IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 3, Issue 3, April 2023
Impact Factor: 7.301

Arduino Smart Glasses Augmented Reality Headsets

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Abstract: *Smart or smart glasses are wearable smart glasses that add information to the user's sight. Similarly, smart glasses are sometimes defined as wearing computer glasses that can change their optical properties while they are running. Smart glasses, designed to change the colour of electricity, are an example of the latter's smart glasses. Information is superimposed on the field of view of an optical head-mounted display (OHMD) or transparent head-up display (HUD) or embedded wireless glasses with augmented reality (AR) coating. These systems have mirrored digital images and allow users to see through them or use them to see better. While earlier models could handle simple tasks like pre-ordering the remote control, when it comes to smart glasses using cellular technology or Wi-Fi, Modern smart glasses are computers that can work alone. mobile requests Some are hands-free and can communicate with the Internet through the natural language, while others use touch buttons. Like other computers, Mirrors can collect data from an internal or external device. can check or store information from other devices or computers. It also supports wireless technologies such as Bluetooth, Wi-Fi, and GPS. A few models run mobile operating systems and function as portable media players, sending audio and video data to the user via Bluetooth or Wi-Fi headset. Some eyewear models also have full lifetime access and activity tracker functionality. Smart Glasses can also work like smartphone.*

Keywords: Arduino, Augmented Reality, Smart Glasses.

I. INTRODUCTION

Due to the rapid development of technology and its integration into every aspect of human life, designers and manufacturers are trying to provide people with a better experience. One of the technological trends aimed at making life easier is computing. Wearable's mission is to help people manage their lives by improving real life with ever-increasing knowledge. One of the growing trends in wearables is head-mounted displays (HMDs) because the head is an important way of getting auditory, visual and information. The equipment is useful for people of all types, including the disabled. In this project, we will make a wearable subscriber that sends notifications of calls and messages from the mobile phone and displays the time and date in front of the person wearing the smart glasses are portable devices that can be used as an extension of connected to the wearer's glasses or sunglasses and paired with the smartphone via Bluetooth. This expansion includes an Arduino microcontroller with an ATmega328p microprocessor, which is programmed to interact with a smartphone via a smartphone app. The Bluetooth module called HC-05 is ATmega328p with an interface to connect with a smartphone. Use battery / 5V rechargeable battery as power for Smart-Glass. SSD1306, 0.96-inch OLED display interfaces with ATmega328p for the display of data received from a smartphone. Smartphone apps transfer mobile data such as date, time of call reminders and text messages.

II. OBJECTIVES

- Blinded by various sets of protocols many companies do not allow employees to use mobile phones during work hours also while one is driving using a phone is a big risk.
- One can easily be heedful of the notification alerts, and message/call updates.

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- User can see the real world as well as perceive the virtual content created provided by the smart glass. Accomplishes real-time and enriched interaction between the smart glasses' user and the physical world with augmented data.
- To connect humans with machines, it is a wearable computing device used as an extension connect humans with machines, it is a wearable computing device used as an extension

III. PROBLEM STATEMENT

The main problem that we identified to get this idea is that many people are facing some issues to check their phone notifications while they are working especially some people who need to sit and work for a long time and also the people who are driving in the heavy traffic which has been the common issue all over the world and the people are searching for the device that can resolve their issue that to make the easy way to get to know their notification which helps the people and the solution to get to use the smart glasses by which the user can connect the mobile to the device and check the notification which he got while they are working and also driving in heavy traffic.

