic and Design (Lecture & Laboratory)
- Computer Vision (CPE Elective 1)
- Introduction to HDL (Laboratory)
- Feedback and Control Systems

## **Senior High School - Science, Technology, Engineering, Mathematics**

UST Angelicum College - Quezon City

2011 - 2020

Relevant Coursework:

- Robotics Class using C Programming
- Fundamentals of Programming

# CONTACT

Thank you for viewing my portfolio.

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