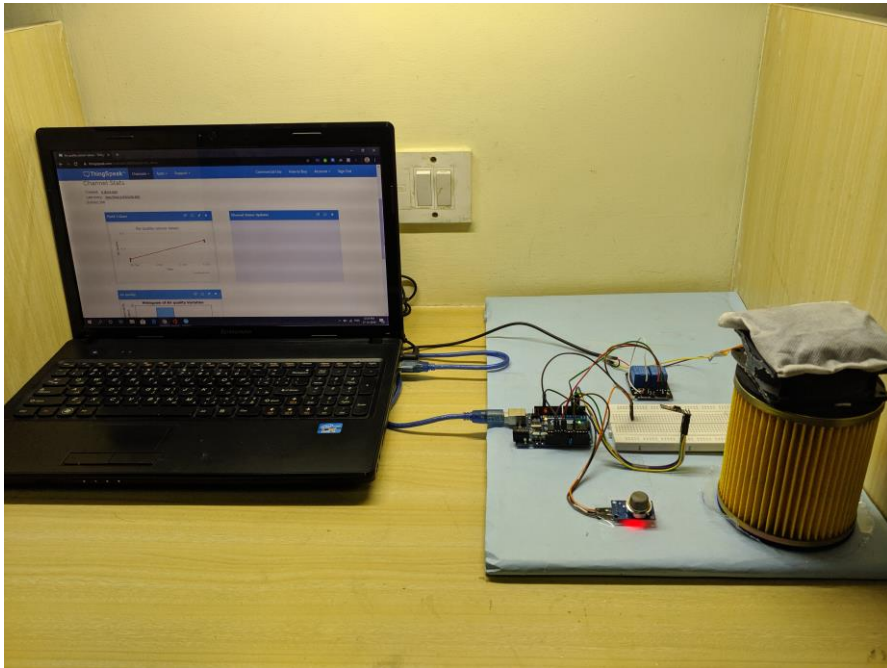
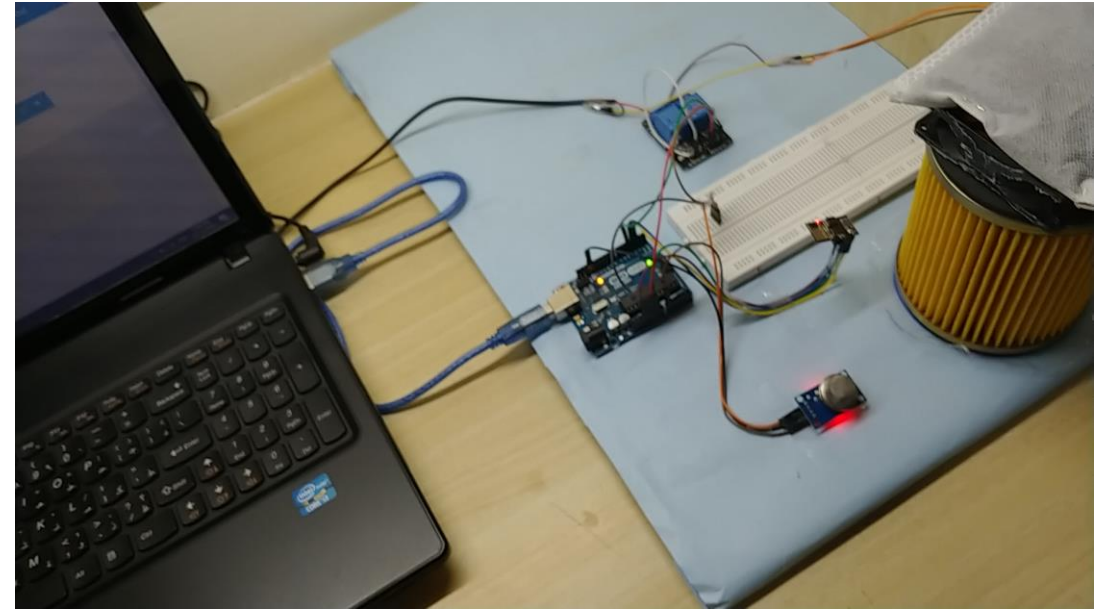