IV. LITERATURE SURVEY

SrNo	TITLE	AUTHOR	ABSTRACT
1	Evaluate instructions in AR for humanoid combined assigned by using protester	**Patrik Gustavsson**	This paper describes a protester created to determine whether a protester will be used as a testbed for assignment instructions. It asked whether protesters replicate humanoid combinations and whether AR-based associates can guide test persons through the assigned. The tests verified that this could be ready, but that instructions need to be clear and that future tests should be done in a more managed domain.
2	Objects' approach to AR as a support tool in the engine assigned	**Magnus Holm**	This paper focused fully on the objects' approach to assigned instructions. It reports on interviews with objects and monitoring of their interchange with instructions in assigned tasks. The objects were interviewed and monitored to determine how they currently interchange with instructions and their views on how working could be upgraded. The monitorization helped to recognize the most common instructions objects looked at during assignments. The interviews gave some awareness of how objects would like to work and interchange compared to the current plan. During the interviews, AR was reported to the objects, and 21 out of 28 objects clearly convey a positive view of using AR, showing a high initial obtaining of the technology.
3	Arduino AR glasses for product assembly mechanics a meta-analysis and classification	**Peter Thorvald**	This paper was a design review of a literature survey in the area of Augmented Reality in the production industry in the last few years. The classification, particular area, and similar classification of some identified papers were analysed to identify those related to objects, manufactured support, and AR. This results in a total of thirteen subgroups with three standpoints:objects, designing engineering, and technological majority.
4	AR smart glasses for objects in	**Lihui Wang**	This paper was a literature survey that hand out a deeper analysis of the object's perspective on AR and connected

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	manufacturing: a survey of material categories for supporting objects		categories that were identified in the paper. It encapsulates the findings in the form of a table visible the current status and future provocation for each the classification.

V. SYSTEM ARCHITECTURE

The smart glass component works with the consideration principle and the light-focusing principle. The information exhibited on the OLED screen is returned by the mirror and exhibited on the anti-reflective glass and then attentive on the screen by the mirror. The component is powered by a rechargeable 370 mA Li-Polymer battery. With the help of a USB charging circuit, Arduino Nano's power is controlled by the switch. The Bluetooth HC-05 module is controlled by Arduino Nano to show the received output on the OLED screen.

An Arduino Microcontroller has an ATmega328p microprocessor, which is ordered to connect with Smartphones through a Smartphone application. A Rechargeable battery of 5V is used as the power supply for Smart Glass. An OLED display is merged with ATmega328p, which is used to exhibit the data received from Smartphones. Smart-Phone applications are used to transmit data of the phone, i.e., Date, Time, Notifications of the Phone call and Text messages.

These are the main steps that are designed during the whole process:

1. Execution
2. Encoding.
3. Decode and Process.
4. Transmitting and receiving.
5. Notification Received

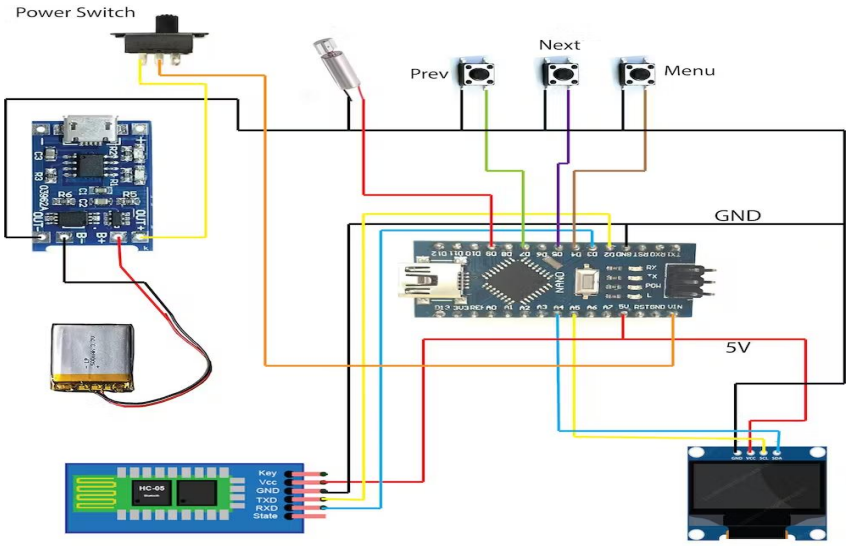

Figure 5.1 System Architecture

The above circuit will interchange with the application through the Bluetooth module

1. It should receive notifications on the smartphone.
2. This notification should be encoded via the mobile application to be sent via the Bluetooth client.
3. The encoded signal data should be received by the Bluetooth module HC05 and proceed onto the Arduino Nano for decoding and forwarding.
4. The Arduino should forward the signal to the display unit and will receive an optimum output.

