

# Light Fidelity (Li-Fi) Technology-Cryptographic Data Transmission

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## Abstract

In our project, the Wireless Fidelity (Wi-Fi) hotspot is rapidly increasing signal is sure to suffer. They are vulnerable to hackers as it penetrates through walls easily. The major concerns are security and speed. Li-Fi technology is said to overcome this. In our project, there is a new technology that using the LED sends the data through an LED light bulb that the intensity faster than the human eyes can see. In the future of this project, we will see the data for smartphones, tablets, and laptops transfer using the sunshine during a room. Maybe a Li-Fi is a fast optical version of Wi-Fi, this technology on light communication.

## 1. INTRODUCTION

With the drastic increase in the use of digital gadgets such as personal computers, smartphones, and tablets, a most daily job now performed digitally. This makes everything easier, faster, and more efficient. Given the option, most people today would prefer doing things electronically rather than sitting down with a pen and paper. In fact, given a choice, people would like to click an image rather than typing things out manually. In these documents, it is easy to increase the document to be scanned and shared via an electronic. However, a scan is merely an image capture of the original document, so it cannot be searched through in any way. In current times the innovation is growing so quickly that every nation is understood with the event of technology. Technology is changing the way of imagination. In upcoming years individuals can transmit the data through light. In which Harald Hass successfully demonstrated that the information can transmit through the light, which is known as Li-Fi. Li-Fi gives more speed than Wi-Fi. Wi-Fi is that the present technology; however, in the future, there will Li-Fi, which can utilize for transmission of the knowledge. The innovation is changing in different fields.

For example, transportation, smartphones, banks, and so on. ATM cards are presently used, but after demonetization, people started using ATM card more those who do not know how to use.

ATM card they also learn and started using ATM cards, As users are increasing, so frauds are also increasing and to give security to the cards technology is using different ways of techniques like cards are becoming replaced via

cardless. For example, Samsung pay, Google wallet in which we can pay from smartphones. The payment methods also require cryptographic methods for the authentication of a user to stop any third party personal from retrieving.

## 2. REVIEW OF LITERATURE

The proposed system is being developed for the transaction System, security purpose. Security is necessary to hide the details of user credentials so that no one can hack it. For security, the existing card is replaced by a cardless system. The method proposed is to aim for encryption of user credentials through the Advanced Encryption Standard Algorithm (AES).

The encrypted credential will be sent through flashlight (Li-Fi technology), and at the receiver side, it will detect through LDR sensors, send the signal to the Arduino board. In Arduino, user credentials will get decrypt through AES, and then Arduino send user credentials to the computer, and we get original data.

## 3. WORKING TECHNOLOGY

The system flow diagram for the proposed system. The system architecture shows the smartphone, which will play an important role, having user's credentials. First, the user's credentials will encrypt using the public key of the AES. The encrypted form will be converted into bit code, and then the bit code will be transmitted through the flashlight of a smartphone to the receiver's end and transmitted successfully. At the receiver side, the LDR sensor is integrated into Arduino. In Arduino, ADC signal detection and the bit code conversion is performed, bit

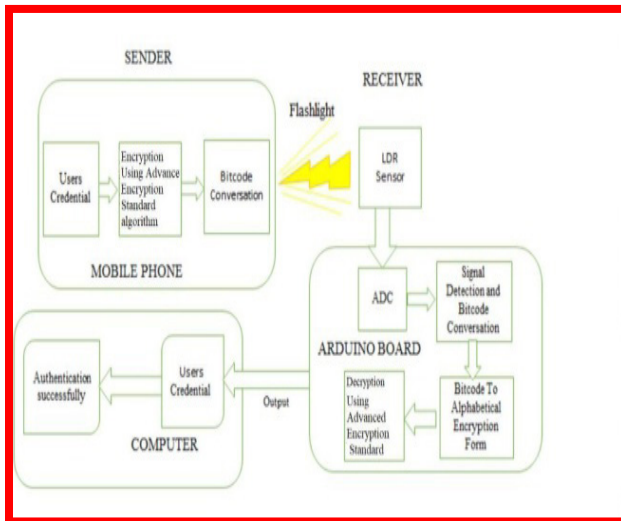


Figure 3.1: Circuit Diagram

code to the alphabetical encrypted form, and decryption using AESA. LDR sensor will detect the flashlight of the smartphone. The LDR sensor will send the signal to the ADC. Signal first convert into analog and then digital form. Then the digital signal will convert into bit code and bit code to the alphabetical encrypted form. Finally, the encrypted form is decrypted by using the private key of the AESA. The output will be shown on the computer as the original user's credentials.

