Smart HUD Helmet

[1]Mohammed Taha, [2]Syed Munawwar Shareef Ahmed, [3]Sabera Aziz, [4]Dr. Mohd Abdul Bari

[1] *BE Student, Dept. of Computer Science Engineering, ISL Engineering College,*
[2] *BE Student, Dept. of Computer Science Engineering, ISL Engineering College,*
[3] *BE Student, Dept. of Computer Science Engineering, ISL Engineering College,*
[4] *Professor & HOD, Dept. of Computer Science Engineering, ISL Engineering* College,
Hyderabad, India.

Abstract: A Smart Helmet is protective and advanced headgear which not only protects the rider but also provides modern features which helps in concentrate on riding. Systems like Heads up Display (HUD)/Augmented Reality overlay are used to. Superimpose information onto a field of view These systems have the capability to reflect projected digital images as well as allow the user to see through it or see better with it. It may support wireless technologies like Bluetooth, Wi-Fi, and GPS. Few models run a mobile operating system and function as portable media players to send audio and video files to the user via a Bluetooth or Wi-Fi headset. The Smart helmet also protects the driver this can be implemented by using advanced features like accident identification, location tracking, use as a hands-free device, fall detection. In case of an accident, it will send a message through GSM along with location with the help of GPS module. The distinctive utility of project is fall detection; if the rider falls from the bike, it sends a message.

IndexTerms **- Smart helmet,Arduino based notification glass,Heads up display,Arduino based Bluetooth smart helmet,HUD helmet,GPS module,GSM.**

I. INTRODUCTION

The role of technology in people's life has shown a tremendous increase over the past decade thus making developers experiment more and provide advanced features and creative solutions to many problems. One such solution is the Smart Helmet consists of features like Heads up Display (HUD) which is a Smart glass, and it will be used to send notifications of calls and messages received on mobile phones, and also show time and date, all in front of rider's eye.

II. RELATED WORK

The primary focus of the existing helmets is to ensure the safety of the rider. Some of the features that exists in smart helmets are Alcohol sensation, Force Sensation etc.., To check if the bikers is wearing the helmet or not a force sensation resistor is used and Alcohol sensors are used to check if the person has consumed alcohol. These smart helmets also keep track of the riders activities and keeps them saved in the cloud making the use of IOT. Sensors like GSM and GPS are provided already. These smart helmets are used to prevent any road mishaps rather than providing any advanced features to the rider. As this is one of most crucial aspect there are many research papers are already made to improvise the situation by providing solutions and measures to avoid road accidents and save people's lives. Many different problems of accidents are being solved with these smart helmets.

III. EXISTING SYSTEM

The primary focus of the existing helmets is to ensure the safety of the rider. Some of the features that exists in smart helmets are Alcohol sensation, Force Sensation etc.., To check if the bikers is wearing the helmet or not a force sensation resistor is used and Alcohol sensors are used to check if the person has consumed alcohol. These smart helmets also keep track of the riders' activities and keeps them saved in the cloud making the use of IOT. Sensors like GSM and GPS are provided already. These smart helmets are used to prevent any road mishaps rather than providing any advanced features to the rider. As this is one of most crucial aspect there are many research papers are already made to improvise the situation by providing solutions and measures to avoid road accidents and save people's lives. Many different problems of accidents are being solved with these smart helmets.

IV. PROPOSED SYSTEM

Our Aim is to come up with a kind of smart helmet which primarily focuses on making it is easier for the people who drive for long hours to receive calls, receive messages and do other activities on their mobile without getting interrupted while they drive.
Here we make use of an OLED screen which displays the information received from their mobile, OLED screen is basically a flashlight emission technology. when a series of organic thin films which are in between the two
conductors when there is the application of electric field the light will be obtained, and this OLED emits display transparent OLED is used in front of display screens such as in airplanes which displays the information on the screen.

4.1 COMPONENTS

1. **Arduino UNO**: It is a microcontroller board based on the ATmega328P (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator (CSTCE16M0V53-R0), a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.

