
AUTOMATIC AIR PURIFIER

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Abstract

Air pollution is a mixture of solid particles and gases in the air. Car emissions, chemicals from factories, dust, pollen and mold spores may be suspended as particles. OZONE, a gas, is a major part of air pollution in cities. When ozone forms air pollution, it's also called smog. If the air quality index (AQI) reports are anything to go by, then the quality of air in most cities of India is deteriorating day by day. As the winter months of October and November approach, the air quality outdoors becomes worse since the pollution that is generated from various sources gets trapped because of differences in air pressure, moisture and wind speeds. This also tends to have a direct influence on the indoor air quality in home or office spaces here most individuals tend to spend approximately 90% of their time. In the past decade or so, the home air purifier market has shifted multiple gears as an affordable solution for indoor air quality. Besides this, there have been seemingly ground breaking advancements in filtration technologies ensuring the development of the next level in air purifier.

1. INTRODUCTION

An air pollutant is a material in the air that can have adverse effects on humans and the ecosystem. The substance can be solid particles, liquid droplets, or gases. A pollutant can be of natural origin or man-made. Pollutants are classified as primary or secondary. Primary pollutants are usually produced by processes such as ash

from a volcanic eruption. Other examples include carbon monoxide gas from motor vehicle exhausts or sulfur dioxide released from factories. Secondary pollutants are not emitted directly. Rather, they form in the air when primary pollutants react or interact. Ground level ozone is a prominent example of a secondary pollutant. Some pollutants may be both

primary and secondary: they are both emitted directly and formed from other primary pollutants. **CONTEXT:**-Around 3 billion people cook and heat their homes using polluting fuels (i.e. wood, coal, dung, kerosene) and inefficient technologies. Cooking and heating with polluting fuels and technologies produces high levels of household air pollution which includes a range of health damaging pollutants such as fine particles and carbon monoxide. According to WHO, around 3.8 million people a year die from the exposure to household air pollution. This household air pollution comes from a variety of sources, and includes a wide range of gases, chemicals and other substances. One of the most dangerous types of pollution is perhaps the most familiar: smoke. Pollutants emitted by the incomplete combustion of solid fuels or kerosene for cooking, heating and lighting are associated with serious health risks. Other indoor air pollutants include mould, building materials, home products, volatile organic compounds (VOCs) and naturally occurring gases like radon. Pollutants with the strongest evidence for public health concern include particulate matter (PM), carbon monoxide (CO), ozone (O₃), nitrogen dioxide (NO₂) and sulphur dioxide (SO₂). Health problems can occur

as a result of both short- and long-term exposure to these various pollutants. For some pollutants, there are no thresholds below which adverse effects do not occur.

2. RELATED WORK

Fine particles are an especially strong indicator of health risks, as they can penetrate deep into the lungs, enter the bloodstream, and travel to organs. In some poorly ventilated dwellings, concentrations of particulate matter can exceed WHO-recommended levels by a factor of 100.

Continued exposure to environments with poor air quality is a major public health concern in developed and developing countries. It is estimated that the pollutants responsible for poor air quality cause nearly 2.5 million premature deaths per year world-wide. Significantly, around 1.5 million of these deaths are due to polluted indoor air, and it is suggested that poor indoor air quality may pose a significant health risk to more than half of the world's population. Due to its link with industrialization, societal health problems associated with poor air quality disproportionately affects developed and developing nations – it is estimated that air pollution is responsible for the premature deaths. Remedial action to improve air quality is often easy to implement once airborne pollutants have been detected.

3. IMPLEMENTATION

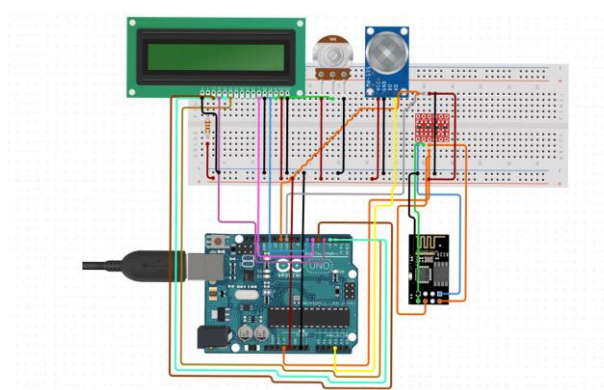
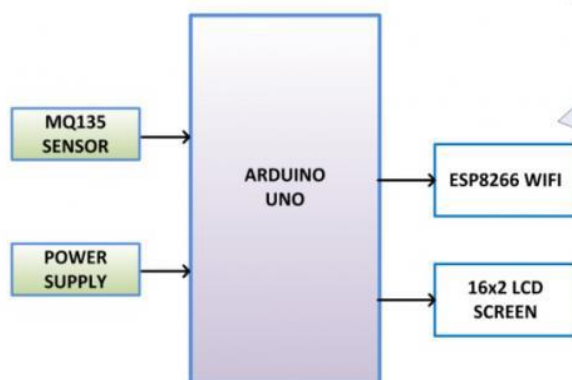
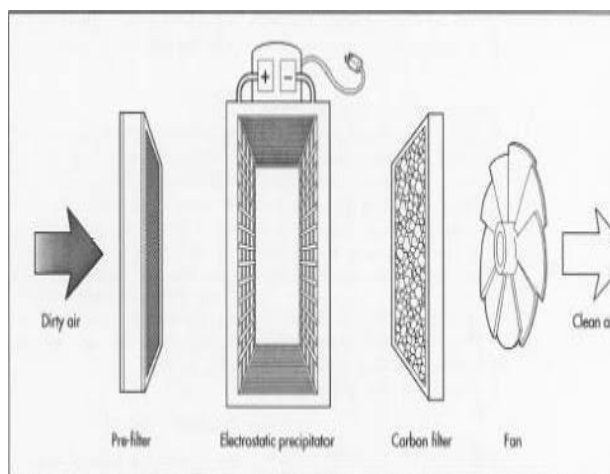
Long-term exposure to **polluted air** can have permanent health effects such as: Accelerated aging of the lungs. Loss of lung capacity and decreased lung function. Development of diseases such as asthma, bronchitis, emphysema, and possibly cancer.

