

IOT BASED ALCOHOL DETECTION FOR INDUSTRY WORKERS

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ABSTRACT

Nowadays there are so many accidents happening in the industries (Mechanical, chemical) due to the workers who consume alcohol during their work period. In order to prevent and reduce the rate of accidents happening in the industry, there are few preventive measures which have been evolved. Now we use new methods and technology for detecting the alcohol consumption of the worker. For this we use alcohol sensor which is placed along with the biometric attendance system. The workers have to pass the alcohol detection test only then they can able to proceed for their biometric attendance. If the worker does not pass the alcohol detection test then that worker would not be able to register for the biometric attendance system. This alcohol detection system is kept in a room that capable of detecting only one person at a time.

KEYWORDS: - Alcohol detection, Alcohol sensor MQ3, Motor drive, Industry accident prevention.

1. INTRODUCTION

Industry is one of biggest support of the country and also for the worker their family and welfare. The economic status of the India is developing by the help of industries. Some workers are habituated to consume alcohol during their working hours due to that many accidents, traumas and also lead to death many times which is not for good for the workers' health as well as for the industry.

To prevent the accident alcohol sensors are used for checking the concentration of alcohol in an individual. Nowadays, they are mainly used by the traffic police. But we proposed the alcohol detection system in industries to prevent the accidents happening due to the alcohol consumption by the worker.

To check the alcohol concentration, workers have to pass the alcohol detection system. The alcohol sensor is used for calculating the alcohol content. This happens because alcohol doesn't get digested instead it is absorbed by the mouth. Thus, some traces are always left even after several hours of drinking. That traces are detected by the alcohol detecting system.

We implement the project of alcohol detection for industrial workers. The worker will be checked while entering into the industry. After the checking process then only, the worker will be entering into the industry. If the worker detected in the alcohol detecting system, that worker would not be allowed for the work on that particular day.

2. LITERATURE SURVEY

The existing system should detect the drunken drivers. If the driver has drunken the car engine would not start and it will send an alert message to the family members. The existing important research papers we used to refer about similar projects to implement a new technology.

In this paper author describes the alcohol detection for vehicle system. In worldwide so

Many drunken drivers are driving there that results so many accidents [1]. In this paper they have used an alcohol detecting sensor which will detects alcohol gases and a notification message continuously to the friends and relatives. In this process microcontroller is connected into the engine with GSM and GPS modules. GPS module is used to locate the position of vehicle with latitude and longitude then it sends the messages via GSM to the relatives of the driver. This system prevents accidents with the help of ultrasonic sensor.

The author has proposed a method to detect alcohol sensor will be fixed into the car and it will detect the drunken person into the car. If the drunken person had detected the car engine would not start .the major disadvantage of this system is it will detect all the person into the car instead of the driver [2].the system has alcohol sensor fixed into the steering of the car if the driver starts the car, the sensor will measures the content of the alcohol in drivers breathe and automatically switch of the car if alcohol is detected. This system the sensor will measure the alcohol content from zero to



To very high concentration. The threshold, relay cut off automatically and the buzzer will produce the sound automatically.

This study focuses on continuous detection of the driver's current state using alcohol detection sensor MQ3. A driver is given an alert as soon as symptoms of drowsiness are detected. This can be done by using an alarm or by fixing a vibrator in driver's seat. Alcohol consumed can be detecting using sensor. The disadvantage of this system is it will take much time to detect and the result will not accurate [3].

In this study the device quickly senses the drunken state of driver by estimation of breath alcohol concentration level and the eye blink. After detection siren is activated to warn the persons on road. GSM and GPS also fixed into the system. If the device detected the drunken driver an alert message will be sent to the family members [4]. the project is realized interfacing the ATMEGA 328 microcontroller with sim 808 GSM, GPS module, RFID and various sensors.

In this case study the MQ3 alcohol sensor will be fixed into the steering to detect the drunken driver. The main disadvantage of this system is if the driver wears a mask or kerchief his mouth the amount of breathes exhaled will not be enough to sense [5].in this system they can used microcontroller interfaced with an alcohol sensor along with a buzzer ad DC motor. If the driven is drunk the car will automatically control the speed and lock the engine.

