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INTELLEGENT HELMET USING BLUETOOTH

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ABSTRACT

In this papera smart working helmet using bluetoothstereo transmitter has been designed and tested. This has been developed with an idea of using some of the comfortable aspects to the customer in lieu with instrumentation technologies. In this model there are three major parameters are included which will be a major imperative ideas to be installed. Helmet which is accompanied with technologies on FUEL, SPEED, TEMPERATURE indicating systems, in which every customers need to be aware of his or her own vehicles. On future based vehicles, these implantation play a vital role for the next generation society knowing that these technologies will help them to look after their own safety to both the vehicle and to them.

KEYWORDS:Microcontroller, Voice Bank Circuit, Bluetooth Transmitter & Receiver.

I. INTRODUCTION

Usage of Helmet is a Very good Habit for those who are known its Characteristics. These are given only physically to it till date. Further the main model of this design gives the characteristics of the helmet not physically but also technically. Now a days accidents are held frequently, in order to reduce the previous we've done a smart hel met which will be user friendly and security purpose will be high. This idea can be added in military uniforms and defence research and development organization (DRDO) for our national security.

Previously used helmets possess protection just for the Cranium. Further invention includes an ordinary glass in which drawback is occurred when the night time seeing is restricted and easily gets broken To overcome this Kevlon or Carbon fibre glass material will introduced with full faced anti glaring property.

Jennifer William [1] et al. proposed system in which the Intelligent Helmet ensures the safety of the rider by making it necessary to wear the helmet and assure that rider hasn't consume any alcohol while driving the vehicle. The system also help in efficient handling of aftermath of accident by sending a SMS with the location of the rider to his/her well-wisher's number to get proper and prompt medical attention, after meeting with an accident.

MukundalaSai Rohit[2] et al. Said Rohit described in the paper Alcohol detection, Ignition of the engine only after wearing the Helmet and Theft control system that the alcohol sensor senses the conductivity. Depending upon the conductivity level whether low or high. If the performance if conductivity is high it gives the signal to the output and the engine cannot be started meaning the rider has consumed alcohol. Another parameter includes the anti-theft control system which is determined with the help of Face recognition system accompanied by 2 IR sensors for sensing the real owner of the bike.

S.Shabina [3]is proposed for ensuring the safety of the mining workers. The mining workers possess helmet in their head which is built by RF transmitter .The RF receiver is the controller room. Wireless Sensor Network (WSN) technology is built at different places in the mining areas. If any landslides and leakage of hazardous gases occurs the signal will be sent from the worker's helmet to the controller room. This technology can help mining workers from danger.

B.Devi [4] et al. proposed in the paper Voice Alert for Accident Avoidance on Merging Lanes, Blind Curves And T Junctions that the obstacles in the environment are detected by Ultrasonic sensor. The output is generated by a Voice indication module ISD 10.When the rider is unaware of any obstacles like speed breaker, divider, U turn etc. are indicated by a voice command.

Marcus Weller [5] et al. has invented in the Skully Helmets Inc. about many instrumentation technologies for the rider to be fully aware of the environmental conditions. These are about heads up display, Look ahead mirror, Blind spot camera and output audio connection. These output commands are given by Smart voices by attaining the features in Fenix Ar smart. These audio and visual navigation is been constantly monitored and

reported. Speaking of the audio quality matches with thumping speakers with crystal clear call quality.

Albert Daimary [6] et al. proposed in the paper Low power intelligent helmet system, consist of 2 concepts. The first one based on alcohol sensing and the latter is about Wearing of the helmet to start an engine. They have designed an alcohol sensor and some sensitive switches, which is connected wirelessly inside the helmet. The power given to the helmet is either by manually charged solar panel or by a lithium ion battery. It has been produced in such a way that the circuit related to alcohol detection is Shut OFF after a pro longed time automatically.

ParulNagarkar[7] et al. purpose in the paper Intelligent Helmet Band, riding of motorcycles which have been implemented with GSM and GPS tracking technologies with limit switches. These switches are placed to detect if the rider has worn the helmet or not. After analyzing the result the ignition starts. The accelerometer have been used her will acquire the signal and sends a message alerting the perfect location of the accident using GSM and GPS.

II. PROBLEM IDENTIFICATION

Context oriented display inside your helmet (virtual display) which means only relevant data is displayed when it is needed, maintaining your focus on the road only. This project was converted from visual display to audio, because distraction, initial cost, replacement cost, special glass material is required. The sequential occurrence of the error has not been ordered yet, solution to this above needs to be determined.