5.1 APP Architecture

Massachusetts Institute of Technology App Inventor is a web application united development environment originally provided by Google, and now supported by the Massachusetts Institute of Technology (MIT). It permits strangers to

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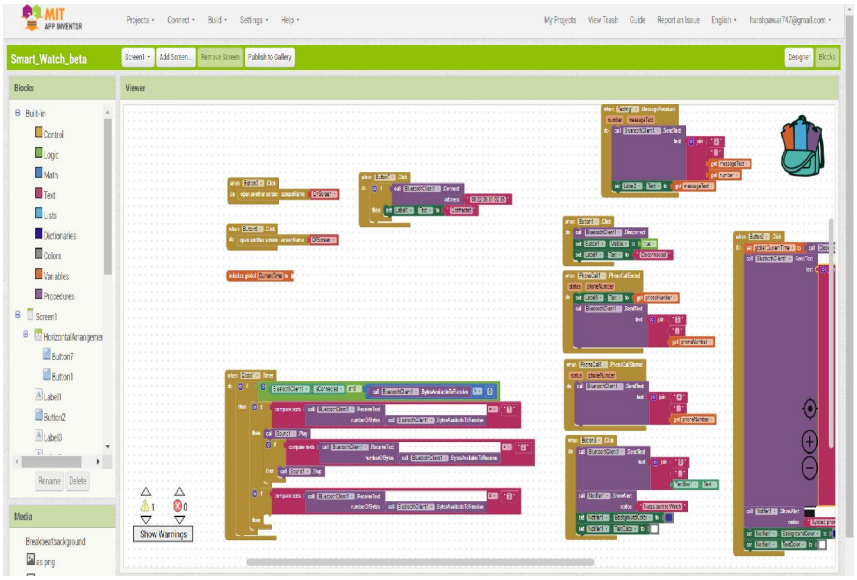
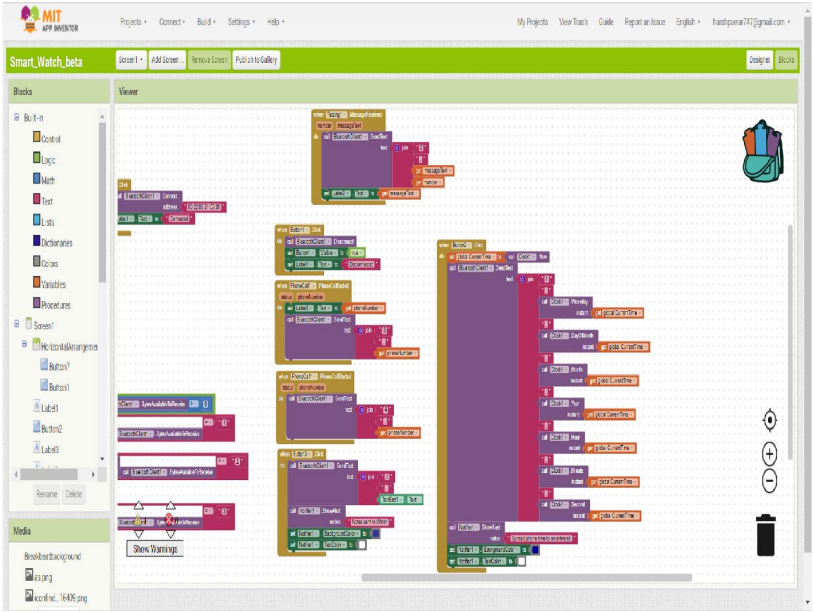
computer programming to create application software apps for two Android operating systems, Android, and iOS. It will be using a graphical user interface (GUI) very similar to the programming languages Scratch programming language and Star Logo, which permits users to punch up visual components to build an application that could run on mobile devices. In developing App Inventor, Google drew upon significant primary research in educational computing, and work ready within Google on online development environments. Overall, our system should work with the Bluetooth module to access the notifications of a smartphone to be shown on the screen. Thus, in order to work structure an Android application was the first concern, overall, different modules and network buttons were to be accessed and placed appropriately. Definite blocks in the app inventor that interchange with the Bluetooth client is reviewed and built according to the requirements to pass on the notifications of the smartphone to the display unit connected to the spectacles. The App Inventor programs narrate how the phone should acknowledge certain events: a button dated pressed, the phone is being vibrated, or the user is pulling his finger over a canvas. Some commands need one or more input values to completely identify their action. Thus, specifically certain blocks have been designed to access the Bluetooth client and pass on the notifications to the shown unit for the optimum working of thesystem





