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E Nose for Identification of Odour Level and Quality of the Food Product

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Abstract: *Food quality is a most essential factor to our day-to-day life. Now-a-days the food quality gets bad due to many food industry waste, food waste mixed into food resources, etc., according to food quality control board statement, lack of food quality monitoring is the key reason for increasing the level of food chemical. In this project, a live monitoring system with customized food sensor are used. Atmega328 microcontroller is utilized for measuring food quality. The sensor values are updated for processing and monitoring through a graphical view. The Proposed system is used to analyze the food samples.*
Keywords: *Electronic nose, gas sensor, embedded kit*

I. Introduction

An electronic nose is a device to odors or flavors. The expression of " electronic sensing " refers to the capability of reproducing human senses using sensor system .since 1982 research has been conducted to developed technologies, similar to as electronic nose ,to detect and recognize odor and flavors. The stage of the recognition process are similar to performed for identification quality monitoring, output display, buzzer and other applications. Over the past decade ,online food quality monitoring has been widely used in many countries know to have serious issues related to food quality and imbalance in food quality would severely affect the health of the humans and also affect the ecological balance among species. In the 21st century there were lots of inventions, but at that time pollution, global warming and so on can causes damage to nose. The food quality is more precious and valuable for all the human beings so the quality of food should be monitored in real time.
The traditional methods of food quality monitor involve the manual collection of food sample from different locations. These food samples tested in the laboratory using the analytical technologies. Such approaches are time consuming and no longer to be considered efficient. Moreover, the current methodologies include analysis of various kinds of parameters of food quality such as physical and chemical. Traditional methods of the water quality detection have the disadvantage like complicated methodology, long waiting time for results, low measurement precision and high cost. Therefore, there is a need for continuous monitoring of food quality parameters in real time. By focusing the above issues, we have to develop and design a low-cost food quality monitoring system that can monitor food quality level in real time

II. Block Diagram

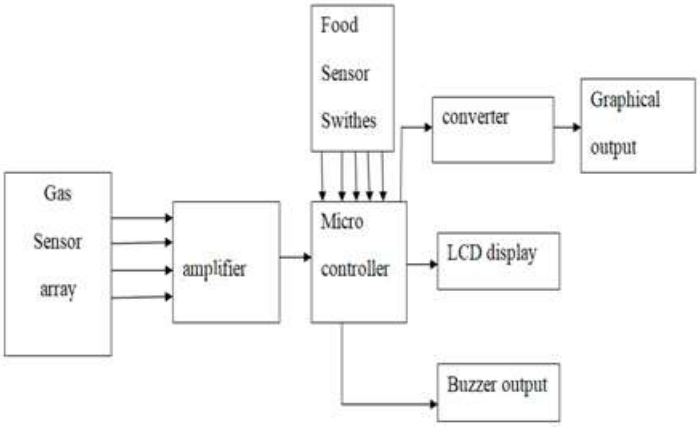

Fig 1: Proposed block diagram

2.2 Description Of Block Diagram

The quality of food provides the healthy condition to human beings and the wealth of ecosystem. In the proposed system, consists of food sensors, LCD display and a buzzer sound interfaced to Atmega328 microcontroller. This measures the physical and chemical characteristics of food resources, it also determines the level of food quality. So, the sensor like MQ4 is customized to find the quality of food and to find the odor of the food, the food sensor convert the signal into milli volt, then it is send to the amplifier ,to amplify the signal. to convert the signal in the form of voltage because the milli vot cannot passend through atmega 328 microcontroller that will transmit the signal to serial port converter to provide the graphical view and it also provides data to LCD and buzzer to show the output. the LCD display and buzzer is provided to show the quality of food to the deaf and dumb people and odor of the food for the anosmia people i.e, people without nose to know the quality and odor of the food sample.

The gathered sensor value are updated lively to display and awareness is intimated to authorities through personal computer and to common people viz., the quality of food can be measured from the sensor which are deployed in the site. each and every second ,the parameter are measured using sensor and value are converted into analog to digital form, through the Atmega328 microcontroller, in built with ADC, once the sensor values crosses the threshold limits of the parameters considered, then the output value shown to the display.

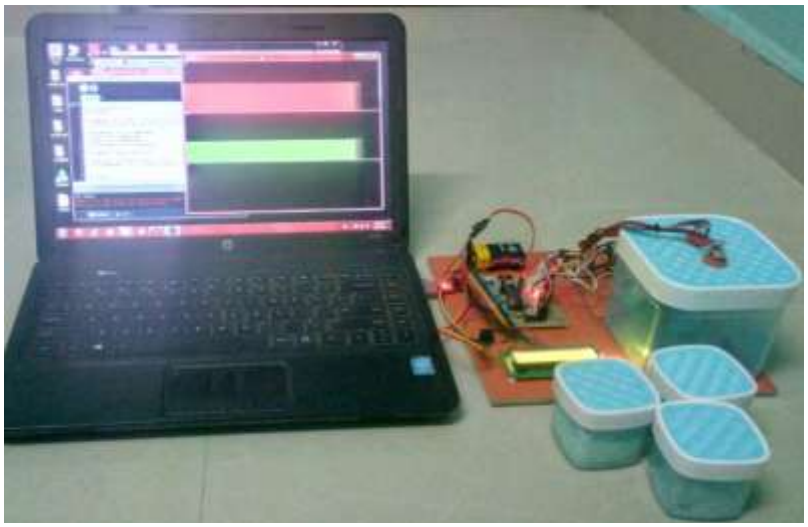

Fig 2: Proposed work

III. Hardware Description

3.1 ATmega328 microcontroller

The Atmel AVRR core combines a rich instruction set with 32 general purpose working registers. All the 32 registers are directly connected to the Arithmetic Logic Unit (ALU), allowing two independent registers to be accessed in a single instruction executed in one clock cycle.