3. PROPOSED SYSTEM

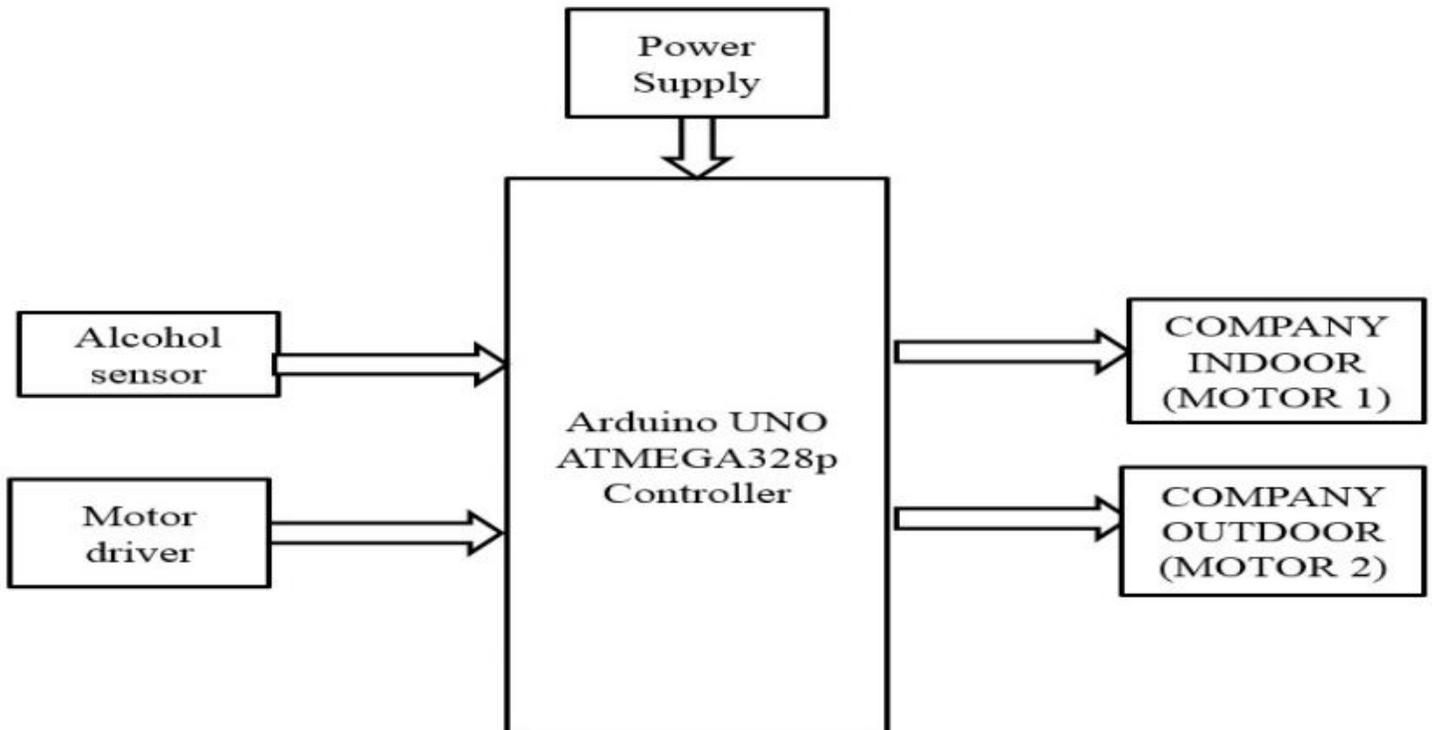
The method and technology used in this system is by installing the alcohol detecting system in a room. For this we use alcohol sensor which is placed along with the biometric attendance system. The workers have to pass the alcohol detection test then only they can able to proceed for their biometric attendance. If the worker does not pass the alcohol detection test then that worker would not be able to register for the biometric attendance system.

This alcohol detection system is kept in a room that capable of detecting only one person at a time. The alcohol system approximately takes up to 5 - 10 seconds to detect and display the level of alcohol consumption.