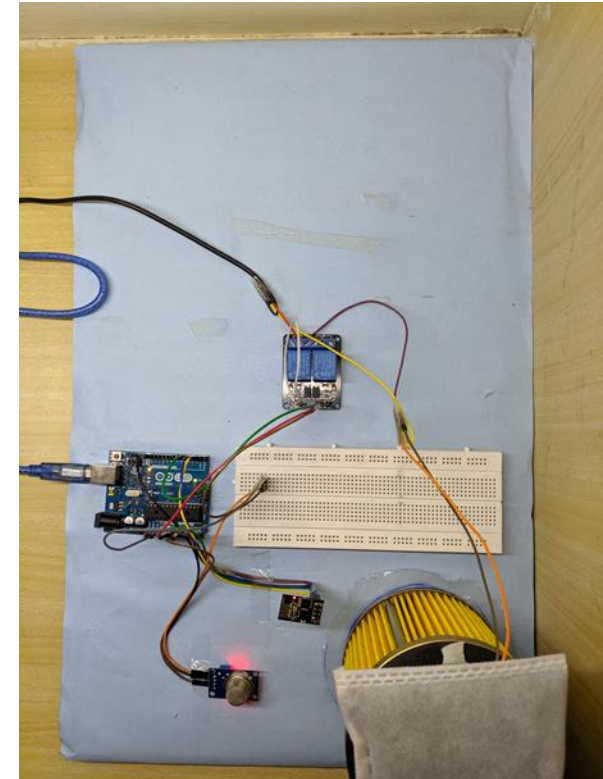
Air Monitoring Cum Smart Purifier.



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Concept

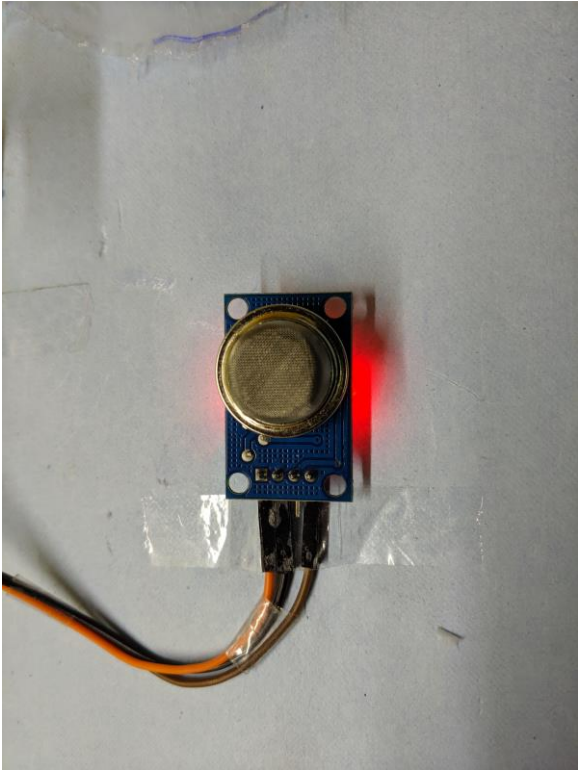
- In this project, we make use of Arduino and air quality detecting sensor which is connected to a purifier to invoke the purifier, when the air quality is less. The real time air quality can be viewed through a IoT cloud platform called “Thingspeak” and this data can be used to get useful insights.

Tech Used

- Arduino programming
- IoT
- Cloud
- Big Data
- Air purifying Concept.



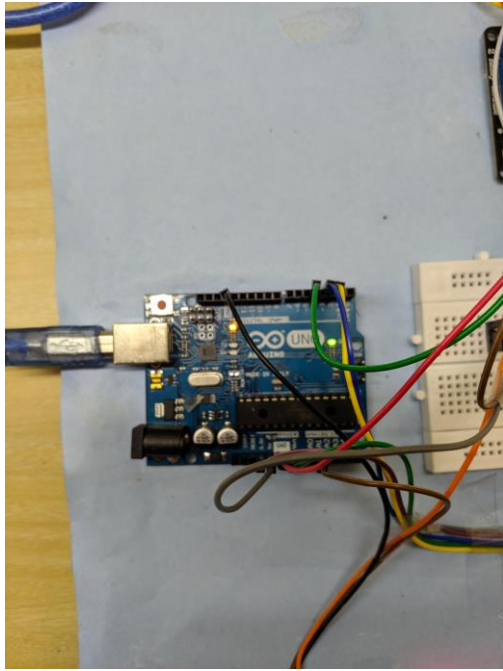
Working



MQ 135 Sensor is very much sensitive towards gases like methane, ammonia, sulphides, nitrates, smoke etc.

When it detects these impurities in the air, it will increase its voltage and will give much higher sensor values.

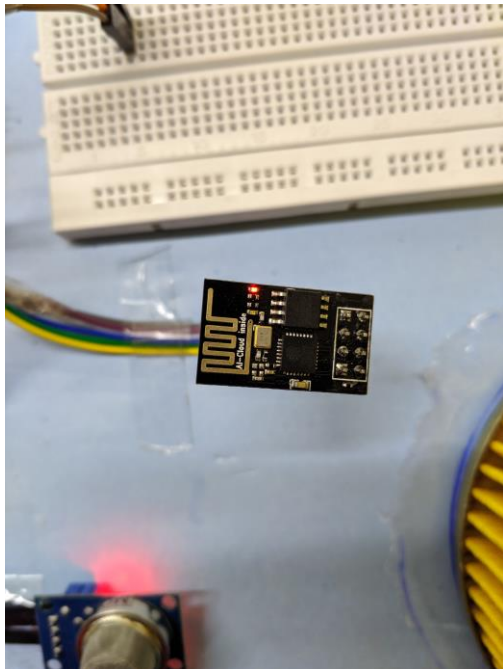
This sensor will give an analog value which can be converted to PPM value by multiplying the analog value with $(5.0 / 1023.0)$. So this value will enable us to know the amount of impurities present in the atmosphere.

