

Indoor Location Estimation for blind People Using Li-Fi Technology

Monika Ramchandra Botre¹, Anjali R Askhedkar².

¹MIT-World Peace University

²MIT-World Peace University

(E-mail: monika.botre27@gmail.com)

Abstract— Indoor navigation is opportune for everybody, and it's significantly requisite for the visually impaired. The paper proposes an interior navigation system for the Visually Impaired to realize audio output through actinic radiation Communications (VLC). The transmission info happens once distinctive the one who has entered the area and therefore the technology light-weight Fidelity (Li-Fi) is employed for presenting information to the user. Li-Fi technology is employed by the projected system for the broader vary of transmission of information. The usage of actinic radiation for sending the info encompasses a good type of blessings and eliminates most issues of communication caused by the magnetism waves outside the color spectrum. Li-Fi is the associate evolving branch of Optical Wireless Communication will|and may|and might be useful in returning years for indoor communication as a result of it can afford higher rate transmission in conjunction with the aptitude to utilize further users since it uses a broader spectrum information measure.

Keywords— VLC, blind navigation, Li-Fi, optical communication

I. INTRODUCTION

The Li-Fi technology will transfer the info through LEDs. it's a high speed and low price wireless communication system, compared to Wi-Fi. It will give high security, giant information measure, and low price. Li-Fi uses common unit LED (light emitting diodes) lightweight bulbs to alter information transfer, self-praise speeds of up to 224 gigabits per second. Lightweight Fidelity (Li-Fi) may be a biface, high speed, and absolutely networked wireless communication technology just like Wi-Fi. The term was coined by Harald Haas and may be a type of actinic ray communication and a set of optical wireless communications (OWC) and will be a complement to RF communication (Wi-Fi or Cellular network), or maybe a replacement in contexts of knowledge broadcasting. Li-Fi is thought of as higher than Wi-Fi as a result of there square measure some limitations in Wi-Fi. Wi-Fi uses two.4 – five GHz radio frequencies to deliver wireless net access and its information measure is restricted to 50-100 Mbps. This technology has been projected as an answer to the RF information measure limitations. Indoor navigation is convenient for everybody and it's particularly indispensable for the visually impaired. Li-Fi makes use of a free, unauthorized spectrum and isn't tormented by RF noise.

Moreover, most indoor locations would have a sufficient quantity of sunshine sources and supply further security since Li-Fi cannot penetrate through walls. People with visual disabilities, either part or wholly blind, a square measure typically challenged by places that aren't designed or their special condition. samples of these square measure bus and train terminals, hospitals, and searching malls. many “everyday” objects that square measure gift in most engineered environments become real obstacles for blind individuals, even golf stroke in danger of their physical integrity. easy objects like chairs, tables, and stairs, hinder their movements and may typically cause serious accidents. This Li-Fi technology helps the visually impaired to maneuver at intervals of indoor environments. the most objective of the system is to supply, in real –time, helpful navigation data that allows a user to form applicable and timely choices on that route to follow in an interior area. Indoor navigation is convenient for everybody and it's particularly indispensable for the visually impaired. Li-Fi makes use of a free, unauthorized spectrum and isn't tormented by RF noise. what is more, since Li-Fi cannot penetrate through the wall, most indoor locations would have Associate in Nursing enough quantity of sunshine sources and supply surplus security. The considerations of the dearth of frequency information measure are also dominated out by Li-Fi and high information transmission rates of up to 15Gbps are earned. With the increasing use of Wi-Fi, the prevailing frequency is obtaining clogged deliberately and at the same time, there square measure Associate in Nursing increasing variety of individuals UN agency need to attach to the web. LI-FI uses actinic ray Communication, which may be an information communications medium that uses actinic ray and can contribute the visually impaired individuals for the navigation and helps them to travel autonomously at indoor places.

II. LITERATURE SURVEY

An indoor human localization system for the visually impaired. A model moveable device has been enforced, consisting of a measuring device and a typical white cane, on that an optical maser vary finder and a 3-axis gyro are mounted. a unique create estimation formula has been developed for robustly estimating the heading and position of someone navigating in an exceedingly noted building. the premise of our estimation theme may be a two-layered extended Kalman filter (EKF) for angle and position