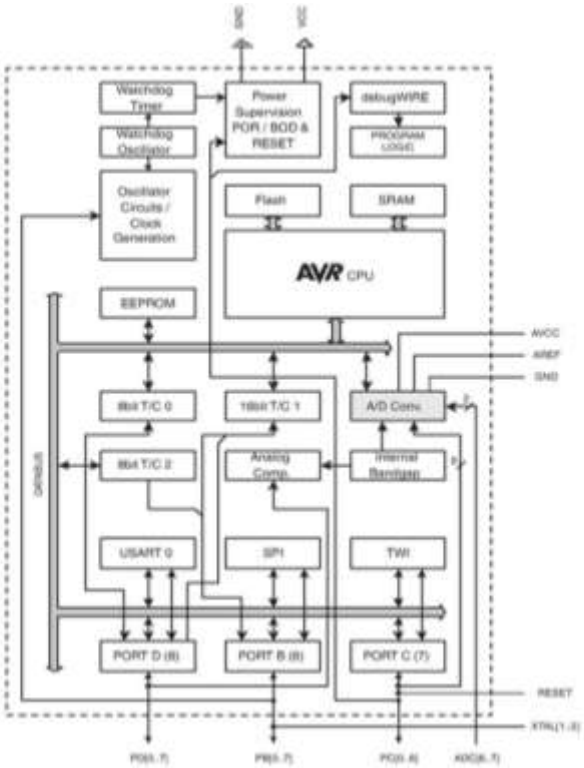

Fig 3: atmega 328 microcontroller

3.2 MQ4 Gas Sensor

Structure and configuration of mq4 gas sensor. sensor composed by micro AL2O3ceramic tube, tin dioxide (sno2) sensitive layer measuring electrode and heater are fixed in to a crust made by plastic and stainless steel net ,the heater provides necessary work conditions for work of sensitive components , the enveloped mq-4 have 6pin ,4 of them are used to fetch signals ,and there 2 are used for providing heating current.

Fig 4: MQ4 gas sensor

3.3 Buzzer

A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric. Active buzzer 5V Rated power can be directly connected to a continuous sound, this section dedicated sensor expansion module and the board in combination, can complete a simple circuit design, to "plug and play.

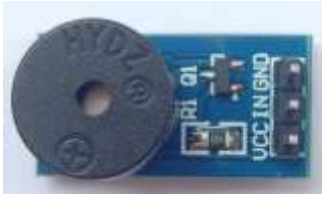

Fig 5: buzzer

IV. Software Description

4.1 Eclipse IDE For Embedded Avr Software

Eclipse based Integrated Development Environment (IDE) for Atmel's AVR microcontroller family. These instructions are Linux-oriented, but they are applicable for other OS platforms as well.

Processing is a Java dialect specifically designed for generating visual art, animation and any kind of graphic application

V. Conclusion

The developed embedded At mega microcontroller e –nose is tested for odor data acquisition. From the experiments it is observed that the e-nose response to orange, rise, milk, curd etc. is different. A marked differences in the data pattern is observed in case of fresh and rotten orange and milk. Preliminary experiments have shown promising results. The next test is to use pattern recognition for odor identification and detection of food freshness and quality. Over all the proposed execution of food quality monitoring system based on graphical and display offering low power utilization and low cost is presented. Another important fact of this system is implantation should be very easy. This method does not require any man power, so both time and power can be saved. This project used for smell disability person to indentify food quality.

5.1 Output

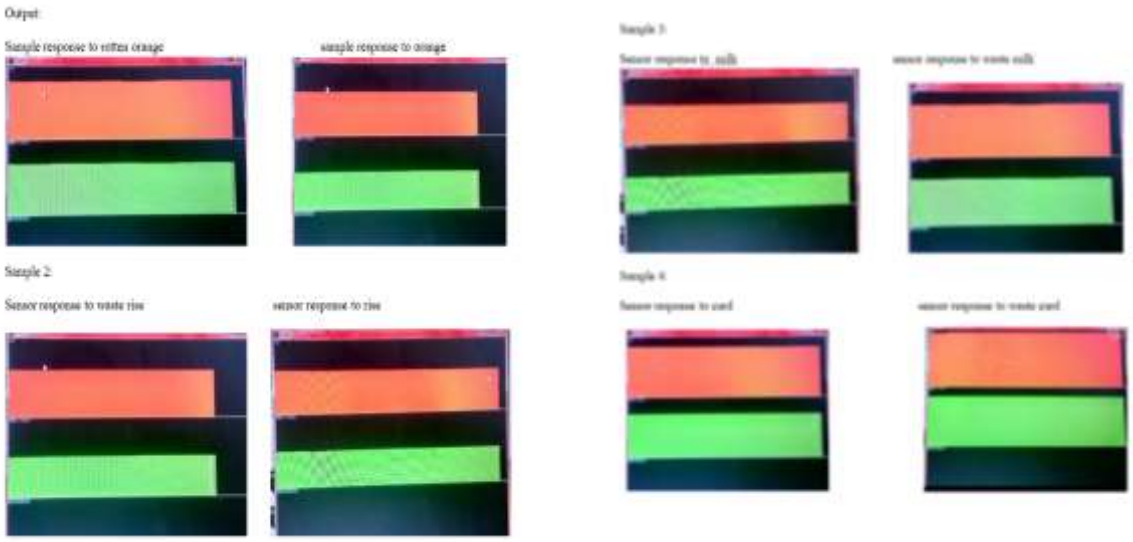

Fig 6: Output

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