Fig 1: Arduino UNO

2. HC05 Bluetooth Module: The HC-05 has two operating modes, one is the Data mode in which it can send and receive data from other Bluetooth devices and the other is the AT Command mode where the default device settings can be changed. We can operate the device in either of these two modes by using the key pin as explained in the pin description.
It is very easy to pair the HC-05 module with microcontrollers because it operates using the Serial Port Protocol (SPP). Simply power the module with +5V and connect the Rx pin of the module to the Tx of MCU and Tx pin of module to Rx of MCU as shown in the figure

Fig 2: HC-05 Bluetooth Module

3. OLED Display: OLED (Organic Light Emitting Diodes) is a flat light emitting technology, made by placing a series of organic thin films between two conductors. When electrical current is applied, a bright light is emitted. OLEDs are emissive displays that do not require a backlight and so are thinner and more efficient than LCD displays.

Fig 3: OLED Display

4. Prism (HUD):

The smart helmet has this Prism right in front of the user's eye, so that the Display will be having it's reflection on this Prism without blocking the user's eye on the road.

All Notifications and Messages displayed on the OLED display further reflects to this prism.

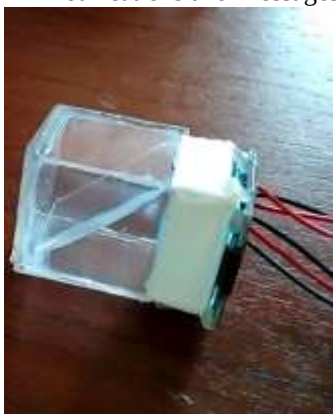

Fig 5: PRISM

5. Android App: Smart Helmet is an Android App which is connects Smart HUD Helmet via Bluetooth (HC-05) Module. With the permissions given of Notification Access.

This app can emit the Notifications, Present Time, and other various options to the Smart HUD Helmet device. This app is written in Android Java with the help of Android studio and have wide compatibility to all the devices.

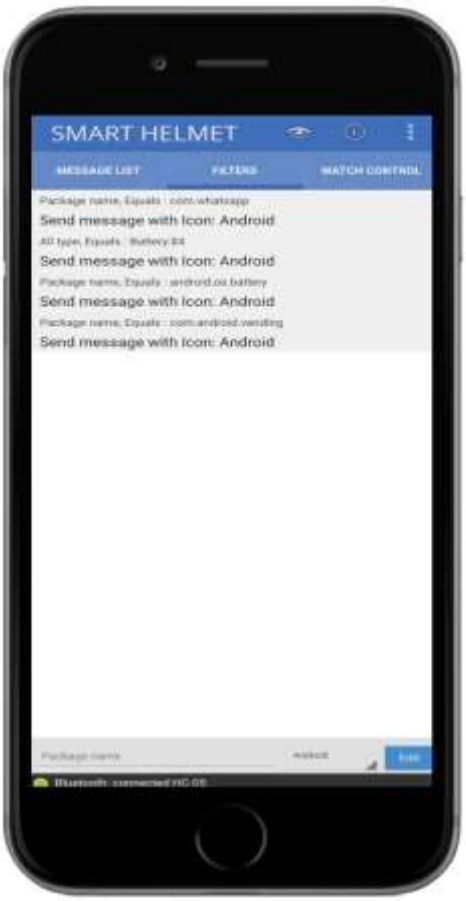

Fig 4: Android-Smart Helmet App

V. WORKING

An Arduino micro-controller with an ATmega328p microprocessor that has been configured to communicate with smartphones through a smartphone application. The ATmega328p is connected to a Bluetooth module called HC-05. is a device that connects to smart phones. The power supply for Smart-Glass is a 5V battery or rechargeable battery. The ATmega328 is connected to an SSD1306, 0.96" OLED display., which is used to connect to mobile devices. The power supply for Smart-Glass is a 5V battery or rechargeable battery.

The SSD1306, a 0.96" OLED display, is connected to an ATmega328p microcontroller.

A smart-phone application is used to send data from the phone, such as the date, time, phone call notifications, and text messages.