estimation. the primary layer maintains an Associate in Nursing angle estimate of the white cane, which is after provided to the second layer wherever a gripping estimate of the user is generated. Experimental results area unit bestowed that demonstrate the irresponsibleness' of the planned methodology for correct, time period human localization. VLC (Visible light-weight Communication) system exploitation fluorescent lights have been developed for indoor steering of the visually impaired. Whereas it's comparatively simple to produce generalized location data for a blind user, precise location data is far tougher to work out. we have a tendency to propose that the effective information reception vary and therefore the receiver's precise location will be calculated exploitation measured sensing element angles. A series of experiments are performed in an exceedingly sensible platform with twenty-two fluorescent lights, thirty-nine activity points (MP). the common distance error may reach as low as ten cm. This development can give larger accuracy and thus less stress for blind users. Blindness may be a condition during which a private loses the ocular perception. quality and self-reliability for the visually impaired and blind folks have continuously been a retardant. during this paper, a sensible Electronic Traveling Aid (ETA) referred to as BlinDar has been planned. This good guiding ETA ameliorates the lifetime of blind because it is well equipped with a net of Things (IoT) and is supposed to assist the visually impaired and blind to steer while not a constraint in shut-in addition as open environments. BlinDar may be an extremely economical, reliable, quick responding, light-weight weight, low power intense and price effective device for the blind. supersonic sensors are wont to observe the obstacle and potholes at intervals a variety of 2m. GPS and ESP8266 Wi-Fi module have been used for sharing the placement with the cloud. MQ2 gas sensing element is employed for the sleuthing hearth in the path and an RF Tx/Rx module for locating the stick once it's misplaced. Arduino Mega2560 is that the microcontroller used, which has fifty-four digital I/O pins that make the interfacing of parts straightforward. [3]

III. METHODOLOGY

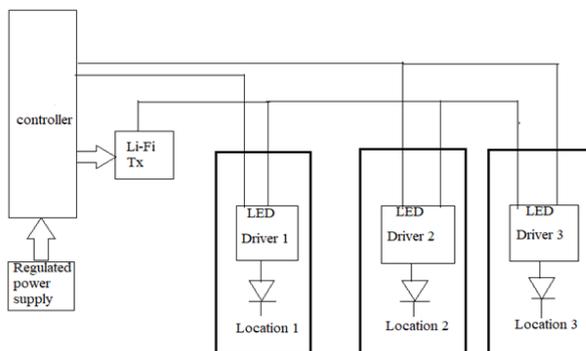


Fig.1. transmitter side

Li-Fi technology is based on LEDs for the transfer of data. Li-Fi Technology operates by sending the data over light. In

order to generate light signals LED (Light Emitting Diode) light bulbs, can be flashed on and off speedily. A Light Receiver is used for receiving the LED signals. The intensity of light can be employed to send data by the minute changes in amplitude. The technology focuses on light bulb being flickered up to billions of times a second and the particular phenomenon is unnoticeable to the human eye. If the LED is ON, a digital string of 1 is transmitted, if it's OFF then a string of 0 is transmitted. It can be switched ON and OFF very rapidly.

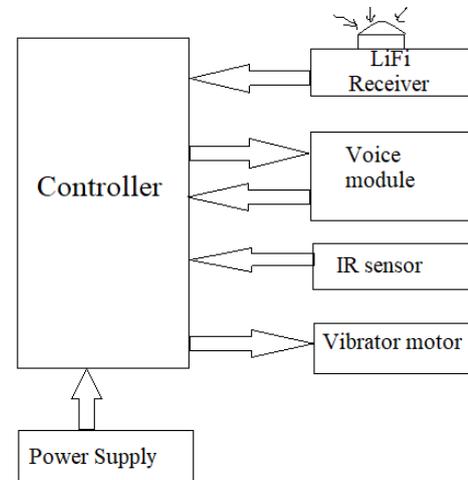


Fig .2.receiver side

We placed transmitter circuit in each room or location. Receiver circuit is embedded in cap of blind person. Whenever receiver come near transmitter i.e. blind person enters in particular location transmission took place. Output module comprises of Voice playback module and earphone. Output conveys room name in which he entered.