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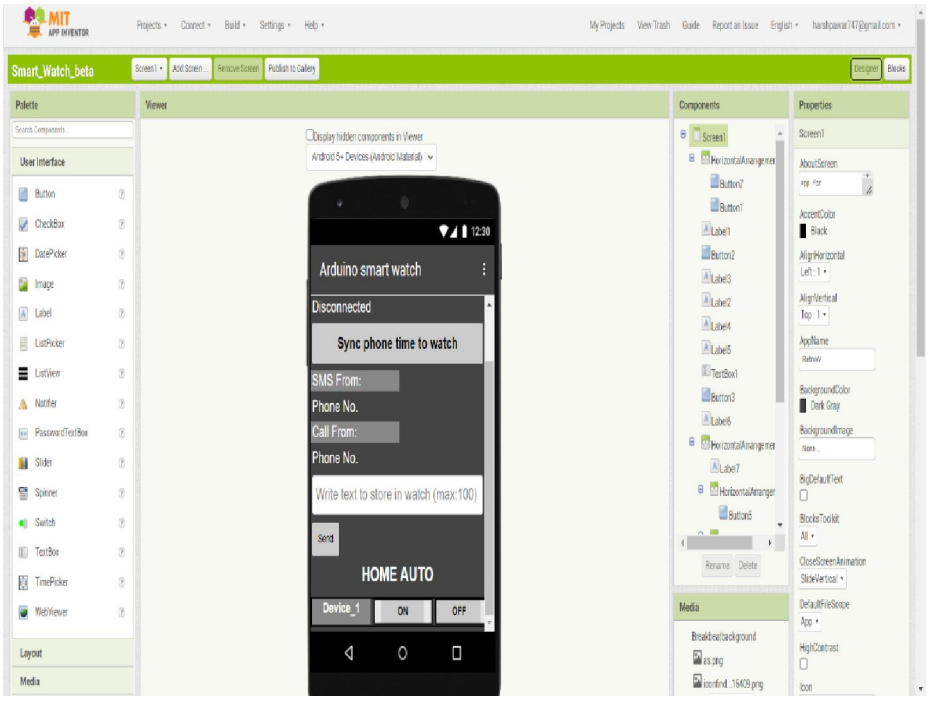