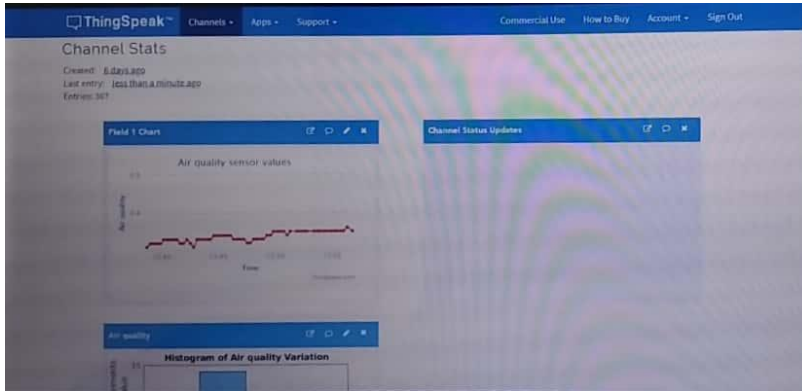


This sensor value will be given to a Arduino board for the processing. From Arduino board, the value will be transferred to the Laptop and will show the real time value in the serial monitor in Arduino IDE.

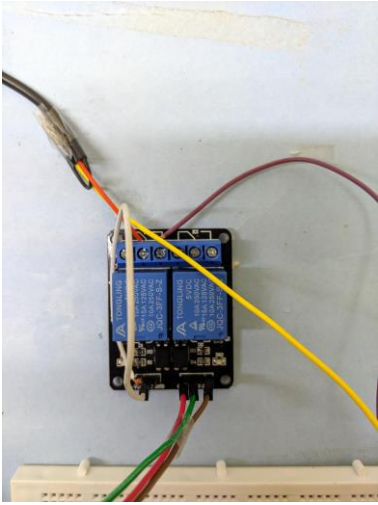
The PPM value calculated, will be transferred to a Wi-Fi module(ESP-8266-01) connected in the Arduino board. The Wi-Fi Module will be connected to a Hotspot or router.

The WIFI module is connected to hotspot using AT commands. The real time data will get transferred a IoT cloud platform called “Thingspeak”.

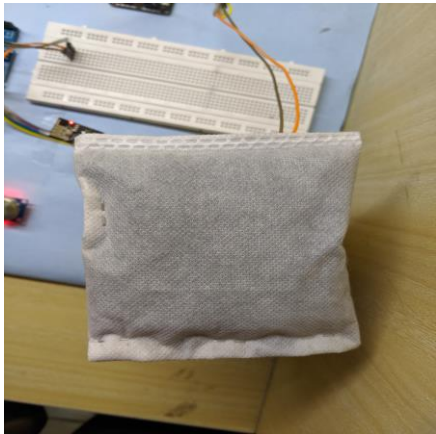




- Thingspeak is IoT Cloud platform, where we can send the data of sensor through internet and will give us real time monitoring on air pollution from anywhere in the world.
- From this platform, we will be even able to obtain XML data sheets which will be very useful to find many insights about the pollution rate of the area, which is the peak as well as the lowest period of pollution, etc.
- From the lowest value obtained, I have assigned the purifier to start working after the PPM is above the value



The purifier consist of a air filter, a 12v DC fan and a bag of activated charcoal. When the PPM is more, the relay will get activated and will turn on the fan which will suck air through the air filter and it will make the air (containing impurities) to pass through the activated charcoal bag, which result in the filtering of suspended particles in air as well as harmful gases. Once the PPM get lower to the safe value, the relay will get turned off which will turn off the fan too. Thus this cycle continues and will turn on the purifier when the PPM is more



Bag of activated charcoal

DC Fan

Air filter



Application

- This product can be fixed inside government Buses, which will help in detecting the impurities present in different places and their variation with time as the bus travel in different places. If the bus has a GPS in it, data with location can be stored for more accurate results. When the PPM value is more the air purifier will be invoked which will purify the air and help the passenger to breath more clean air. This will increase the passenger experience and can contribute a little in making a ordinary man's life better.

Advantages

- The data stored can be used for making pollution map
- Will give huge pile of accurate data for data analysis to get useful insights
- Will give real time air quality
- From the data obtained from the product, success of air pollution control policies can be assessed.
- Will make use of absorbent in purifier only when required, resulting in more efficiency.

Effect of this project in India

- India's ordinary people travel in government bus for transportation, this product can increase their travel experience
- Many people get many breathing difficulties while exposed to dusty atmosphere, while in bus this can be in even worse, but with this product this can be avoided as purifier will work when air is polluted.
- This project will produce useful data to make pollution map ,pollution analysis so time and effort wastage for the procedures can be avoided.