III. PROPOSED SYSTEM DESIGN

Microcontroller: - We have used here consists of 40 pins and 4 ports namely PORT-A, PORT-B, PORT-C & PORT-D. Out of which PORT-A is been allocated for A/D Conversion purpose and remaining PORTS acts as a Bidirectional Input/output PORT.The transmitter and receiver part in the prototype possess Microcontroller. Keil software is been used her to upload the program. Using program dumper these programmed codes are installed in the embedded system. Transmitter part microcontroller possess comparative technology by comparing set point of expected and actual logic status. These logic status triggers the receiver part microcontroller and generates the recorded Vocal output.

Voice bank circuit:It consists of 28 pin IC configuration. Out of which, 8 pins are allocated only for voice recording. Each pin has the capacity for storing 90 seconds of voice, but here we used only 3 pins each consisting of only 5 to 10 seconds voice recorded in it. We have used here is apr33A in a reason for choosing this particular IC is of two reasons. First one is regarding of clarity of output voice and the second thing is mainly it is very economical. Since the main output of the prototype comes as Vocal commands these are maintained at a Crystal Clear Quality. Another important feature of this voice bank set up power supply is very low and there's no need of any large power supplying unit.

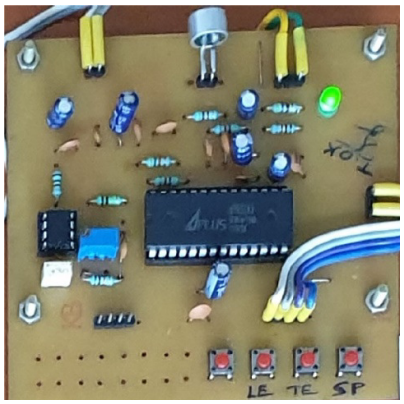


Figure 1: Voice bank circuit

Speed sensing Circuit: Initially the circuit design was initiated to check the desired output can be determined or not. In order to denote the speed sense a 1000 rpm motor (servo) is introduced in the prototype. To check the corresponding rotation of the motor MOC781 also called as u-slot sensor is used. The working of this Sensor includes Infra-Red light source in port and photo detector in another port. Whenever there is a flex is being cut or passed through the U-slot it takes a count of pulse and each instances of time. The motor's rotation at each pulse is indicated by blinking of an LED bulb. (If the LED glows a pulse is generated). Further on implementing the whole experimentalprocess in the prototype NAND gate 4093 is used to generate the pulse to the Microcontroller.

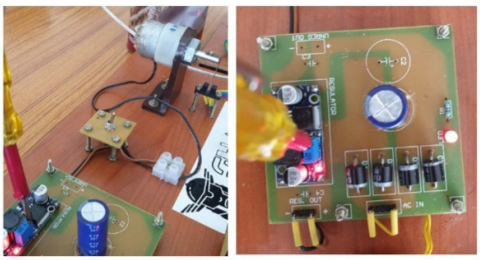


Figure 2: Speed Sensing Circuit

Fuel level sensing: Fuel level indication sensor are primitive sensors used in vehicles which has a major drawback in it. When there is a case of using Two electrodes, the liquid and the sensor gets combined and forms an electrolytic reaction and the sensors gets corroded. So therefore there is a loss in effectiveness of the sensors and needs to be changed attimes.Toovercome that, previously DC potentiometric sensor are used and now in modern

terms AC Potentiometric sensor is been used this has advantage of constant reversal of electrodes polarity since it is an AC type it keeps on changing, therefore the electrolytic process and corrosion cannot happen. In this model there are 2 sensors used denoting low and high. The sensed values of these 2 sensors are sent to a NAND gate logic. This logic consists of 4 assumptions. High-High High-Low Low-High Low-Low.(Here High (0) and Low (1) denotes the level of the sensor). So therefore the Vocal command is generated only for the last assumption therefore both the sensors is at a low level, meaning the fuel level is very low. The program is designed in such a way that the voice command is given only for the low level case.

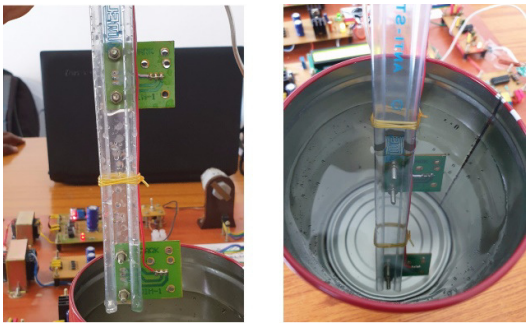


Figure 3: Level Sensing Circuit

Temperature Sensing :Temperature Sensing circuit is used in order to denote the condition of the engine when itsover heated. When this condition(over heated) occurs , the engine get ceased. Therefore in this circuit, LM35 sensor is built with the set point level is installed for a threshold condition range of temperature is from -55^{o}c to 150^{o}c but the set point level given in the prototype is 500c but it depends on the user in the above (fig-4) circuit explains the working of temperature sensing. Once the above set point is reached, the LM35 sensor senses the temperature of the engine and sends the signal to the microcontroller.

