LIGHT FIDELITY COMMUNICATION FOR AUDIO TRANSMISSION

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BONAFIDE CERTIFICATE

Certified that this project report entitled "**LIGHT FIDELITY COMMUNICATION FOR AUDIO TRANSMISSION"** is a bonafide work of **ARVINDHAN K – 22BEC1026, DEEPTA VM-22BEC1086, SYED NABIEL HASAAN M – 22BEC1063,YASHAWINI V-22BEC1253 AND PRAHADEESWAR C – 22BEC1146** who carried out the Project work under my supervision and guidance for **BECE304P-Analog Communication Systems**

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ABSTRACT

This project investigates the utilization of Light Fidelity (Li-Fi) technology for audio transmission, offering notable advantages over conventional radio frequency (RF) systems such as heightened data rates, improved security, and immunity to electromagnetic interference. Through the development of a prototype system capable of transmitting audio signals via modulated light, we explored the feasibility and performance of Li-Fi for this purpose. Our comprehensive experimental evaluations encompassed assessments of audio quality, data rate, and system reliability under varying conditions.

Our results affirm the practical viability of Li-Fi for audio transmission, presenting a promising alternative where RF-based systems encounter limitations. This research expands the horizon of Li-Fi technology, shedding light on its potential applications in audio communication domains. By showcasing its effectiveness in transmitting audio signals, we lay the groundwork for future integration of Li-Fi in diverse scenarios, offering valuable insights for the advancement and deployment of Li-Fi-based audio communication systems.

ACKNOWLEDGEMENT

We extend our sincere gratitude to all who played a part in completing this Light Fidelity (Li-Fi) project for audio transmission.

Our heartfelt thanks to **Dr. P.Nirmala** for their invaluable guidance and support throughout the project. We also appreciate the dedication of our team members, whose collaboration was pivotal to the project's success.

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1.INTRODUCTION

1.1 OBJECTIVES AND GOALS

The project aims to explore the feasibility of using Light Fidelity (LiFi) technology for audio transmission, evaluating its performance in terms of audio quality, data rate, and reliability.

1.2 APPLICATIONS

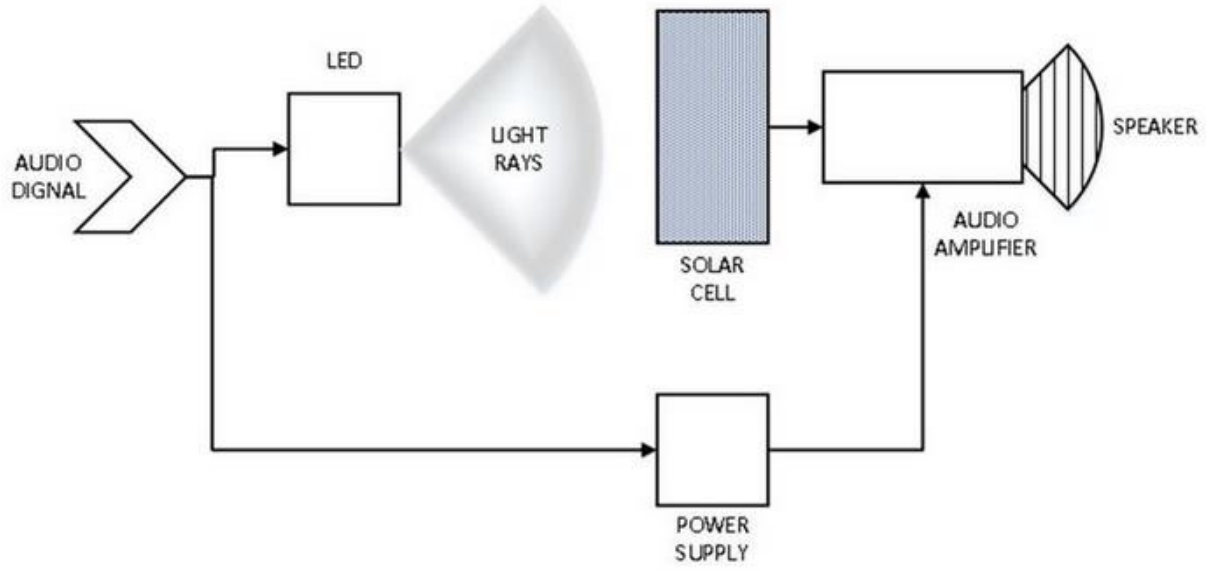
Potential applications include secure audio communication in sensitive environments, underwater audio transmission, and audio broadcasting in crowded RF environments.

1.2 FEATURES

Features include high data rates, immunity to electromagnetic interference, increased security, and utilization of light waves for audio transmission.

