



# Week 3 Progress Report: MCU-based Unmanned Photo Booth Prototype with PIC16F877A Microcontroller and OpenCV API Integration

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## Development Timeline

Task	April			May				June	
	2nd Week	3rd week	4th Week	1st Week	2nd Week	3rd Week	4th Week	1st Week	2nd Week
Project Proposal Approval									
Submission of Revised Project Proposal									
Procuring of necessary hardware materials									
Studying of the TB74 datasheet									
Initial test interfacing of the TB74 bill acceptor to the PIC16F877A									
Initial test interfacing of the remaining peripherals to to the PIC16F877A									
Initial breadboarding of circuit components									
Development of the foreground process for the PIC16F877A									
Development of the interrupt service routine for the PIC16F877A									



Initial test interfacing of PIC16F877A to laptop using UART and OpenCV					Blue	Blue			
Development of OpenCV Python API implementation					Yellow	Yellow			
Finalizing the layout of MCU and peripheral devices							Blue		
Integration testing and design validation							Blue	Blue	
Submission of Project									Blue

Legend: Green: Completed; Yellow: Ongoing; Blue: Not started.

## OpenCV

Developed the initial OpenCV Program in Python Language for the Photo Booth Application.

- ☒ Initial application window for the camera of the laptop to display (specifically on a 1600x940 display)
- ☒ The application is now capable of taking photos and saves the output on a specific folder by pressing the "Spacebar" key

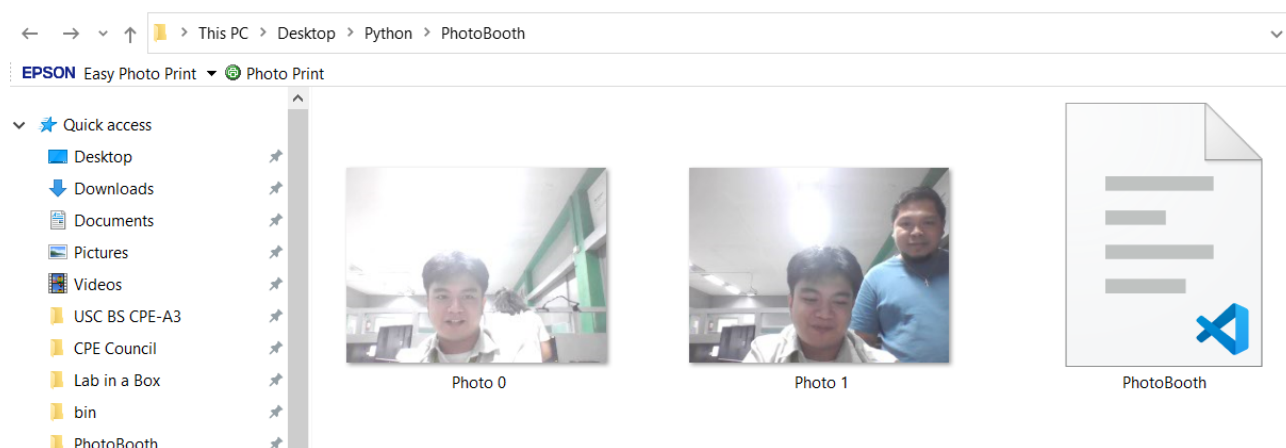


Image: Sample photo captured using OpenCV Python Programming

## UART

Since the USB to TTL adaptor has yet to arrive, no UART-relevant tests have been performed in the previous week. The item is expected to arrive within the next 7 days.



## PIC16F877A Programming & Interfacing

- ☒ Conceptualizing test module for counting the number of generated test pulses using Capture mode of PIC16F877A in Proteus Professional simulation.

This was not immediately thought of and worked on since actual handing of the bill acceptor was still very limited.

## Hardware

- ☒ Familiarizing on TB47 bill acceptor operation via reading of datasheet
- ☒ Powering of TB47 bill acceptor using circuit trainer
- ☒ Testing of different bills on the TB74 (P20, P50, P100, P500, and foreign currencies; *Important notes: TB47 rejects foreign bills; Philippine peso bills placed in different orientations are accepted*)
- ☒ Inhibit and enable configurations are tested on TB74 (1-inhibit; 0-enable)

Testing of pulse transmission activity of the TB47 was not possible at that moment due to shortage of makeshift “adaptors”, only allowing tests related to power, inhibiting and enabling bill accepting.

## Deliverables

By the following week, the team expects to accomplish the following:

- ☐ Observe pulse transmission behavior of the TB47 upon bill insertion via oscilloscope [\[Hardware\]](#)
- ☐ Record the maximum time interval of pulse transmission from the TB47 [\[Hardware\]](#)
- ☐ Finish test module for counting the number of generated test pulses using Capture mode of PIC16F877A in Proteus Professional simulation [\[PIC16 programming\]](#)
- ☐ Automatically record time after last pulse [\[PIC16 programming\]](#)
- ☐ .hex file for recording the number of pulses transmitted by the TB47 based on Capture mode test module simulated in Proteus [\[PIC16 programming & interfacing\]](#)
- ☐ Implement LCD display to echo the bill acceptor status [\[PIC16 interfacing\]](#)
- ☐ Implement LED indicators to indicate the bill acceptor status [\[PIC16 interfacing\]](#)
- ☐ Test and familiarize UART implementation using USB to TTL adaptor [\[UART\]](#)
- ☐ Timer on the Photo Booth Application [\[OpenCV\]](#)



## Project Management

### Team Composition

**Danica Marie Dumalagan** (Team Leader/System Design Lead/All-around) - is responsible for the management of the project, development of the overall system design. As a team leader, represents the team to the instructor and actively participates in both hardware and software development.

**Jhaycee Anthony Acain** (Member/OpenCV & UART Lead) - Assists the team leader, is mainly in-charge of the implementation of the desired functionalities via software programming for the OpenCV Python API and UART applications in the project.

**Thomas Lee Castro** (Member/PIC16 Interfacing Lead/Hardware Lead) - Assists the team leader and is mainly in-charge of the procurement of materials and development of the hardware circuitry and programming necessary for the peripherals to be properly interfaced to the PIC16F877A.

### Task Assignment

1. Procuring of necessary hardware materials - Castro
2. Studying of the TB74 datasheet - Castro
3. Initial test interfacing of the TB74 bill acceptor to the PIC16F877A - All members
4. Initial test interfacing of the remaining peripherals to to the PIC16F877A - Castro & Dumalagan
5. Initial breadboarding of circuit components - Castro & Dumalagan
6. Development of the foreground process for the PIC16F877A - Castro & Dumalagan
7. Development of the interrupt service routine for the PIC16F877A - Castro
8. Initial test interfacing of PIC16F877A to laptop using UART and OpenCV - Acain & Dumalagan
9. Development of OpenCV Python API implementation - Acain
10. Finalizing the layout of MCU and peripheral devices - Dumalagan
11. Integration testing and design validation - All members