IV. SYSTEM IMPLEMENTATION

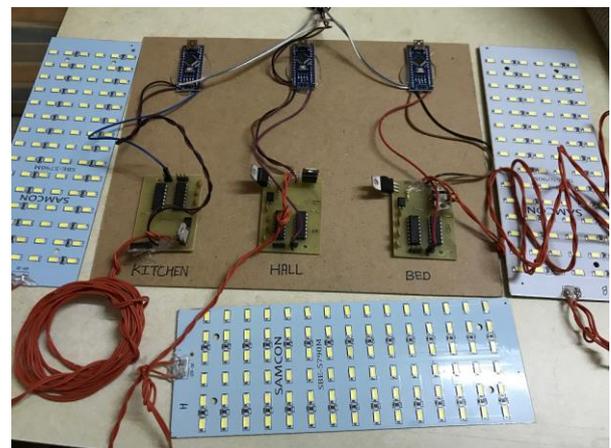


Fig.3. transmitter circuit

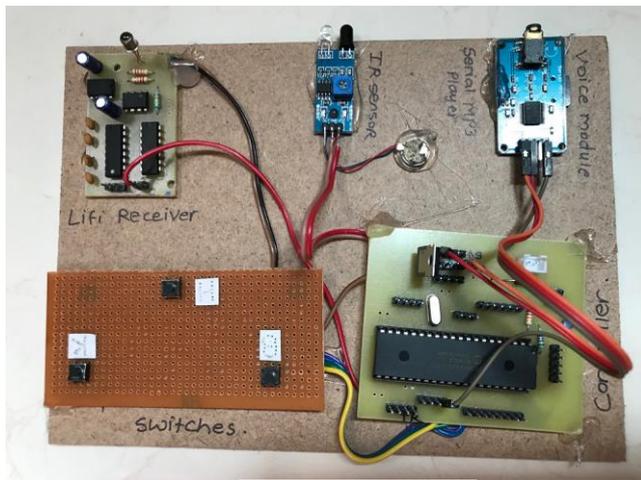


Fig.4. Fig .2.receiver circuit

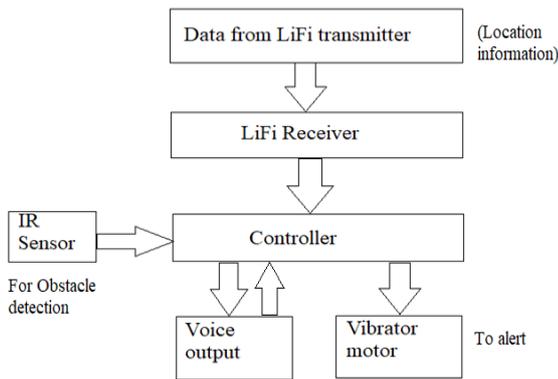


Fig.5. Flow Chart

V. RESULT AND ANALYSIS

Distance Between Tx & Tx

Distance (CM)	Detected
0-5	No
6-127	Yes
128	No

IR Sensor and Vibrator Sensor Communication

IR Sensor	Vibrator Sensor
0-7	Yes
8	No

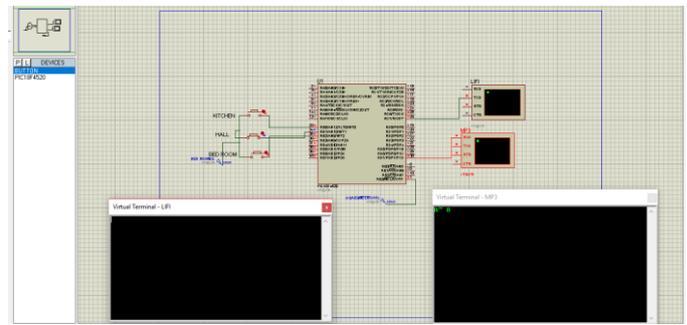


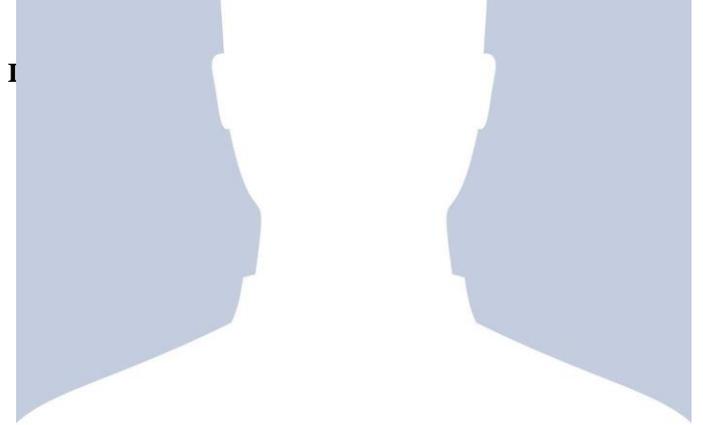
Fig. 6. Simulation Result

VI. CONCLUSION

Notwithstanding the employments of Li-Fi, it additionally fulfills the necessities of giving indoor route and furthermore helps the outwardly impeded individuals to maintain a strategic distance from snags and will likewise tell them about their present area. This innovation won't just enable a client with visual incapacities to ambulate into an indoor domain while staying away from obstructions, however it could likewise enable them to cooperate with nature. Later on we won't just have 14 billion lights, we may have 14 billion Li - Fi's sent worldwide for a cleaner, greener and even a more promising time to come.

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Monika Ramchandra Botre
M.Tech- VLSI and Embedded System, MIT-World Peace University.
B.E-Electronics.-Mumbai University.