VI. FLOWCHARTS

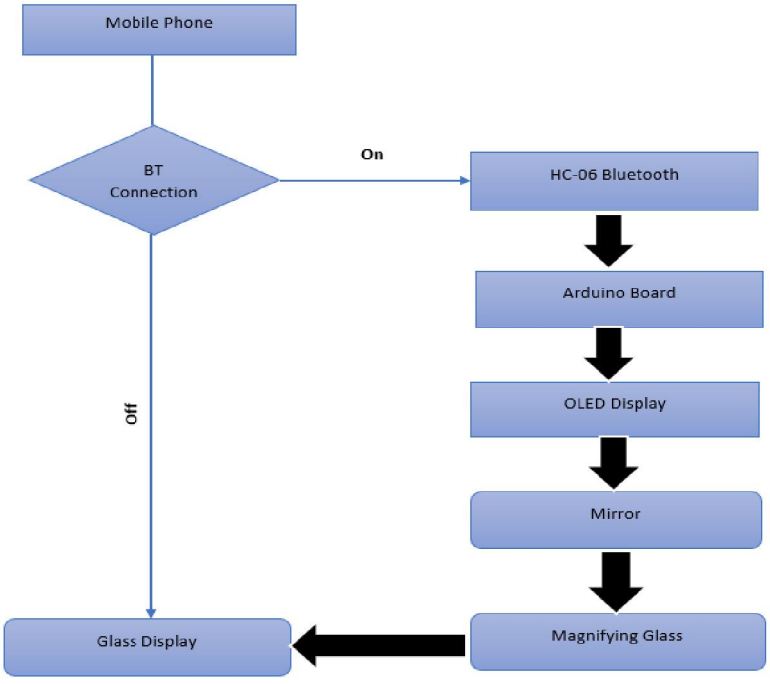

Figure 6.1 Flowchart for Identification

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VII. FLOW DIAGRAM

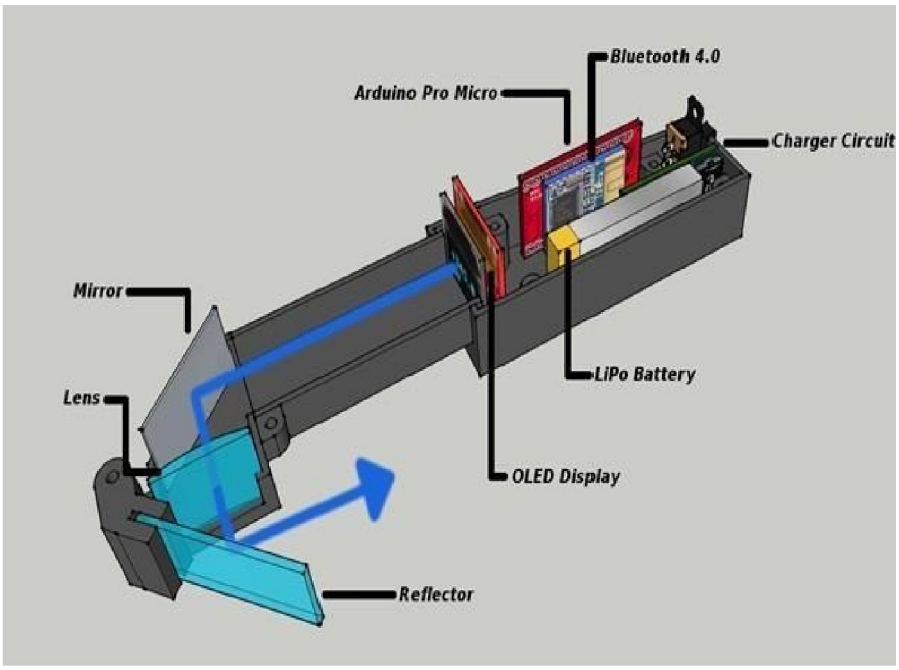

Figure 7.1 Flow Diagram

VIII. TOOLS FOR DEVELOPMENT

8.1 Software Requirements Specification:

- Arduino IDE
- MIT App Inventor

8.2 Hardware Requirements Specification:

- Arduino nano R3
- 64*128 OLED Display module
- HC-o5 Bluetooth Module
- 12 mm push button
- Toggle switch
- Charging module
- Rechargeable Li-Po battery, 3.7V

IX. ADVANTAGES

- Automation
- Efficient
- Easy to use
- Real time access
- Accuracy in identification
- Quick and Rapid

X. RESULT

As the system supplies basic notifications which are examined through the smartphone connected via Bluetooth HC05.
1. Time and Date

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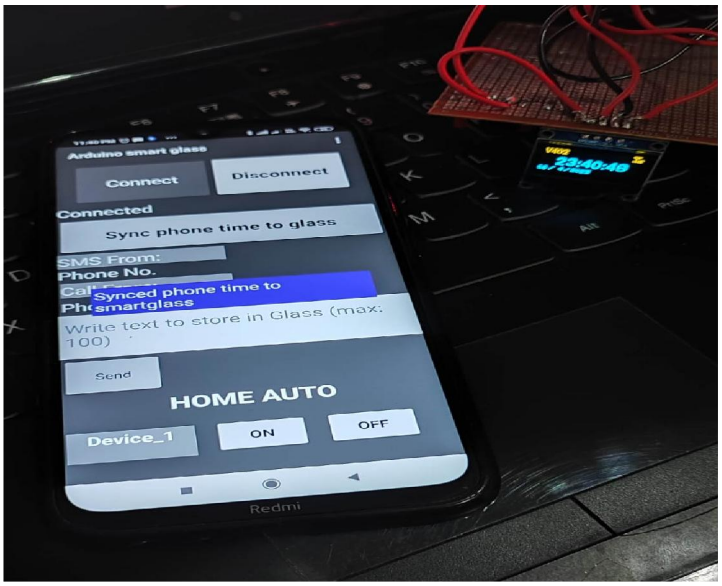

Fig 10.1 Output 1

We can locate the local time on the system absolutely concurred with the smartphone