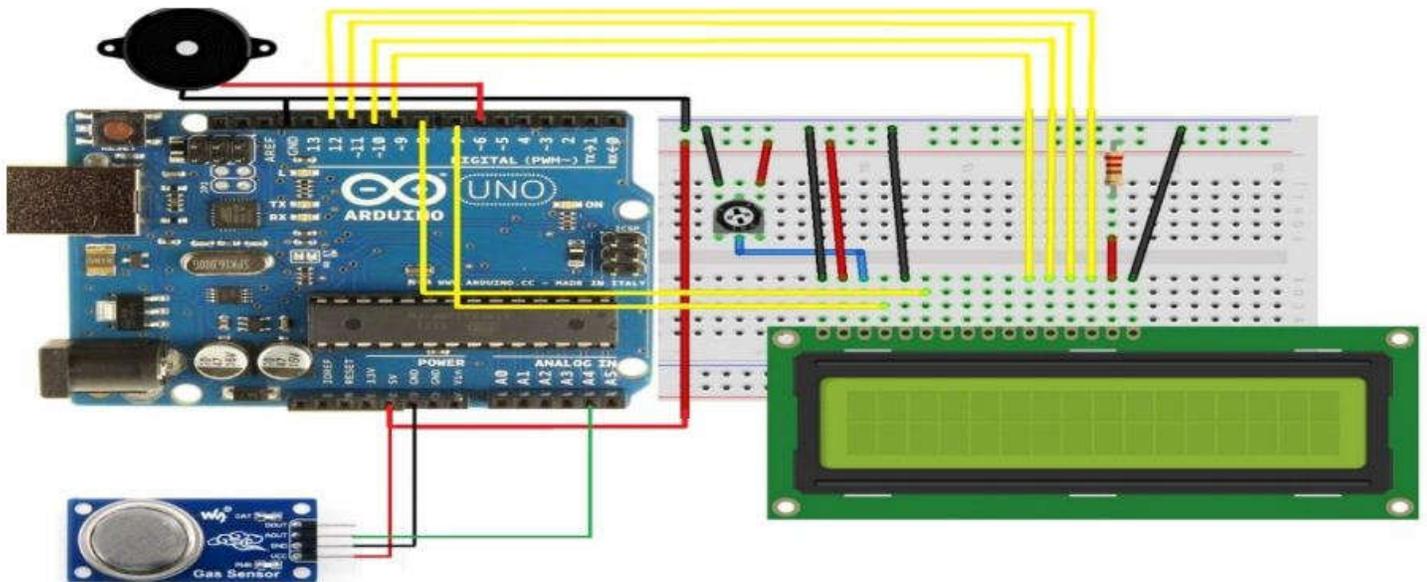
Components Required:

- Arduino Uno Microcontroller.
- Alcohol sensor MQ3.
- Gear motor 12v 300rpm
- Batteries.
- Motor driver.
- Bread Board and Connecting Wires.
- Buzzer.
- LCD display.

System Architecture:



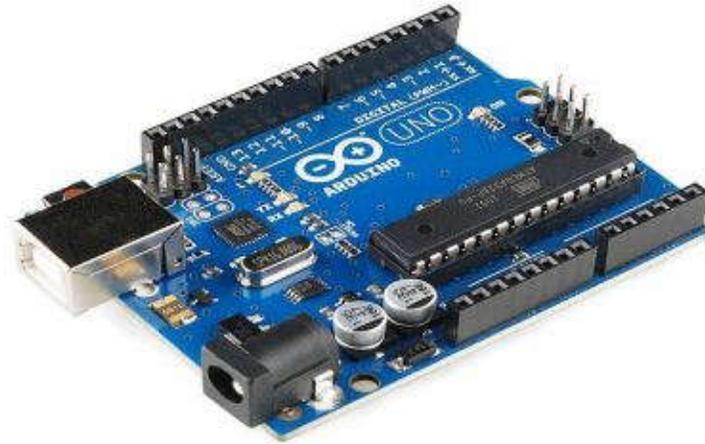
Circuit Diagram:



Here we are using Arduino UNO board and us connecting the Alcohol mq3 sensor analog data pin in A0. If the sensor detects the alcohol then it sends the data to the Arduino board. Arduino gives the high signal to the first motor positive which was connected in the Arduino board digital pin 3 and gives the low signal to the motor negative which was connected in the Arduino board digital pin4, it was processed for open the main door. Second motor is attached with the second door it was run when the alcohol sensor doesn't send the high signal.

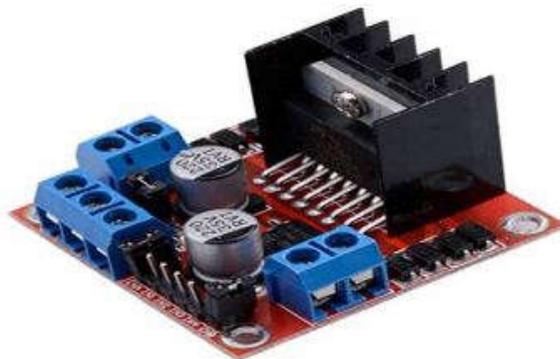
The second motor positive was connected in the Arduino board digital pin 5 negative was connected in the Arduino board digital pin 5 it was runs. Then one buzzer was blow when the alcohol sensor sends high signal. Here the motor driver was runs in both clockwise and anticlockwise direction it was done by using l298d driver.

