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# SMART AUGMENTED REALITY GLASSES USING ARDUINO

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**Abstract:** Engineering solutions have involved in everyone's life, most importantly are those aiming to help people with disabilities, however, the modern assistance devices with their current prices are not meeting the requirements of the market. This paper is mainly focusing on people with visual impairments. It is presenting a concept of smart glasses to provide assistance in multiple tasks represented as modes to be chosen by the user. To prove the concept, this implements only one mode which is reading using text detection techniques. Smart spectacles or smart glasses are wearable smart glasses that add information along side to what user sees. Alternatively, smart glasses are sometimes defined as wearable computer glasses that are able to change their optical properties at runtime. Smart sunglasses which are programmed to change tint by electronic means these are an example of the latter type of smart glasses. Superimposing information onto a field of view is achieved through an optical head- mounted display (OHMD) or embedded wireless glasses with transparent heads-up display (HUD) or augmented reality(AR) overlay. Smart glasses are may collect information from internal or external sensors.

## 1.INTRODUCTION

Today, innovations emerge every day; one such innovation is Augmented Reality . Smart phones and media devices have become common place, and they are an excellent way to access sound, video, and the internet. In 2010 Google came up with a product called Google Glasses that could provide a head-mounted screen showing the exact display of a smart phone screen. Smart glasses are one such device having real-time caller-id display functioning, useful when hands-free notifications perceiving required without actually holding a device.

For displaying information to the spectacle screen, concepts of Refraction, Reflection and Magnification are utilized. The module of the Smart-Glasses is attached to a spectacle frame. The module can be detached and again attached to the same or any other spectacle frame. The casing consists of a micro-controller , a serial input receiving component, a display screen, a mirror &a lens that is attached to the transparent thin film in the end. The tilted thin film is directed to the eye of the user wearing the module. When the module is paired with a smart phone, serial data of a caller- id is sent to the serial input device. The data is then processed by the microcontroller and redirected to the display screen. In the Smart glasses, Arduino was used as a micro – controller and a 128x64p computing SSD-1306 OLED screen .The Program is processed using MATLAB, and Text recognition mode is implemented. The glass is smartly constructed with miniature frame. OLED displays are used for the glass frames desired reflection. Smart glasses are wearable head mounted display that is attached to the frame of spectacles. . Using the module of smart glass, spectacles work as a transparent screen to show phone notification without hindering the sight of the user. Smart glasses can be used in daily life activities such as driving so that the user can focus on hands –on activities and receive notifications without getting distracted. Binded by various sets of protocols many companies do not allow the employees to use mobile phones during the work hours also while one is driving using a phone is a big risk. Smart glasses will use as a module to connect the smart phone and take the notifications and thus will be displayed on an OLED panel which then gets projected on a glasses and

converged from there it will get displayed on the glasses which is in the users field of view. Mobile phones have become the 4th basic necessity for people in the 20th century , but one has to maintain decorum while using a phone at work and are unable to use it sometimes during lectures, meetings or some urgent Calls .Smart Augmented glasses would bring a better approach for this problem. Calls .Smart Augmented glasses would bring a better approach for this problem.

## 2. COMPONENTS REQUIREMENTS

- OLED Display
- Arduino Nano A Tmega 328p
- Jumper wires
- Lens
- Transparent glass

## 3.Working

The smart phone application is paired with the smart phone module The module continuously gets serial data through the phone. .If a call is made to the paired device, the caller-id of the caller is sent to the module which is directed to Arduino. The Arduino processes the input and then commands the OLED display to show the notification of the call along with the caller-id in real- time. If there is no notification on the phone, then the real-time data of smart phone which is further processed by Arduino and shown on the OLED display.

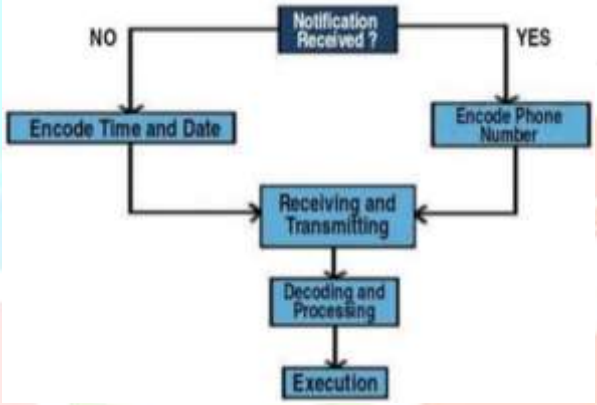


fig 1.1 working diagram

Simple lenses are subject to optical the optical discussed above. In many cases these can be compensated for to a great extent by using a combination of simple lenses with complementary aberrations compound lens is a collection of simple lenses of different shapes and made of materials of different refractive indices, arranged one after the other with a common axis. In a multiple-lens system, each lens treats the previous lens's image as an object, and produces a new image of it, so that the imaging is cascaded through the lenses. This is easy to understand when the image from one lens is before the front focus of the next lens, but it remains true even when the intermediate image is located within the focal length of the next lens or even beyond it.

## 4. Components Requried

- A 0.96 inch 128x64p SSD-1306 OLED screen display is used to show the output obtained from the Arduino in the Smart Glass module.
- Module is used to receive serial input from the paired mobile phone after which it sends data to Arduino Nano.
- Arduino Nano is a 14 pin micro-controller that operates on 5V or 3.3V. It processes the input from the module and commands the OLED display\.
- Lens, Mirror and film are used to show visible information to the user without hindering the sight.
- A battery is used as a Power supply for there all time information processing in the device.

## 5. Conclusion

The low-cost, efficient, highly effective and real-time information processing head-mounted display of Smart Glasses was created and the proposed functionalities were implemented. Smart Glasses can be used when the user's hands are not free to hold a device and the user simultaneously needs to perceive information from a screen. It can be attached to any usual spectacle frame easily. It is lightweight and economical and its components are easily available. By software and hardware changes the functionalities can be easily increased. The system provides satisfactory results the system provides basic notifications to the display unit such as SMS, time, date and information about the sim card the phone is using in a continuous loop. This system is placed in a 3D case which fits with any spectacles and can be used as a portable device. The implementation of one mode in the education scope is presented in this report, which is reading mode utilizing the text recognition techniques. The implementation of the text recognition techniques specified in the methodology was first done using Matlab code and functions, this helps in formalizing the algorithm before modeling it using Simulink.

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