

Smart Goggle Lens using Arduino Uno

Prof. Vijay Bhosale¹, Raj Gadhav², Ramesh Choudhary³, Pravin Darade⁴, Shivam Dhir⁵

Professor, Department of Computer Engineering¹

Students, Department of Computer Engineering^{2,3,4,5}

Mahatma Gandhi College of Engineering and Technology, Navi Mumbai, Maharashtra, India

Abstract: *As technology is growing rapidly and integrating itself to all the aspect of people's life, designers and developers try to provide a more pleasant experience of technology to people. In today's world people are eager to work smartly. So, they require smart gadgets, equipment, devices and products to develop a smart environment. One of the technologies that will help to make smart environment is the technology of Wearable Computing. Wearable Computing is a study of inventing, designing, or building a device that acts as a one type of computer for carrying on body, it's a refers to electronic technologies which can be worn or attached on the body to facilitate interaction between the human and the computer. Wearable's aim to assist people to be in control of their life by augmenting the real life with real life with extra information constantly and ubiquitously. Inspired by Google glass, Proposed system Smart Goggle Lens is a futuristic device, it's one of the wearable devices that is capable of handling the wide range of the activities that an ordinary goggle cannot do. Proposed System provide functionality like it can work as a normal goggle to view outside scenario and also smartly provide functionality of popping up notifications. The light intensity of the incoming popping notifications would be low enough that the user does not get distracted but good enough to notify user.*

Keywords: Arduino Uno, Lens , Smart Goggle, Low Density Light

I. INTRODUCTION

As technology is growing rapidly and integrating itself to all aspects of people's life, designers and developers tried to provide a more pleasant experience of technology to people. One of the technology trends which aim to make life easier is wearable computing. Wearable's aim to assist people to be in control of their life by augmenting the real life with extra information constantly and ubiquitously. One of the growing trends of wearable computing is Head Mounted Displays (HMD), as the head is a great gateway to receive audio, visual and hectic information. A useful technique for all kinds of people including handicapped/disabled. In this project, we will make a wearable extension, 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 wearer's eye. Smart- Glasses are the wearable computing device used as an extension, which can be attached to the spectacles or sunglasses of the wearer, and can be paired with Smart Phones, via Bluetooth. This extension, contains an Arduino Microcontroller having ATmega328p microprocessor, which is programmed to connect with Smart- Phones through a Smartphone application. A Bluetooth module, named HC-05 is interfaced with ATmega328p, which is used to connect with smart-phones. A battery / Re-chargeable battery of 5V is used as power supply for Smart-Glass. An SSD1306, 0.96" OLED display is interfaced with ATmega328p, which is used to display the data received from Smart-phones. Smart-Phone application is used to transmit data of the phone, i.e. Date, Time, Notifications of Phone call and Text messages

II. LITERATURE SURVEY

There is an existing system named Google Glasses. These glasses are far more advanced, hailing the new generation of technology under the domain Augmented Reality (AR) . These glasses are a part of wearable computing and are also a voice controlled device. The 1st version Google glasses was released in 2013. This product was a complete standby product (working as a hands-free smartphone) featuring head mounted display. It had the ability • To take photos/videos • To access the google search engine • Google Maps collaboration • Support of Voice Instructions and Video calls • Calendars, Reminders, Translation • Allowing Emails and Text messages Although these glasses were proven to invade privacy (captured all records everyday life) which became the biggest main reason why Google ceased all the work on this Google Glass Project in the year 2015 . A new version of these Google Glasses was launched in the year 2019 - The