Arduino uno:



The Arduino UNO is an open-source microcontroller board. It is totally based on the microchip ATmega328P microcontroller. It was developed by Arduino.cc. The board is fully equipped with digital and analog input/output (I/O) pins that may be interfaced to various expansion boards (shields) and other circuits. The Arduino board contains 14 Digital pins, 6 Analog pins, and it will be programmable with the Arduino IDE (Integrated Development Environment) software via a type B USB cable. The USB cable can be powered by an external 9-volt battery, though it accepts voltages between 7 and 20 volts. This is similar to the Arduino Nano and Leonardo.

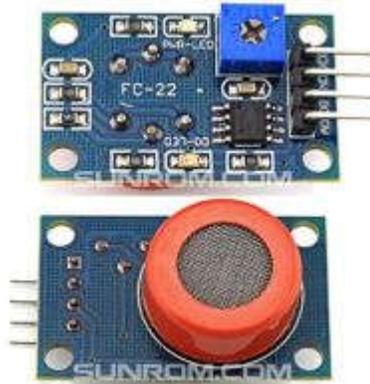
Motor driver:



Most of the microcontrollers operate on very low voltage (5V) and current while the motors require higher voltages and current so, the microcontrollers would not provide that much of higher current. For that purpose, we will use motor driver ICs. We simply call a motor driver a little current amplifier. It will take a low current signal and give out a high current signal which can drive a motor. It can also be used to control the direction of the motor.

Motor drives are of many kinds depending upon the maximum supply voltage, maximum output current, rated power dissipation, load voltage and number outputs etc. in this project we are using the motor driver L298N.

Alcohol Sensor:



An alcohol sensor which is used to detect the alcohol gas in the air and an analog voltage is an output reading. This sensor can activate at temperature range is from -10 to 50° C with a power supply is less than 150 Ma to 5V. This sensor sensing range is from 0.04 mg/L to 4 mg/L, it is most probably suitable for breath analyzers.

Advantages:

- Easy installation.
- Low maintenance.
- Compact elegant design.
- It detects the drunken workers.
- Avoid accidents in industries.
- It Consumes very little amount of energy, ideal for continuous operation.

4. COMPARISON OF EXISTING WORK WITH THE PROPOSED WORK:

Who and when	Technique	Advantage	Open issues
Savania, V., Agravata, & Patela, D. (2015)	The main approach is detecting the drunken driver by using alcohol sensor (MQ135), they detect the driver whether e/she is drunken or not. If his is drunk send notification to the relatives.	<ul style="list-style-type: none"> • We can easily find out the car location. • Message will be sent to the particular relatives. 	<ul style="list-style-type: none"> • It is not cost effective. • Alcohol sensor MQ135 is outdated.
James, N., & John, T. P. (2014).	The alcohol sensor is fixed onto the car steering. If the driver starts the car the sensor will measures the alcohol content in his breathe.	<ul style="list-style-type: none"> • If the driver is drunken it will automatically switch off the car engine. 	<ul style="list-style-type: none"> • If driver will be masked by kerchief it will not give the accurate result.
Mohamad, M. H., Hasanuddin, M. A. B., & Ramli, M. H. B. (2013).	The alcohol sensor MQ3 is embedded on the car steering. The ignition system circuit is used to on off the car engine	<ul style="list-style-type: none"> • The ignition system is the only advantage In this paper. 	<ul style="list-style-type: none"> • If the spark plug will not work the car engine could not start.
Hatekar, M. A., Bajaj, H., Nayar, N., & Parab, S. (2018).	The alcohol sensor and eye blink sensor can be used to detect the driver drowsiness level. by using the drowsiness level we will find out the alcohol level.	<ul style="list-style-type: none"> • The main advantage is if the driver is drunken it will a message to relatives. • Gps also fixed into the system to find the location 	<ul style="list-style-type: none"> • In this paper they would not mention where the eye blink sensor will be fixed
Chavan, A., Pashte, T., Shah, B., Shah, D., & Shinde, M. P. (2018).	The micro controller is interfaced with alcohol sensor and DC motor. if the driver is drunken message will be sent to relatives. If they permit then only the car engine will start.	<ul style="list-style-type: none"> • The advantage of this system is we can track the location if driver is drunken. • The owner or supervisor can override the system by an authorized sms reply. 	<ul style="list-style-type: none"> • If there is a chance to another person has drunken the car engine could not start.

CONCLUSION

The complete analysis of this project will be implemented by using hardware components are shown above. This system completely serves as a prevention and safeguard for the workers as well as the industry. The future scope of the proposed system is used to implement in industries, offices, university, etc. Also planning to add the Microwaves signal detector to restrict the workers bringing the mobile phones.

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