2. Call received

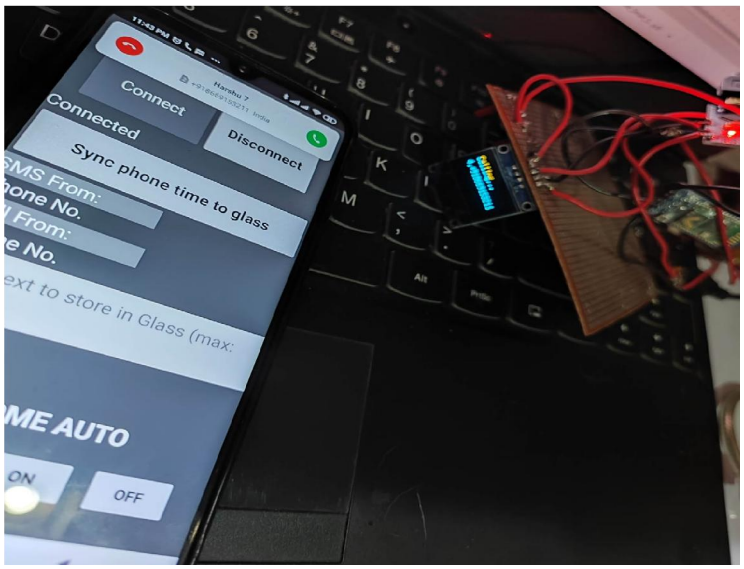

Fig 10.2 When one sends a text message to the system phone

The call is built from an unknown device to the system phone and its returns by appearing the call coming to it with the phone number.

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3. Text Message Receive

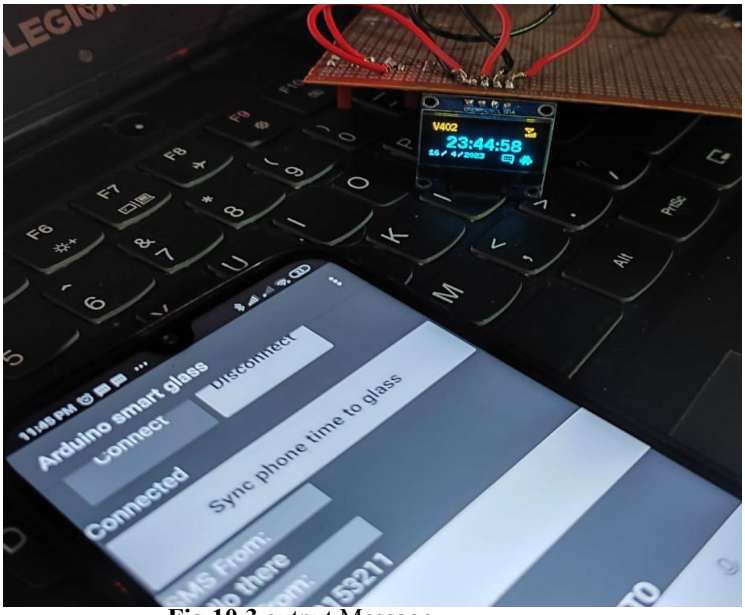

Fig 10.3 output Message

Here the message collected by phone is shown in the form of notifications with a message icon in the corner.

XI. ACKNOWLEDGMENT

It gives us satisfaction in presenting the prior project report on "Arduino Smart Glasses Augmented Reality Headsets." I would like to take this chance to thank the internal guide of our college, Prof Prashant Dike for giving us all the help and guidance we needed. We are thankful to him for his kind support. His treasure suggestions were facilitative.

XII. CONCLUSION

The report demonstrates how to build a smart spectacle with basic features. Basic features like times, dates, and notifications in different scenarios. This architecture is designed to be cost-effective and it is very environmentally friendly. As this is the first prototype of our design, with utmost probability in future we are going to wear these glasses. The prototype just contains the basic feature of notifications such as time and date, messages, and calls. The next version can include advanced features like checking the humidity of the surroundings, temperature, and many others. Audio assistance, smart speakers and voice control functions can be included in advanced versions. A camera can be added to smart spectacles for facial recognition. As it develops for face recognition, we can push the limitation further by including a 360° view. Using Machine learning and Artificial Intelligence these glasses can be used for reading texts which will be beneficial for blind people. Improvisation can be done at an advanced level; a virtual reality environment can be provided. Also, smart glasses have vast scope in Augmented Reality. As technology advances navigation options along with audio options can be added.

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