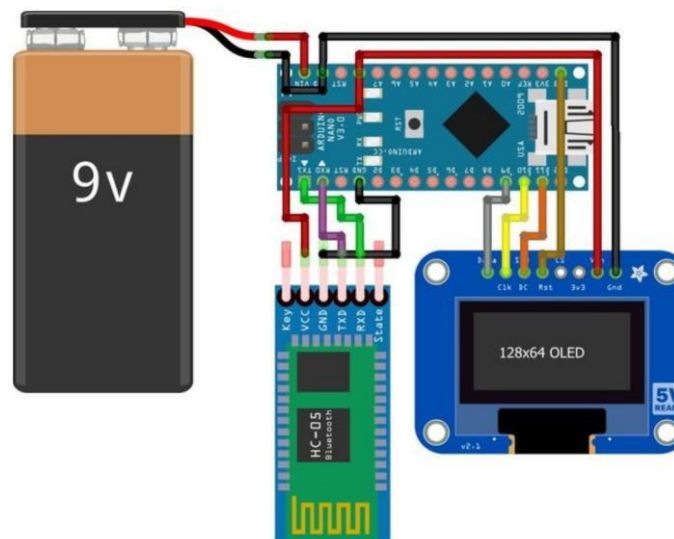
Glass Enterprise Edition 2. It is built on the Qualcomm Snapdragon XR1 platform which has a multicore CPU and a new Artificial Intelligence Engine. The features involve in improvement of the camera quality and performance in addition to USB-C port that supports faster charging and increased overall battery life . Reports have shown that Apple is going to launch Augmented Reality Glasses under the name Apple Glass with an approximate launch price of 499 USD between the year 2022-2023. The features of these Apple Glasses are remarkably like that of Google glasses with a reduction in the launching price Epson Moverio BT-300 lightweight eyewear device contains a front-facing camera, motion tracker, and a display on each lens. The device is suitable for entertainment, manufacturing, medical science, and more North Focals and Vuzix Blade are some other examples of successful AR glasses. North Focals acts like a smartwatch with popping notifications and can access Alexa, auto-responding text messages. Vuzix Blade consists of an HD Camera, Noise cancelling mics, full-colour, wireless wi-fi, UV protection lenses, dual haptic feedback, multilingual voice control and microSD expansion and is mainly built for maintaining industry operations.

III. PROPOSED SYSTEM

The smart glass module functions by reflecting and focusing light to display information from an OLED screen onto an anti-reflective glass with the help of a mirror and focal lens. It is powered by a 280 mA Lithium Polymer battery that can be charged via a USB charger circuit, and an Arduino Nano controls the power supply with a switch. The Arduino Pro Nano acts as the CPU and interfaces with the Bluetooth HC-05 module and the OLED display to display data received from a smartphone application. The ATmega328p microprocessor is programmed to connect with smartphones via the application and is interfaced with a Bluetooth module to establish a connection. A rechargeable 5V battery powers the smart glass. The steps involved in the process include receiving notifications, encoding, transmitting and receiving, decoding and processing, and execution. The following are the main steps that are implemented during the whole process:

- Notifications Received
- Encoding.
- Transmitting and Receiving.
- Decode and Process.
- Execution.

IV. SYSTEM ARCHITECTURE



Arduino Nano (ATMega328p) ATMega328p is high performance, low power controller from Microchip. ATMega328p is an 8-bit microcontroller based on AVR RISC architecture. It is the most popular of all AVR controllers as it is used in Arduino boards

Battery (9V battery) The nine-volt battery, or 9-volt battery, is a common size of battery that was introduced for the early transistor radios. It has a rectangular prism shape with rounded edges and a polarized snap connector at the top. This type is commonly used in smoke detectors, gas detectors, clocks, walkie-talkies, electric guitars and effects units.

Bluetooth module (HC-05) The HC-05 is a module which can add two-way (full-duplex) wireless functionality to your projects. You can use this module to communicate between two microcontrollers like Arduino or communicate with any device with Bluetooth functionality like a Phone or Laptop.