Ultrasonic sensors are used to sense the traffic and are placed around the entrances of intersections. The ultrasonic sensors judge the traffic itself and then send it to the microcontroller after every 5 seconds. When the traffic is detected on the straight lane in the north-south direction, it then checks the east and west directs signal, whether it is green or not.

#### 4. PROBLEM STATEMENT

To enhance the quality and quantity of agricultural products, there is a need to adopt new technology. Pear classification requires early and cost-effective solutions. The image processing approach that provides a consistent, less time-consuming solution to farmers for managing the use of pesticides and fertilizers. In a place where the bulk of fruits are to be analyzed as per their quality and shape features, testing each fruit manually and classifying it as defected or fresh is a time-consuming task. The data in the form of an image is not only difficult to store as it takes a lot more space than other types of data, but to filter the image and retrieve the information according to the content required takes a lot of time and human effort. We need a system that optimizes this process, and the output of the system should be more than binary. These problems lead to the development of an automated system that is capable of the classification of fruits encompassing image processing techniques.

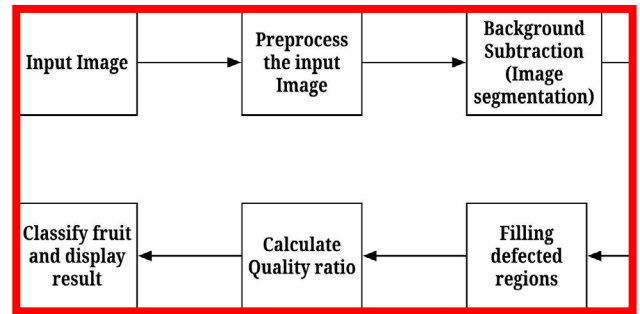


Figure 5.1: Block Diagram

### 5. PROPOSED SYSTEM

The upcoming huge technology we have describe the new innovation of gathering the series of algorithms through confidentiality. The wireless technology that is ready to create an impact is termed Li-Fi, which accesses the internet through light instead of using the traditional radio frequencies. The AESA provides an asymmetric function of using public and private keys, and finally, the data Authentication and security is conducted using the Secure Hash Algorithm (SHA). Every LED can be made a hotspot. The Li-Fi technology provides the future of radio frequencies is very congested, and the 10,000 spectrums times are wider than radio frequencies. Considering the 220 Gbps speed approximately is much better than the WiFi's current highest speed of 1.3 Gbps and this project's main point, it is used in medical health care, and industries use in Wi-Fi restricted areas.

### 6. IMPLEMENTATION

Hardware requirements

- Arduino
- LDR sensor
- PCB
- Connection wires
- Smartphone

Software requirements

- Arduino IDE
- Android application
- Python
- JDK

### 7. CONCLUSION

Thus, the WIFI and Hot spots used to every bulb, if Li-Fi technology can be put into the practical. It conducted faster, simple, and efficient wireless digital communication. This technology makes us proceed with the safer, cleaner, and brighter future. We find the new in the future, data for smartphones, tablets, and laptops can be transmitted through light in a room by using Li-Fi. The researcher is developing a micron-sized LEDs that can flicker on and off around 1,000 times quicker than larger than LEDs. The data

is transmitted faster and takes up less space, so the further boosts the channel of communication, we could add more LEDs. This technology many problem solve, like shortage of frequency bandwidth and also allow the web where the normal radio-based wireless isn't allowed such aircraft and hospitals.

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