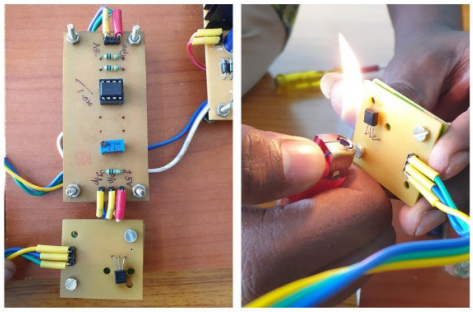


Figure 4: Temperature Sensing Circuit

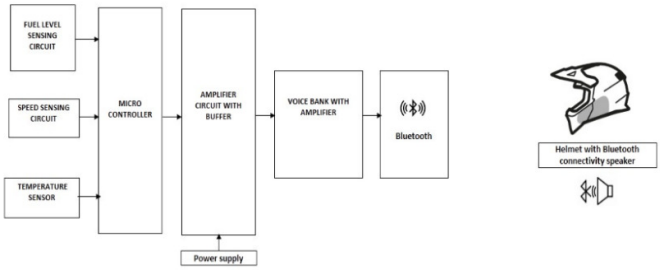
Bluetooth Transmitter: The Microcontroller works upon the predefined program and generate the signal to the voice Bank circuit apr-33A. The Voice bank circuit analyses the programmed coding and sends it to Bluetooth Stereo Transmitter (BST). It takes the transmitter signal to the Bluetooth stereo receiver such as speaker or headphones . The output is fed out in terms of Vocal alertness.

Figure 5: Block diagram of Smart helmet

IV. SYSTEM ARCHITECTURE

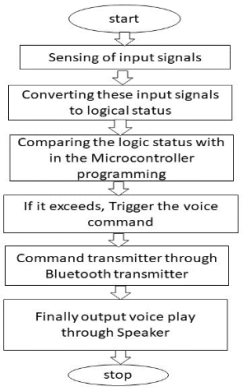
The block diagram consists of fuel, speed and Temperature sensors. Each sensors are connected tothe microcontroller unit. Initially out of three sensors, fuel level sensor is triggered first followed by the speed, and temperature sensors. The Microcontroller receives the signal from the above sensors are processed with a predefined set point and programming codes. These signal are then send to amplifier circuit for amplification of the signals followed by a buffer circuit. The buffer circuit helps in allocation of those 3 sensed signals one by one in order to avoid collision and overcrowding.The signal is then sent to the voice bank circuit where it stores the data in a voice alerting format . The Bluetooth stereo transmitter and receiver receives the vocal commands and it is heard with the help of speaker or head phones etc.

Figure 6: Block diagram of Smart helmet



V. PROCESS FLOW

The flow chart represents the following steps are (fig.7). Sensing of input signal from each sensors explained earlier. Converting those sensing input signals to Logical status using a Comparator. Comparing the correspondent values of each sensors to the predefined set point values in the Microcontroller. Triggering of a Voice command when the experimental values is beyond the set point values. Transforming of the Voice command to Speaker or Headphones via the Blue tooth



Transmitter and receiver.

Figure 7: Block diagram of Smart helmet

VI. RESULTS & OBSERVATION

Speed Control Circuit Design has been tested with MOC7811 with an IR sensor, itconverts Mechanical rotation into Logical status. Initially with the help of an LED the rotation of motor has been determined with a help of blinking. The speed sensing parameter is achieved with the predefined set point value (750 rpm).Once the Set point is achieved the output is generated by a voice alerting mechanism.The Power supply for the sensor, the range between 3.3 to 5v and for the motor (1000rpm-Gear motor) is up to 12v. The corresponding output generated is based upon our set point (RPM) has been tested and result is verified.

The Fuel level sensing circuit has been tested with IC 4093 consists of the two electrode denoting low level and high level signal. These two signal connected to a NAND gate logic. These logical output has been analyzed correspondingto the detection of two electrodes. If the condition satisfied for any one electrode, the indication of fuel level is attained if not the electrode doesn't sense the fuel level (no voice indication). This condition has been tested and verified.

Temperature sensor used here is LM 35 and operating range is 4v-20v with respect to amount of heat observed by the above the sensor. The Expected output is compared with the help of Set point (Degree Celsius) Values. The out coming results are in the range from -55 `c to 150 `c .The performance of the given sensor has been tested and verified.

The prototype was tested and found to deliver satisfactory reports these technologies will them to look after their own safety to both the vehicle and to them.

VII. CONCLUSION

The proto type has been designed, processed, and perfectly executed for the comfortableness of his/her safety precautions. Until then it's Shako saving you not just from one step, but three steps from danger.

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