2. DESIGN AND IMPLEMENTATION

2.1 BLOCK DIAGRAM

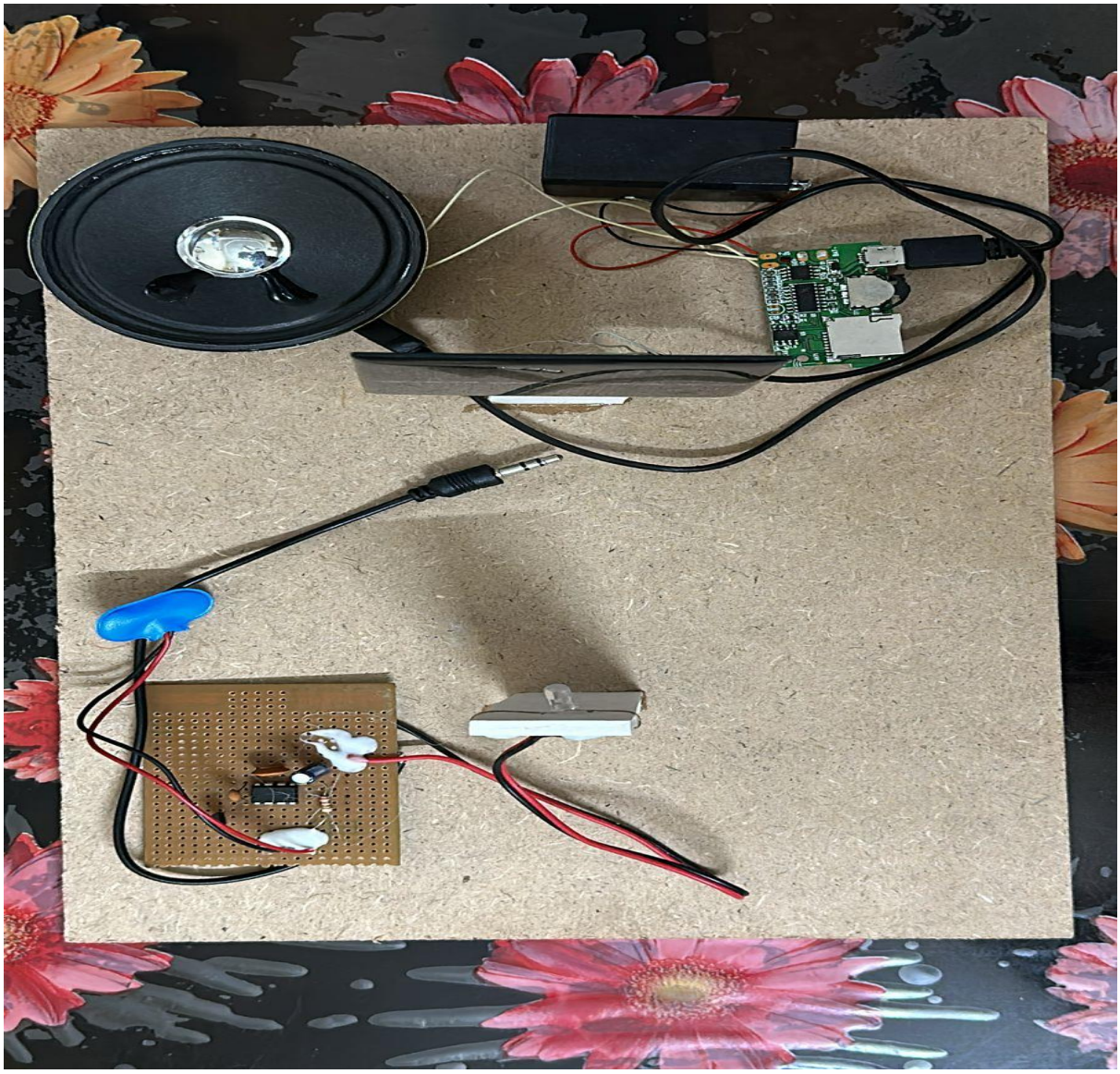


2.2 HARDWARE ANALYSIS

1. **Amplifier Circuit**: A suitable amplifier circuit is designed to amplify the audio signals generated from the phone's USB connection. This circuit ensures that the audio signals are strong enough for transmission through light.
2. **USB Connection**: The phone is connected to the amplifier circuit via a USB cable. The audio signals from the phone are transmitted to the amplifier circuit for amplification.
3. **Light Transmitter**: The amplified audio signals are then modulated onto a light source, such as an LED. The LED acts as the transmitter, emitting modulated light signals containing the audio information.
4. **Solar Panel Receiver**: On the receiving end, a solar panel is used to capture the modulated light signals. The solar panel converts the received light signals back into electrical signals.
5. **Speaker Connection**: From the solar panel it's connected to wireless HI-FI module which amplifies the sound is connected to a speaker. The speaker reproduces the audio signals, allowing users to hear the transmitted audio.

2.3 SNAPSHOTS

https://youtu.be/DpUvT1f5qoM?si=fKzyw_lH1fBOOskZ



3. CONCLUSION AND FUTURE WORK

3.1 RESULT, CONCLUSION AND INFERENCE

The implemented Li-Fi system successfully transmitted audio signals through light, demonstrating its feasibility for audio communication. The received audio exhibited satisfactory quality and reliability. This confirms the potential of Li-Fi as an alternative to RF-based audio transmission, especially in environments where RF signals are restricted. The results imply that Li-Fi technology holds promise for various applications requiring secure and high-speed audio communication. Further optimizations and real-world testing could enhance its practicality and expand its usability in diverse scenarios.

3.1 FUTURE WORK

Future work includes optimizing the Li-Fi system for improved data rates and range, integrating it into existing devices, developing standardized protocols, enhancing receiver design, and exploring specialized applications like underwater communication and IoT integration for broader adoption.

4. REFERENCES

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