Web Server Based Air Pollution Monitoring

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Abstract: The pollution levels in the air have increased to a level due to the advent of new technologies, which is considered to be dangerous. Considering this in mind many countries around the world has started analyzing the air quality of every locality and suggest measures to reduce the air pollution measures has been taken care of. Thus this paper attempts to develop an air quality assessment method, which involves the quality measure of the air and also provides a suggestion or an analysis on how the air quality is available in the locality and likewise would also finalize the ideas that would help improve the air quality. The methane sensor, Carbon monoxide sensor and the dust sensors are used in order to provide the inputs for the air quality analysis. This paper attempts the to acquire the current data of air pollution levels in the air and the suggestion generation for the better future planning in the air pollution control in a particular area. This web based support system is developed in order to get rid of the higher level of pollution level by analyzing the current level of the air pollution levels and also to suggest the people with the amount of air pollution in the particular area and create a logging system which could provide the idea about the air pollution profile. MQ-4, MQ-7 and DSM501A Dust Sensor are the sensors that are used to sense the methane level, carbon monoxide and the dust level in the air. Updating the data in the cloud helps global reach of the local data. The profile of the air pollution would be considered for a locality and suggestions would be provided in order to reduce the air pollution.
Key Words: Air pollution Control, Web Server, wireless sensores, Embedded Systems

I.   Introduction

Practically speaking, fuels are not unadulterated hydrocarbons and motors don't consume them cleanly. Thus, debilitates from motors contain a wide range of contamination, outstandingly particulates (sediment of different sizes), carbon monoxide (CO), a noxious gas), nitrogen oxides unstable natural mixes (VOCs), and Lead (Pb) and in a roundabout way created ozone. Combining up these toxic gasses and empowering it with daylight delivers in some cases caramel, some of the time pale blue haze of contamination called smog, which can hang over urban areas for a long time [1].

Due to air pollution it gives out air unfit for breathing by all the beings in the world. Air contamination issue has been bothered by the enormous increase in the quantity of versatile sources (engine vehicles) in urban zones. The most recent accessible information on air quality have provoked WHO to call for more prominent attention to wellbeing dangers caused via air contamination, execution of viable air contamination moderation arrangements and close checking of the circumstance in urban areas around the world. In April 2014, WHO issued new data subsequent to evaluating that open-air contamination was in charge of the death of around 3.7 million individuals less than 60 years old in 2012 [2]. Literature [3] has explored sensitivity and impacting elements of Metal Oxide Gas Sensors. They have arrived at the conclusion that the sensitivity of the metal oxide based materials changes with the elements impacting the surface responses, for example, (i) chemical components, (ii) surface- modification, (iii) microstructures of sensing layers, (iv) temperature and (v) humidity. Writing [4] says that air contamination caused by fumes gasses from vehicles has turned into a basic issue. The essential gasses that cause air contamination from cars are nitrogen oxides, and carbon monoxide (CO). It is characterized gas sensor as a gadget that can substitute for human olfaction, and that changes over a physical marvel into an electrical signal.

Literature [5] watch that authentic methodologies for checking air contamination for the most part utilize costly, perplexing, stationary types of equipment. This worldview is changing with the emergence of

lower-cost, simple to-utilize and compact air contamination screens (sensors) that give high-time determination information in close constant. These characteristics give chances to upgrade of the scope of existing air contamination checking capacities and maybe give roads to new air observing applications.

Sensors related with to progresses in figuring and correspondence likewise give upgraded accessibility and openness of air observing information. Sensor gadgets are as of now accessible for checking a scope of air toxins and new gadgets are persistently being presented . In writing [6] had thought of a proposition ecological checking framework called ArduAir which is a little and compact estimation framework which incorporates different gas sensors and microcontroller that can be utilized by various people all the while.It has been proposed a product for gathering information from the ArduAir and plotting it continuously which will furnish the client with (i) Low-cost and low-control estimation equipment that is appropriate for portable estimation, (ii) User-accommodating information accumulation and handling programming, (iii) Gathering important information and (iv) Easy to utilize instrument that can be utilized financially by countless.

This Paper is organized as takes after. Section 2 will give a short thought regarding the scenery for this venture and lays the base required to know whatever is left of the hypothesis. Section 3 discusses the results and discussion Section 4 conclusin about previews of working module taken after by conclusions and recommendations for future work.

II.   Automated Air Pollution Monitoring:

In this paper, the initial stage starts with acquiring Dust values, Gas & Ammonia and then those values are viewed and based on displayed valued actions are taken.This system makes use of Raspberry Pi and WEBSERVER to notify the people about the pollution condition in their area using web server and also information is available in the web site.