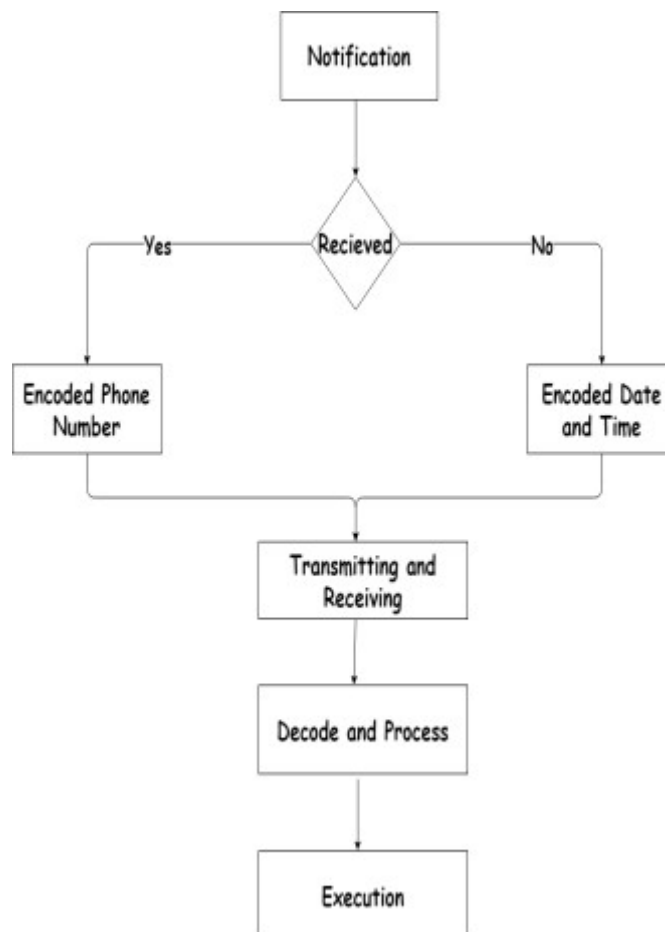
OLED display (SSD1306) SSD1306 is a CMOS OLED driver with controller for OLED dot-matrix graphic display system. Due to use of SSD1306 driver, number of external components required and power consumption has reduced. OLED display is used for displaying text, images and various patterns

Wires for connection Connecting wires allows an electrical current to travel from one point on a circuit to another, because electricity needs a medium through which to move. In the case of computers, wires are embedded into circuit boards, carrying pulses of electricity that are interpreted as binary signals of zeros and ones.

Push Button A Push Button or simply button is a simple switch mechanism to control some aspect of a machine or a process. Buttons are typically made out of hard material, usually plastic or metal.

Toggle switch A toggle switch is a type of electrical switch that is actuated by moving a lever back and forth to open or close an electrical circuit. There are two basic types: maintained contact and momentary toggle switches

V. FLOW CHART



Finally, the donated organ is transported to the patient’s hospital and received by the transplant surgeon. However, suppose the situation is for a live donor and it has been planned to donate to a known person by name. In that case, the data will go directly to the transplant surgeon to start the surgery of removing and transplanting the donated organ.

In the past, when a patient died or was near death, the organ procurement organization and hospital worked together to do an initial medical test to decide if the patient could be an organ donor. The accuracy of the wait-list data is largely dependent on people’s faith and trust in these centers’ ability to keep it secure from hackers and fraudulent employees. In general, modern systems manage data through the use of standard databases, however, most hospitals, health ministries, and other medical facilities lack a standardized data communication system .

In recent years, blockchain technology has attracted much attention in different sectors because it offers a distributed and secure database without the need for a third party or a central authority Later, the Ethereum blockchain architecture inserts computer programs into blocks to represent financial instruments, which are known today as smart contracts.. By using blockchain, medical information may be stored securely, and patient data could be updated in real-time and across various entities.

- We present six algorithms along with their full implementation, testing, and validation details.
- We conduct security analysis to determine that the proposed solution is secure against common security attacks and vulnerabilities. Our proposed solution is general and may be easily adjusted to meet the needs of a variety of related applications.

Journal committee as indicated on the Journal website. Information about final paper submission is available from the website.

V. IMPLEMENTATION DETAILS

Smart Goggle lens will get on using Push button and Hence the circuit will start working.

