Abstract:

One of the world’s greatest concerns is global warming and climate change. UAV technology is in high demand because of their multipurpose and flexibility. Moreover this technology is highly acknowledgeable as well. The idea of this project is to build a drone that will detect and monitor the air quality over different landscape and provide data of the concentration of the pollutants for further analyzes. This analyzes will help in the improvement of the air quality that we breathe in and for the better health of the citizens of our Dhaka city.

Introduction:

We have built an air quality monitoring device. Our device is a multifunctional drone that detects the harmful pollutants in the air and records the data of those pollutants concentration. It is an affordable environmental drone that will monitor the air pollution, with low-cost sensors embedded within it. The gas detector sensors used are MQ 2, MQ 7 and MQ135 and high precision dust sensors are also used alongside this. These drones are very easy and convenient to use both on land and air. They are very stable and lands vertically due to the drone having multi-rotor

Purpose:

The motivation and purpose behind our project was the deteriorating health of citizens, the global climate change and plant life. Due to this air pollution there is a progressive increase in lung and cardiovascular disease patients in our country. Air pollution also causes global warming and acid rain. Acid rain harms plant life and due to the increasing amount of harmful pollutants in the nature we can observe various signs of climate change worldwide. These are the thoughts that made us took this initiative.

Acknowledgement:

This project was supported by our honorable faculty, project supervisor Dr. Mohammad Ashrafuzzaman Khan sir. We would like to express our deepest gratitude for his constant and thorough supervision and guidance in the completion of our project for our capstone course. We are also grateful to the Electrical and Computer Engineering Department of North South University for providing us with the opportunity of doing such a course under such great supervision in our undergraduate program.

Features

• Measure pollutant levels accurately

• Provides accurate and stable data output directly to a PC with the use of an USB cables:

Method:

There are many different sizes of drone. In military the larger ones are used. The second one after the larger size drones are the one we made with fixed rotors. These are the best for geographical and environmental surveying purpose. We have integrated different sensors for different purposes are assembled in drones. We have used Arduino CC for sensors calibration with drone as it gets the codes in and takes in the data. Fritzing software has been used for the correct and complete circuit diagram. Our drone has four rotors and from the picture below the circuit with sensors are embedded in between in connection with the rotors



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Real Time Data:

The Department of Environment (DoE) in Bangladesh states the AQI is higher because of the following pollutants: Particulate Matter (PM10), Particulate Matter (PM2.5), Nitrogen dioxide (NO2), Sulphur dioxide (SO2), Carbon Monoxide (CO) and Ozone (O3). We have recorded real time data from Uttara and Bashundhara Residential Area at this present moment. Below there is a data set of 10 values of the concentration of carbon monoxide recorded by our air monitoring device from the stated areas of Dhaka city:

|  |  |
| --- | --- |
| Carbon Monoxide (CO)  (safe level - 50ppm) | Carbon Monoxide (CO)  (safe level - 50ppm) |
| Uttara | Bashundhara |
| 89.69ppm | 174.58ppm |
| 90.00ppm | 174.58ppm |
| 88.15ppm | 128.93ppm |
| 88.73ppm | 165.17ppm |
| 88.67ppm | 165.33ppm |
| 88.77ppm | 165.65ppm |
| 93.70ppm | 165.66ppm |
| 88.74ppm | 167.20ppm |
| 88.79ppm | 164.17ppm |
| 89.39ppm | 169.38ppm |

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Future Work:

We are planning to install air filters with our drone for the filtration process. Our plan is to take data and in parallel filter the harmful air we are recording the data of. We further plan to analyze and carry out filtration with the instalment of heap mini in our drone.

Conclusion:

Globally air pollution is a major concern not just in our country. Our project features an air-monitoring device with low cost sensors which navigates itself to different location with the help of GPS technology and detects and monitors the air pollutants, alongside provides the data.An air quality index (AQI) is issued by the government of every country. It is a way of the governments of the different country to share with the citizens about the latest condition of the air pollution. Dhaka city ranks in among the worlds most polluted cities by this ranking. Thus air-monitoring devices these days are high in demand and in research.