The hourly data of the particular piece of land that is under monitored is stored in the remote database i.e Amazon Account (on-line) from which the farmer (user) can get the data at any time and at any instant from his mobile phone just by sending an prescribed format of message.
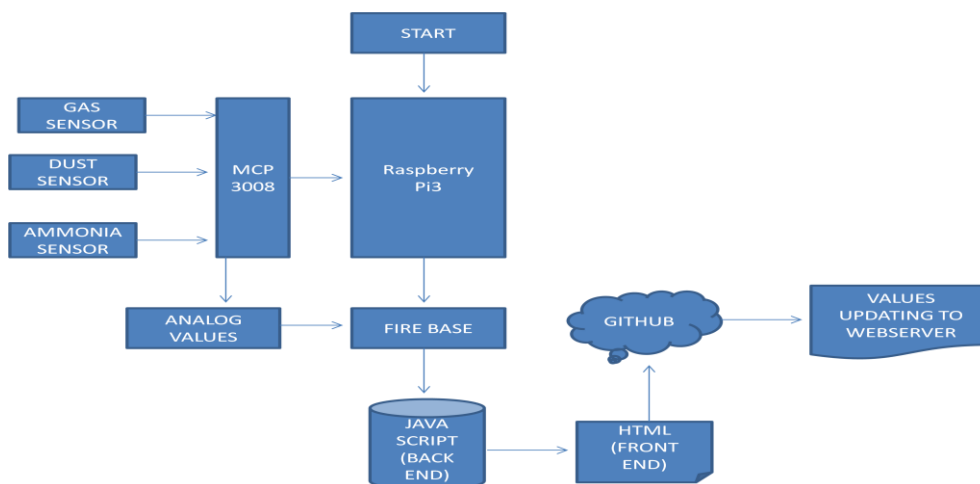
Overall Block Diagram of the Webserver Based Air Pollution Monitoring

III.   Results and Discussion:

The sensor data are observed at different scenarios inside the campus of the BMS college of Engineering, Bangalore. The three different scenarios inside the campus, at the entrance of the college and the outside the campus were observed as given in the below figures. The Figure 1. depicts the data that is observed at the entrance the college campus. It is observed that the value observed for the gas sensor data is 0.41.
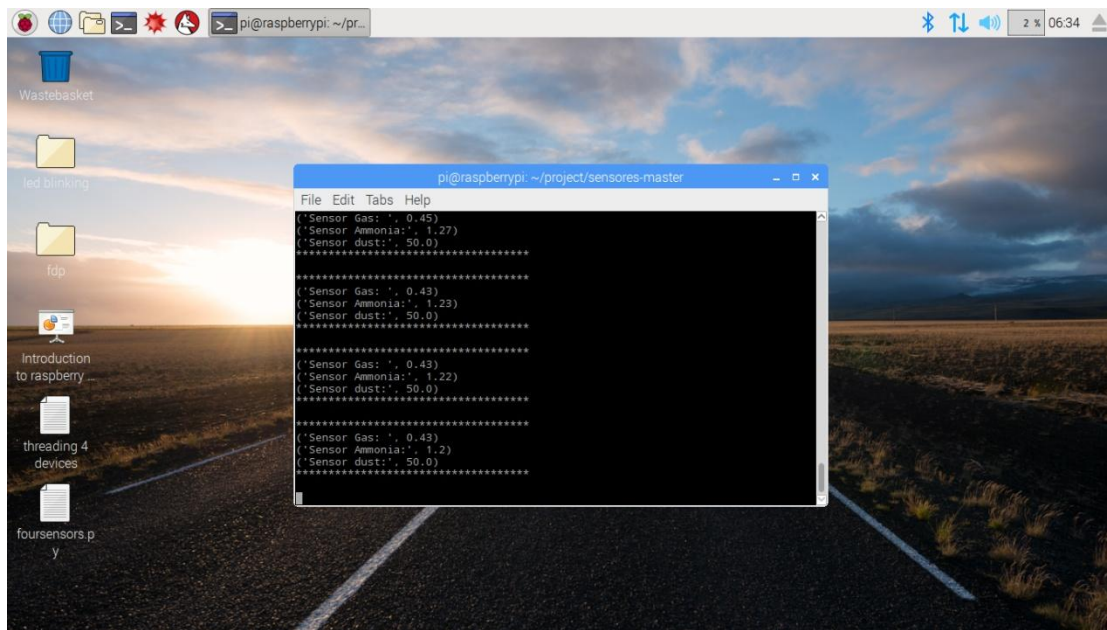
Figure1. At the entrance the Campus