There are many methods to control air pollution like planting trees, using renewable resources and air purifiers. But also we can see there is reduction in air pollution ,due to this many people are not able to breathe properly even in their houses ,and facing many health problems .

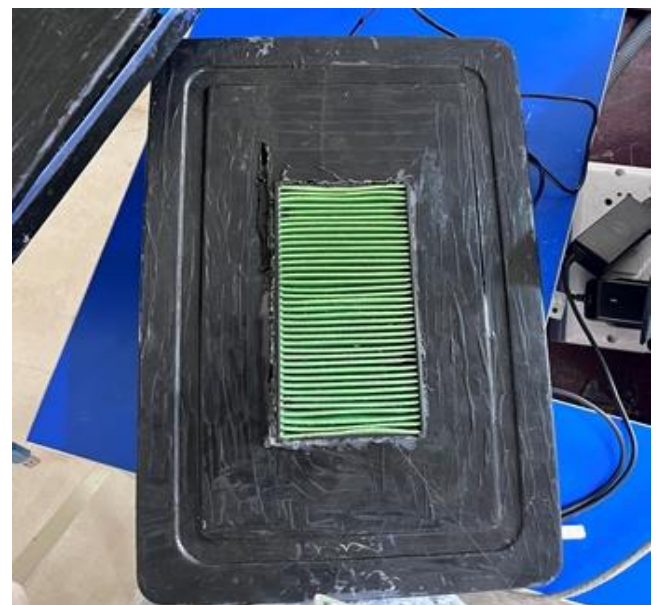
The main motto of our project is that to reduce the pollutants in air and reduce the diseases due spreading due to air pollutants. To combine advanced detection technologies to produce an air quality sensing system with advanced capabilities to provide low cost comprehensive monitoring. To display the sensed data in user friendly format in LCD display panel. Basically our model can be divided into two parts one is the air purifier part and other is the monitoring of air pollution device.

It will on automatically when pollution is detected and automatically off when the air is purified.

As we have gone through the need statement with literature review .so that we can know what exactly our machine must contain .By considering the drawbacks we designed a machine that doesn't consume a lot of electricity . It should not be expensive (everyone can afford it). Its also durable and doesn't have high maintenance .Its easily portable. We have to make a model of air purifier with hard cardboard ,and make a square shape . And we want two different types of car filter (one is cylindrical and other one is rectangular). The air pollution monitoring device developed in our project is based Arduino UNO. The Arduino board connects with ThingSpeak platform using ESP8266 Wi-Fi Module. As the cities usually have Wi-Fi hotspots at most of the places, so the device can be easily installed near any hotspot for its operation . The ThingSpeak is a popular IOT platform which is easy to use and program. The sensor used for monitoring the air pollution is MQ-135 gas sensor. The sensor data is also displayed on a character LCD interfaced in the monitoring IOT device.

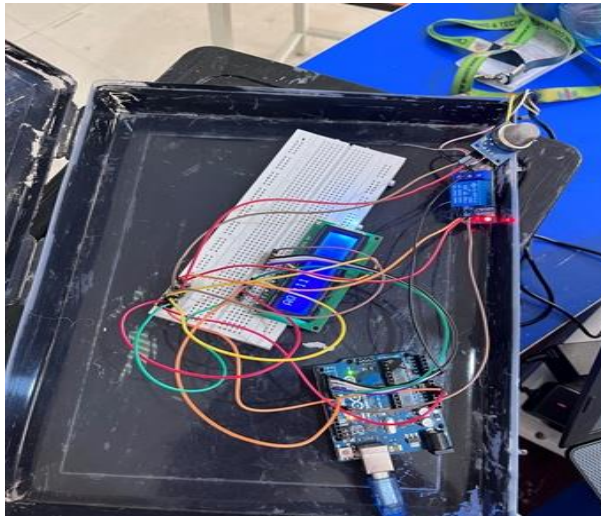


should also be durable and doesn't have high maintenance. We have to make a model of air purifier with hard cardboard (square shape), two different types of car filter, a switch, exhaust fan and a battery. By installing cylindrical filter in the middle and connecting it to exhaust fan, battery and all the connections to switch. By installing rectangular air filter at the opening of cardboard the air purifier will be ready to work. It is very less in cost and as well as effective.



4. EXPERIMENTAL RESULTS

As we have gone through the problem statement. So, we came to know what exactly must our machine contain. By considering the drawbacks, we designed a machine that doesn't consume a lot of electricity. It shouldn't be expensive. It



5. CONCLUSION

By our innovation in our project, we can reduce the pollutants in the air and the diseases causing due to air pollution. To make an air purifier which can be affordable to everyone and has low maintenance, we have learnt much from this topic or project which we took up. And we hope this will help the society for overcoming problems like air pollution.

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