The following are the essential steps that are followed during the entire procedure:

1. Receipt of Notifications
2. The coding processes.
3. Sending and receiving data.
4. Process and decode
5. Implementation

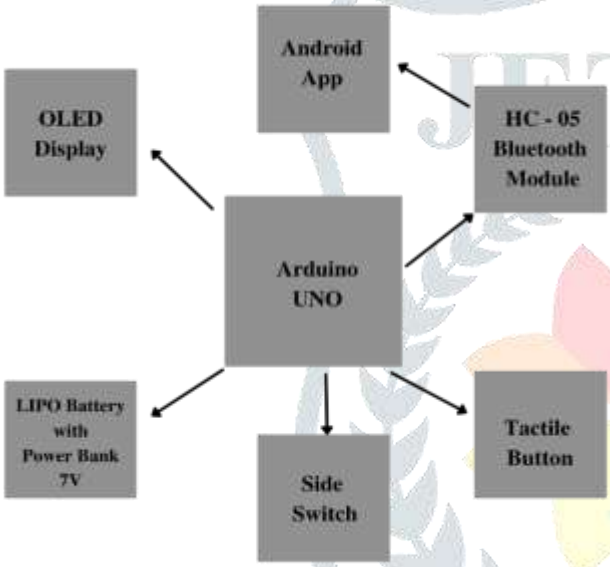

Fig 6: Block Diagram

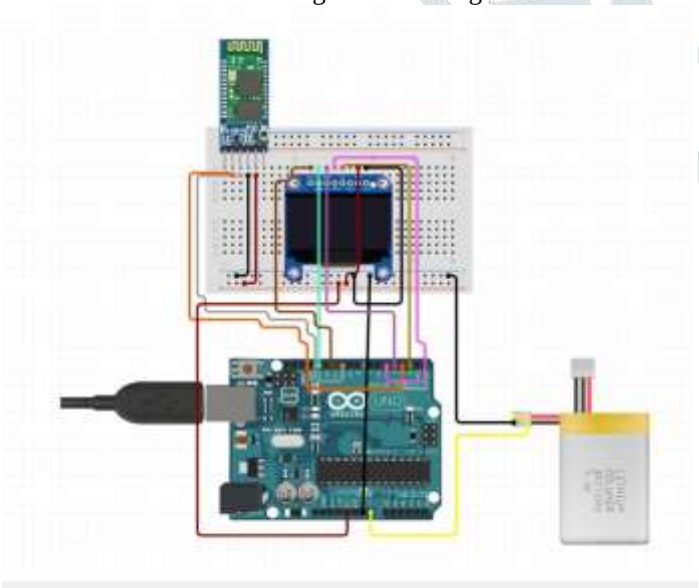

Fig 6: Circuit connections

VI. RESULT

Experimental results

Fig 8.1: Working Model

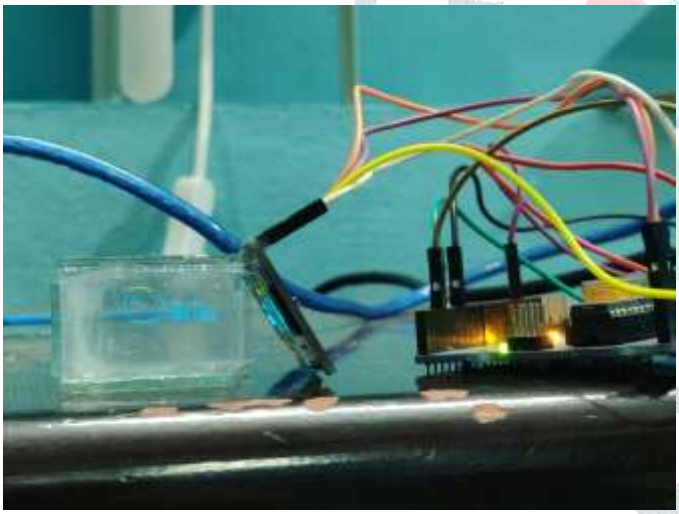

Fig 8.2: Prism Hologram Component View

Fig 8.3: Component view of the final design system

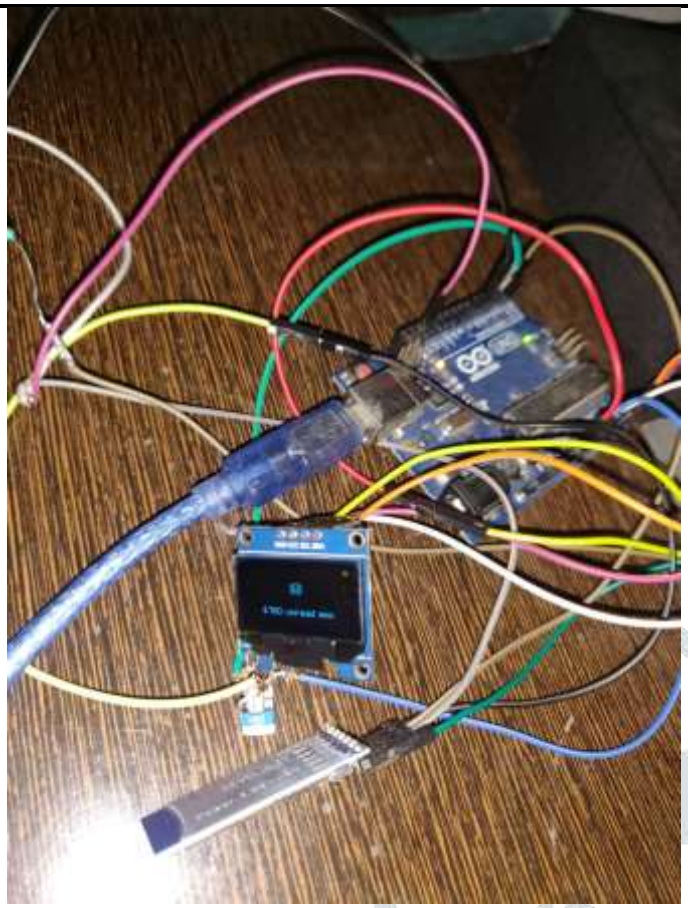

Fig 8.4: Notifications and Circuit Working View

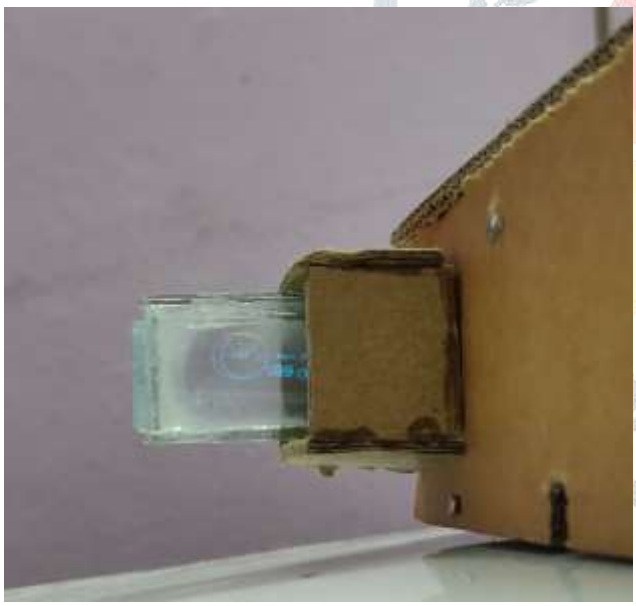

Fig 8.5: Component View of Working Module

VII. FUTURE SCOPE

This smart helmet can be enhanced in the future with more safety features and technology like Force Sensation resister (FSR), Alcohol detecting sensors, Fall Detecting sensors, Maps in display, Calling Functionality.

The Smart helmet can also be paired up with Wi-Fi/Bluetooth for easy accessibility for the rider.

Further, this prototype can be compressed up to 90% by printing custom PCI boards to match with the following concept,

Concept by JDI Helmets

VIII. CONCLUSION

The system generates good outcomes. Basic alerts like as SMS, time, date, and information on the phone's sim card are sent to the display unit by the system. Looping indefinitely This technology is housed in a 3D casing that fits over any helmet and can be carried anywhere

Following that, one may see the date, time, cellular provider, and text message

REFERENCES

[1] M Alain Mauler - Arduino Data Glasses 2016

[2] Massimo Banzi and Michael Shiloh - Getting Started with Arduino - 3rd by Maker India Publication

[3] Brian L. Due - The future of smart glasses: An essay about challenges and possibilities with smart glasses 2014

[4] Wearable Computing: A First Step Toward Personal Imaging, IEEE Computer, Vol. 30

AUTHOR'S PROFILE

Mohammed Taha
BE Student in Computer Science from **ISL Engineering College**,
Hyderabad

Syed Munawwar Shareef Ahmed
BE Student in Computer Science from **ISL Engineering College**,
Hyderabad

Sabera Aziz
BE Student in Computer Science from **ISL Engineering College**,
Hyderabad

Dr. Mohd Abdul Bari
Professor & HOD,
Department of Computer Science, **ISL Engineering College**,
Hyderabad