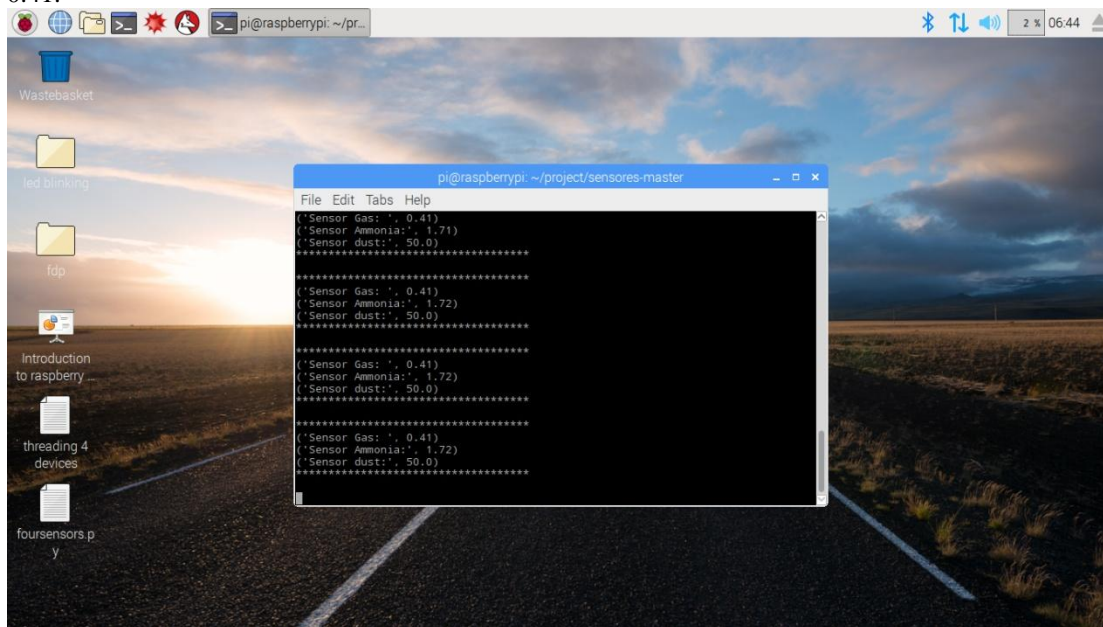The Figure 2 shows sensor values observed inside the campus. It is observed that the amount of gas sensed is 0.41.

Figure 2. Inside the campus

Figure 3. depicts the amount of sensor data observed outside the campus.The value of the gas data observed is 0.44.
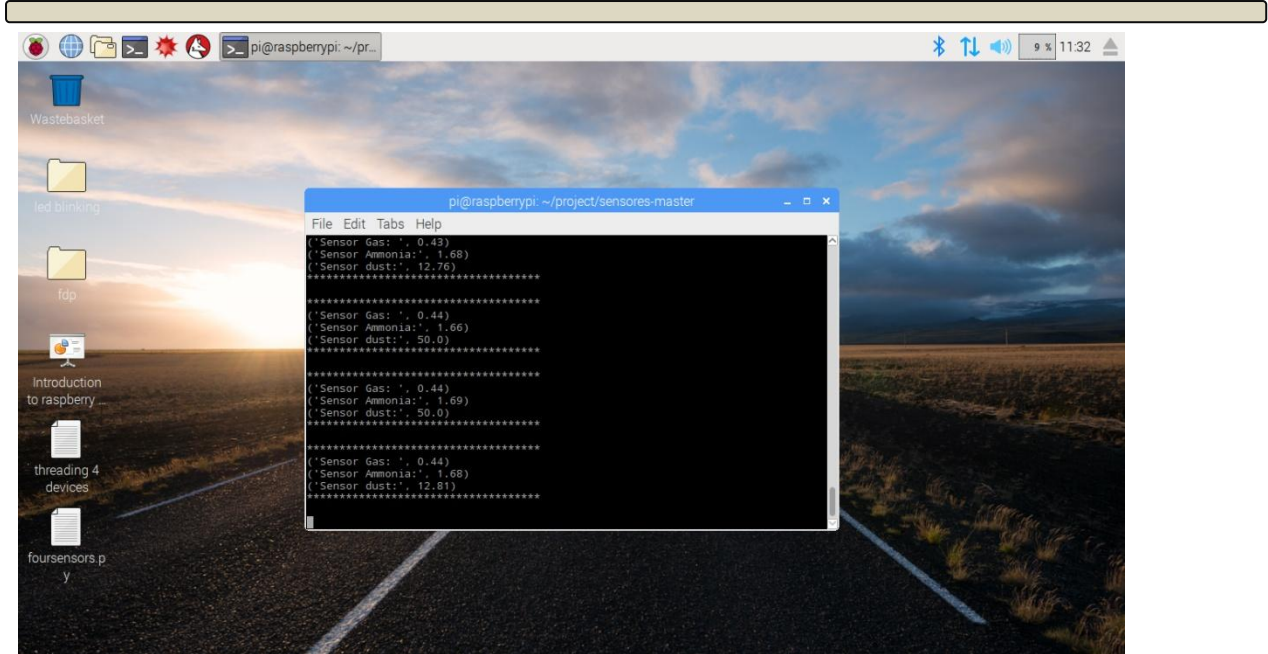
Figure 3.Outside the campus

The sensor data thus obtained are updated on the webserver developed by the Firebase cloud environment which act as the webserver.The results of the sensor output display can be displayed as shown in the Figure 4,Figure 5 and Figure 6 for the sensor data received outside the campus, at the entrance of the campus and inside the campus respectively.

Screenshots of webserver displaying the status of each sensor.