Self Automated Tool in Vehicular System That Identifies the Air Pollution and the Future of E-Governs

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Abstract— Air pollution is a major issue that we face today. Pollution zone in during earlier century was low but keeps growing towards the current. Studies revealed the fact the concentration in organic and inorganic toxic elements keeps growing depending upon the region and vehicle type. There is a growing demand for the environmental pollution monitoring and control systems. Gas sensors help to detect gas molecules and the concentration of the gas analytical methods of identifying the gases has greater disadvantage than with fairly accurate and selective gas reading.

Index Terms—Embedded control, Monitoring system, Remote monitoring, sensor.

I. INTRODUCTION

Stationary and mobile services release various chemical pollutants, including suspended particulate matters (SPM), carbon monoxide (CO), oxides of nitrogen (NO_X), Oxides of sulfur (SO_X), lead aerosol, volatile organic compounds, and other toxics.

Practical implementation of control mechanism indeed focuses on the GIS environmental setup how the toxic elements are spread over. There are no specific tool to make vehicular pollution control, where it helps the individual who own the vehicle to make a self test for servicing and a tool for licensing authority to govern the vehicle by the remote system with the help of pervasive computing.

The paper mainly focuses on identifying the vehicle which is the major cause of air pollution.

The paper is about the proposed work is to implement a control mechanism for a vehicle which enables the user to identify about the normal exhaust level of the vehicle which may not have a major effect over the air pollution. The System can be permitted to drive if the vehicle is properly maintained. The vehicular system can be categorized based on

a. Types of fuel used (Petrol, Diesel, Dual)
b. Average age of the vehicle
c. Usage of the vehicle (Private, family, public)
d. Speed of the vehicle
e. Engine size

II. OUTCOME

1. Removing / retiring gross emitters from fleet.
2. Target gross emitters with inspection and maintenance schemes.
3. Encouraging vehicle tuning.
4. Replacing older and or retrofitting appropriate emission control technology.

III. WIRELESS SENSOR NODES

Information on air quality is either highly sparse or completely non-existent. Sparse in the sense they are highly localized around a particular city or institute.

An urgent need to complement existing air quality monitoring methodologies with flexible and affordable alternatives, to improve monitoring capabilities for both scientific and legislative purposes, to allow source attribution and to improve understanding of health impacts of urban air quality.

Fig1.1 shows the various application of WSN. The one highlighted in green shade areas on which our focus can be taken part.

Available or integrated sensor and actuator are used up to measure the various values that help to concentrate on the pollution level of the vehicle.

Inbuilt spark ignition controller identifies the maximum spark, which is used to measure the outlet spark and the overall combustion level suspected.

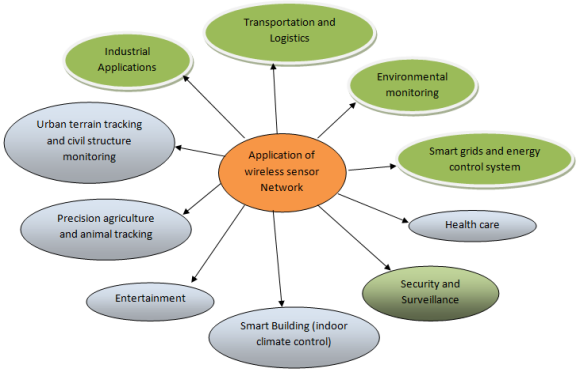

Fig.1.1 Application of wireless sensor Network

Waste gate actuator along with the heat shield is helpful in collecting the exhaust gas, by which the proportion of the air mixture or the concentration of various gases are identified

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with the help of electrochemical sensor. We have chosen electrochemical sensor since its noise is low, has high linearity and are highly suitable for urban air quality measurement.

IV. POSITION OF THE SENSORS

1. Bumper damage
2. Leaking fluids-oil, power and brake fluid, transmission other fluid.
3. Smoke in vehicle exhaust, startup fumes
4. Warning lights

V. PROPOSED SYSTEM

A. Embedded control to indicate the air pollution

Triggered indication about the service of the vehicle for the person who is using the vehicle will be ensured. Minimal triggered to give a change to service the vehicle. If the trigger crosses the minimum value then automatically the information is transferred to the remote service center, about the improper maintenance of the vehicle and the vehicle gets locked at the place of the last trigger. Fig 1.2 shows the functional block of the proposed system that serves as the backbone to form a node in a network.

Electro chemical sensor

GSH4-7(Gas Sensor Housing type) maximum 4 electrode sensors can be wired. Tamper proof protection helps in reducing the interference to provide better results of measuring gases.

Microcontroller

Atmel AVR XMEGA is the one which has the maximum number of pins used to programming IO, Where the ports are mapped to virtual port.

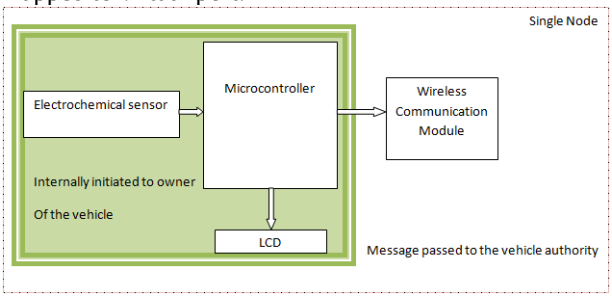

Fig.1.2 Architectural overview

Easy interface to the sensor, LCD and transmitter module, inbuilt crypto algorithm maintain for the transmission. System for direct peripheral-to-peripheral communication and signaling, 100% predictable signal timing with a short and guaranteed response time. It is capable of working both in active mode and idle sleep mode. Reduced power utilization as it can work in sleep mode. Flexible slave address match function helps in easy hardware recognition.

The sensed data in the microcontroller are encoded - IC (HT12E) and send to the controlling unit via the transmitter module TRX -434 RF.

B. Transferring Control to Remote Center

Several concepts and functionality are key enablers for pervasive computing. One example is indoor and outdoor location tracking and positioning. Another is real world modeling and mapping to the physical spaces - what we call self-sensing spaces, spaces that can sense themselves in terms of locating and controlling its contents.

A new platform such as OSGi (Open Services Gateway Initiative) facilitates the installation and operation of multiple services on a single device or gateway (an in-vehicle information system, smart handheld, set-top box, entertainment platform, multimedia or residential gateway). Finally, combining new technologies, like real world modeling and location tracking changes the way remote monitoring is being used.

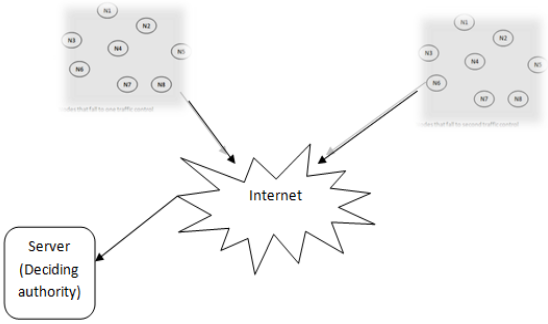

Fig.1.3 Methods of interconnectivity to form a network

VI. CONCLUSION

Serve as self analysis tool for the owner of the vehicle and extended the use to government, for licensing (renewal) and auditing of the vehicle.

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