

# Conclusion to CpE301

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**Goal:**

*To send 6 values to thing speak; four from the apds 9960, and two from the Si7021. All of these values were to be sent through the ESP-01.*

## I. COMPONENTS

### A. Atmega 328P Xplained mini

The Atmega 328p xplained mini is a micro controller development board that allows for hardware debugging. This allows the developer to stop the PC counter at any instruction to observe the current state of the micro controller,

### B. Si7021

The Si7021 sensor is a temperature and humidity sensor.

### C. ADPS9960

The most interesting and coolest discrete component we interfaced with throughout the course. This sensor has the ability to register the quantity of clear light, red light, green light and blue light given off by a light source, or light reflected off an object. In addition to the ability to quantitate the surrounding light, it is also able to determine gestures based off of those lights and send an interrupt based on sensed motion, proximity or lack of proximity. I really can't wait to utilize this sensor for personal projects!

### D. ESP-01

The ESP-01 is a WIFI enabled micro controller that is controlled using "AT" commands.

## II. SCHEMATICS

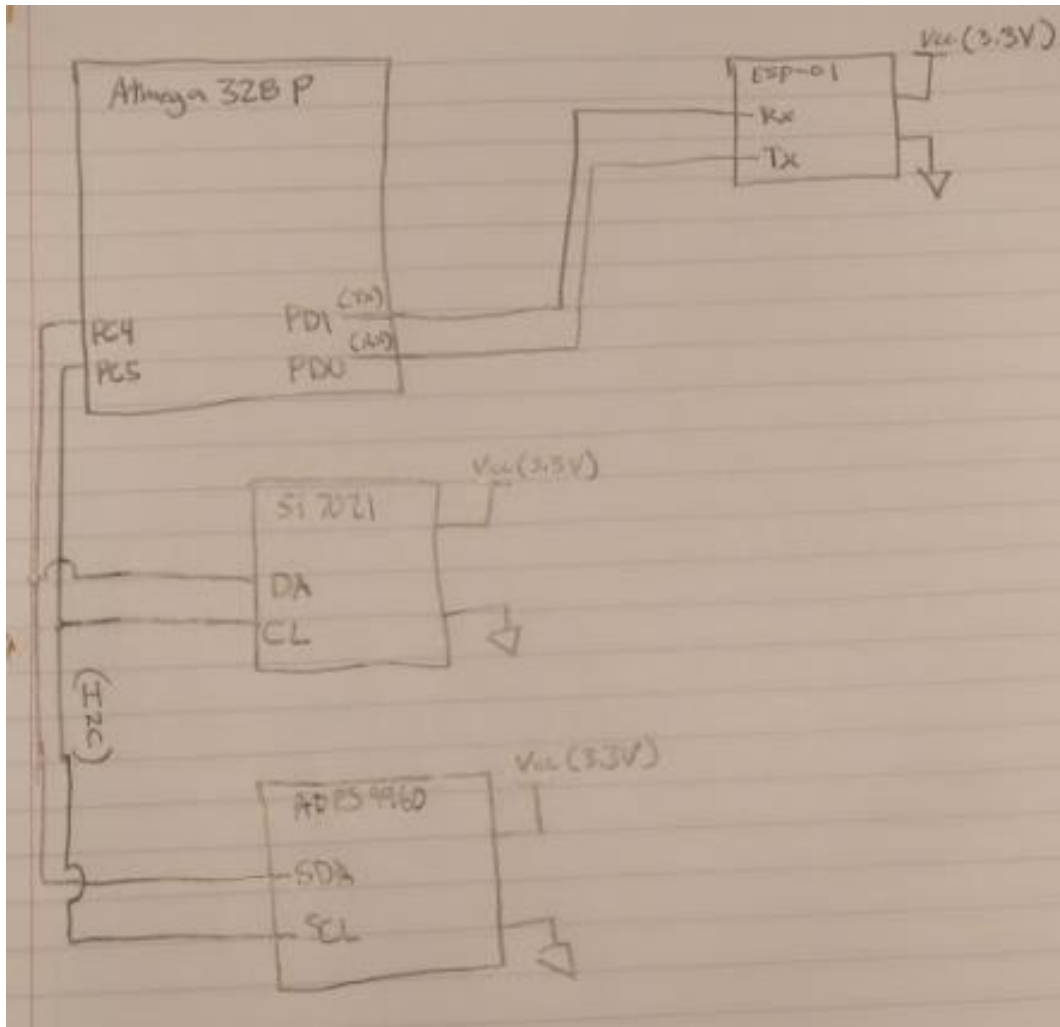
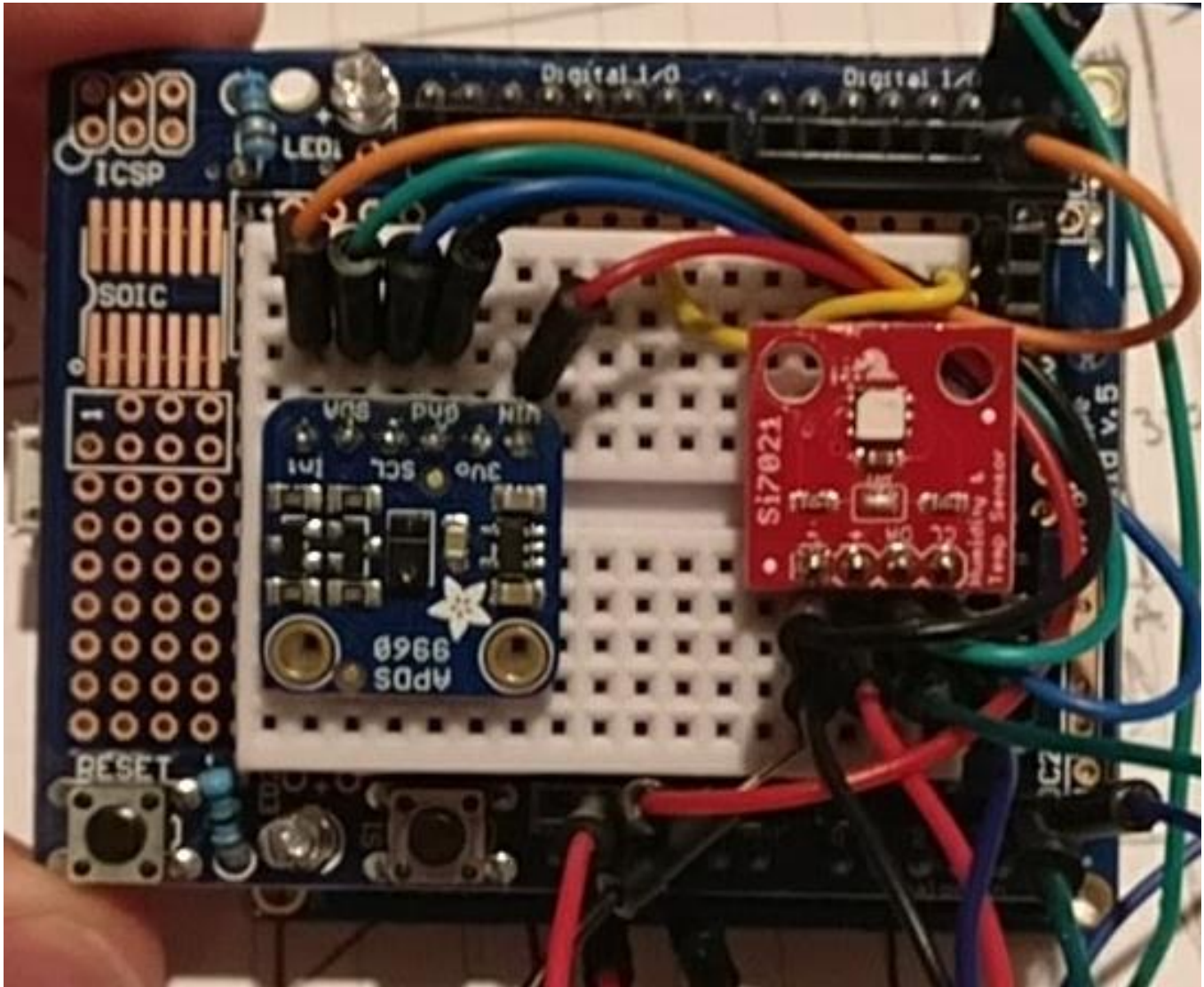


Figure 1: Wiring Diagram

## III. IMPLEMENTATION

Implementation of this project was heavily dependent on the provided code from the instructor. The main take away is that the APDS and Si sensors are connected to the I2C pins on the Atmega, allowing them to share a clock and data bus. It's important to note that both sensors and the wifi module require 3.3 volts to the critical bits, luckily the APDS sensor was designed to have the option of drive voltage between the 3.3 and 5V.

## IV. SNAPSHOTS AND





#### V. LINKS

<https://youtu.be/VM9CnseYFEY>

<https://youtu.be/6nFOOcOBG7w>

#### VI. CONCLUSION

The possibilities for these sensors are endless. These combinations could easily be used for water management of flowerbeds, crops etc. The ADPS has applications in human interfacing to technology as well as automation of day time dependent tasks.

Over all this project ended up being very messy, complicated and not very well understood by myself, this will be an area of future study and development for myself as these concepts are fundamental building blocks to many embedded systems.