

AUDIO TEXT AND IMAGE TRANSMISSION WITH LIFI TECHNOLOGY USING ESP32 CAMERA AND PYTHON

AIM:

Design and development of Audio, Text and Image Transmission with LIFI technology using ESP32 camera and python.

PURPOSE:

Light Fidelity (LiFi) technology has emerged as a promising alternative to traditional radio frequency (RF) communication for data transmission. Unlike RF, LiFi utilizes visible light to transmit data, offering higher bandwidth and increased security. This paper explores the feasibility of using LiFi for audio, data and image transmission. The focus is on evaluating the performance of LiFi in terms of data rate, latency, and reliability for these multimedia applications. The ESP32 camera module integrates LiFi capabilities to transmit captured images wirelessly via light signals. Experimental results demonstrate the feasibility and effectiveness of using LiFi with ESP32 and Python for real-time image transmission.

DESCRIPTION:

At transmitter side ESP32 camera interfaced with LIFI transmitter and PC. At receiver side LIFI receiver interfaced with Arduino and PC.

WORKING:

ESP32 camera interfaced with LIFI transmitter module when it was in image transmission mode. LIFI receiver interfaced with PC when it was in image transmission mode. PC has python code that can take image data from LIFI receiver and converts into image format and saved in local folder. In data transmission mode, LIFI transmitter module interfaced with PC (personal computer to transmit data through PC). LIFI receiver interfaced to Arduino through UART cable while in data receiving mode. LIFI modules have mode switches to shift mode from data to audio and vice versa.

TECHNICAL SPECIFICATIONS:

HARDWARE:

Microcontroller	:	Arduino Uno
Crystal	:	16 MHz
LCD	:	16X2 LCD
LIFI Module	:	UART based LIFI module
Camera	:	ESP32 camera
Power Source	:	12v 1 amp DC battery

SOFTWARE:

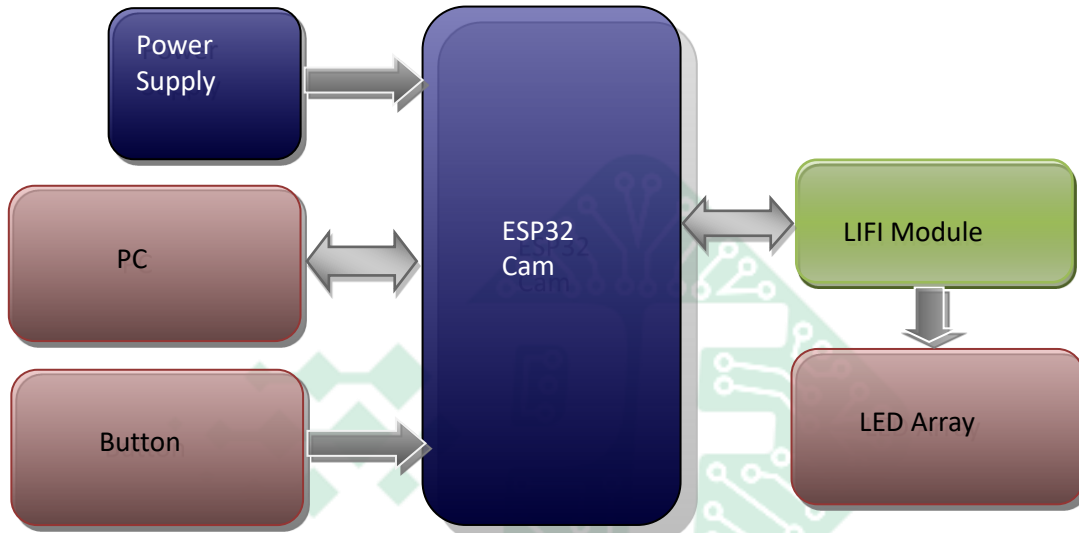
Arduino IDE
Proteus based circuit diagram

APPLICATIONS:

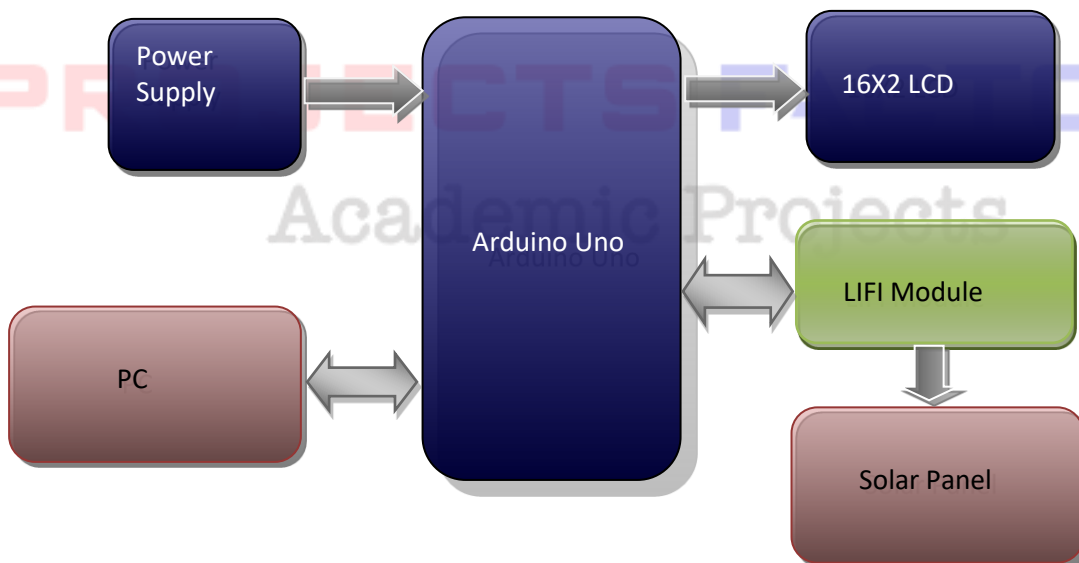
- LIFI based under water communication
- Image Transmission using LIFI
- LIFI based data communication
- ESP32 camera and LIFI image transfer
- LIFI based data and audio communication
- Real time image transmission through LIFI and python

BLOCK DIAGRAM:

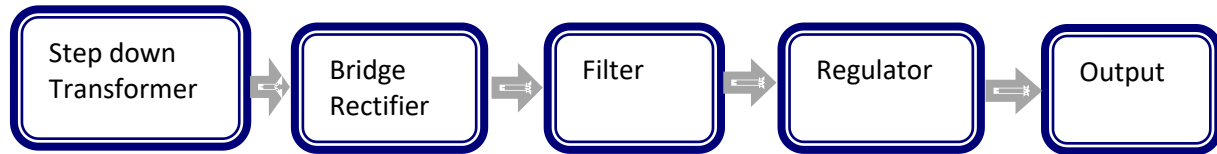
Transmitter:



Receiver:



POWER SUPPLY BLOCKDIAGRAM:



INTERFACES COVERED:

- We have covered LIFI module interfacing
- ESP32 cam image transfer with python integration
- LIFI Arduino interfacing with UART communication

PROJECTS FACTORY
Academic Projects