After Circuit get start working the device Bluetooth Module named HC-05 get turned on which is interfaced with ATmega328p, which will help us to connect our smart phone with smart goggle lens via Bluetooth. Once it gets connected with smart phone, now inside the Arduino Micro-controller gets into work and the micro controller works on following principle:

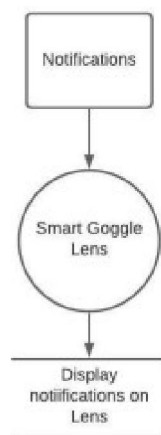
1. Notifications Received.
2. Encoding.
3. Transmitting and Receiving.
4. Decode and Process.
5. Execution

As per principal, Arduino Micro-Controller sends signal to the SSD1306, 0.96” OLED display that is interfaced with ATmega328p which is used to display Output.

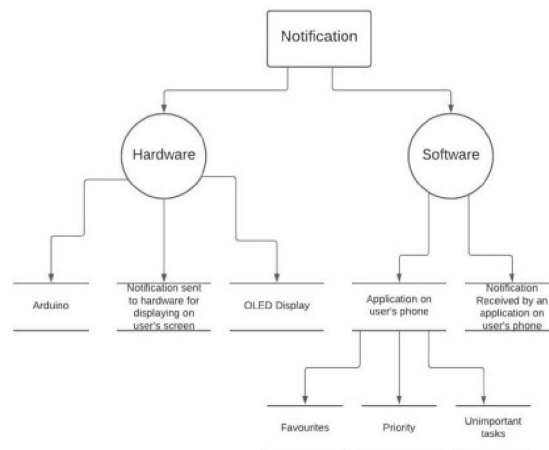
The Display reflection get reflected by mirror frame to smart lens.

After this any individual gets notification which is displayed on their smart goggle lens

5.1 Database Design



Level 1 DFD



Level 2 DFD

In Level 1, there shows the overview of the system, that is Notifications will occur, will be first processed onto smart goggle lens through our implemented mechanism and then will display notification on the lenses.

In Level 2, there shows a complete internal structure flow of how the notifications will be processed. Initially, our system works on two phases simultaneously which is hardware and software. In hardware phase, when the notification has arrived, the notification is processed through Arduino then we have an OLED screen to display our notification on the user's screen. In software phase, when notification is arrived, an application must be installed on the user's phone to view the usage of goggles that is (notifications, calls). Under that application, we have some further classified tasks like:

1. Assigning the favorite contact.
2. Giving/setting the priority for contact.
3. Unimportant tasks.

VI. CONCLUSION

Smart Goggle Lens is a hardware product using IOT and connected to a mobile application. It helps in viewing any notification popping on the mobile phone. The switch on the side of the lens, controlled by the user decides whether the lens should act as a normal goggle or as notification showing lens. Also, which receiving notification should be popped up is also decided by the users themselves through the mobile application connected to the Lens, prior to using the product. Due to this product, the concentration in doing work remains the same as the user already gets to know what their notification is about, without checking their phones. Smart Goggle Lens thus proves to be extremely helpful in day- to day lives, especially to the people for whom their TIME is MONEY.

VII. ACKNOWLEDGEMENT

We would like to express our gratitude to the M.GM College of Engineering and Technology for providing us with the necessary resources to conduct this research. We would also like to thank Prof. Vijay Bhosale for his guidance and support throughout the project. Additionally, we are grateful to project coordinator Prof. S.P. Vidya Bharde .Head of the Computer Department, and all other faculty members who provided us with valuable insights and feedback. Finally, we extend our thanks to all the participants who willingly contributed their time and data to this study.

REFERENCES

- [1]. <https://www.tibco.com/reference-center/what-is-iot>
- [2]. <https://www.wordstream.com/googleglass#:~:text=Google%20Glass%20is%20a%20wearable,other%20apps%20by%20voice%20commands>.
- [3]. <https://internetofthingsagenda.techtarget.com/definition/Google-Glass>
- [4]. <https://blog.google/products/devices/services/glass-enterprise-edition-2/>
- [5]. <https://www.intuz.com/blog/augmented-reality-glass-application-usecases-challenges-future-potential>