Indoor navigation and positioning using LI-FI Technology

The project aims at designing a wireless system that enables to find out the present location of a person and also voice enabled announcement system. This project also helps in authentication as well as automatic attendance registration.

The technologies used in this project are LI-FI, an indoor localization system based on off-the-shelf Wi-Fi infrastructure and mobile phones. LI-FI is deployed in an office building covering over 1600m^2, and its deployment is easy and rapid since little human intervention is needed. In LI-FI, the calibration of fingerprints is crowd sourced and automatic. Experiment results show that LI-FI achieves comparable location accuracy to previous approaches even without site survey.

The controlling device of the whole system is a Microcontroller this project aim is to identifying the different blocks in the organization. Here we are using three push buttons by using these buttons we can identify the three blocks in the organization. And we can know where is the exact location of the block in the organization .and this information goes to the receiver and we can observe the on LCD.and at the same time we can here the voice by using voice circuit. To perform the intelligent task, Microcontroller is loaded with intelligent program written using embedded 'C' language

The main features of the project are:

1. To track a person in multiple room building.
2. Voice based announcement system.

This project provides exposure to the following technologies:

1. LI-FI technology
2. Interfacing LI –FI receiver and microcontroller.
3. Interfacing pushbuttons to micro controller
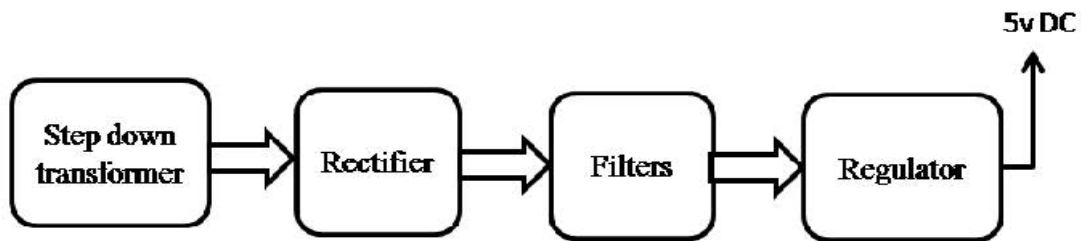4. Embedded C programming.
5. Design of PCB.

The major building blocks of this project are:

1. Regulated power supply.
2. Microcontroller based control units.
3. LI-FI module
4. LCD displays.
5. Crystal oscillator.
6. Voice recording and playback circuits.
7. Reset button.
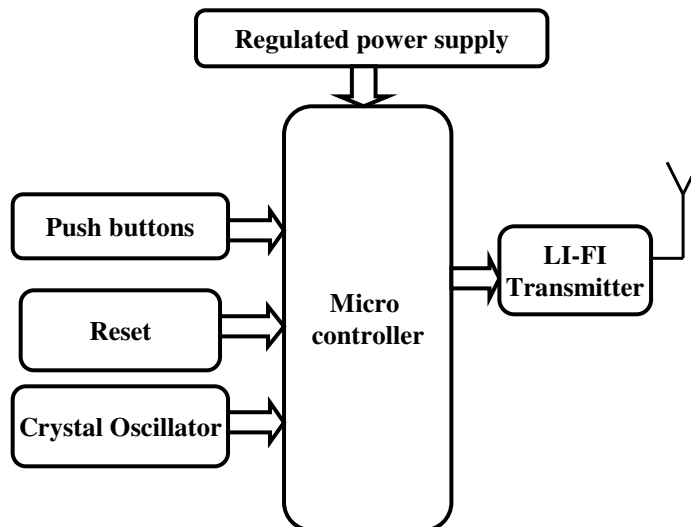8. LED indicators

Software used:

1. PIC-C compiler for Embedded C programming.

2. PIC kit 2 programmer for dumping code into Micro controller.

3. Express SCH for Circuit design.

4. Proteus for hardware simulation

Regulated power supply:

```
┌──────────┐      ┌──────────┐      ┌──────────┐      ┌──────────┐   5v DC
│Step down │ ───► │Rectifier │ ───► │ Filters  │ ───► │Regulator │ ───►
│transformer│     │          │      │          │      │          │
└──────────┘      └──────────┘      └──────────┘      └──────────┘
```

Block diagrams:

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2.Transmitter

```
                    ┌────────────────────────┐
                    │ Regulated power supply  │
                    └────────────────────────┘
                                │
                                ▼
 ┌──────────────┐        ┌──────────────┐
 │ Push buttons │ ─────► │              │        ┌──────────┐    Y
 └──────────────┘        │              │ ─────► │  LI-FI   │
                         │    Micro     │        │Transmitter│
 ┌──────────────┐        │  controller  │        └──────────┘
 │    Reset     │ ─────► │              │
 └──────────────┘        │              │
                         │              │
 ┌──────────────┐        │              │
 │Crystal Oscillator│──► │              │
 └──────────────┘        └──────────────┘
```

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Technology
2.Receiver