



# International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Website: [www.ijircce.com](http://www.ijircce.com)

Vol. 5, Issue 3, March 2017

## Flexible Technologies for Smart Campus

M.Sharmila, R.Kirubhanidhi, N.Keerthana, N.Aiswarya, R.Karthika

Department of Electronics and Communication Engineering, SNS College of Engineering, Coimbatore,  
Tamil Nadu, India

**ABSTRACT:** The article suggests a solution for students, their parents and visitors who receive user based dynamic information. They use their own smart phones for additional information. Smart Campus is a mobile application which detects buzz from the beacons. It is based on Blue Tooth Low Energy 4.0. The complete system consists of set of beacons, database related to CMS and the application on Smartphone. The data from beacon gets transmitted and it can be monitored in Smartphone or personal computer.

**KEYWORD:** ibeacons, BLE, CMS, Android, Mobile Application

### 1. INTRODUCTION

BLE is new specification of Bluetooth and is more likely related to GPS and NFC for indoor navigation. It allows mobile apps to understand their position on a micro local scale so that it can deliver hyper-contextual content to users based on location. Based on UUID an identification of information in mobile device gets activated by registration of beacons. BLE is a wireless personal area network technology which transmits data over short distance .It is small, low cost and of low power system.

### II. WIRELESS TECHNOLOGIES

The most popular indoor wireless technologies are:

- Wi-Fi is designed to accurately point to a devices exact location with wireless access points, by measuring parameters such as MAC address and SSID.
- ZigBee creates Personal Area Network (PAN) that transmits small amount of data. It provides not only better battery life but also a wider range
- Bluetooth enables the short range peripherals of those computers. It operates with a 2.4GHz frequency band



I Beacon

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## III. BEACON TECHNOLOGY

The technology offers location based services. Each beacon is effectively a cheap, small Bluetooth transmitter. If we move within the range of one of these beacons, a signal will be transmitted to our phone which gauges a response from app installed on our device. However, retailers, platforms and brands are allowed to know where a customer is at any time. This gives them chance to send advertising that is designed to trigger actions instantly.

## IV. HARDWARE

### PIC16F887

- It is of RISC architecture with 35 instructions, except branches all are single-cycle instructions. Hence their performance is very fast. It operates at a frequency of 0-20 MHz. There are 35 input/output pins, 3 independent timers/counters, watch-dog timer.
- Most pins of the PIC16F887 microcontroller are multifunctional which makes the microcontroller package more compact without affecting its operation. These various pins cannot be used simultaneously, but can be changed at any point during operation.
- This controller is very convenient to use as their coding is also easy. It uses FLASH memory technology.
- Chip can be reprogrammed upto 100,000 times. Data can be written more than 1,000,000 times.

### LCD

- Like light-emitting diode(LED) and gas plasma technologies, (LCD) liquid crystal display allows display to be thinner than cathode ray tube (CRT) technology in notebook and computers. They work on the principle of blocking light hence consumes less power



- LCD shutters consist of a stack of three primary elements. On the bottom and top of the shutter are polarizer plates set at right angles. Normally light cannot travel through a pair of polarizers arranged in this fashion, and the display would be black. The polarizers also carry the directors to create the twisted structure aligned with the polarizers on either side. As the light flows out of the rear
- Polarizer, it will naturally follow the liquid crystal's twist, exiting the front of the liquid crystal having been rotated through the correct angle that allows it to pass through the front polarizer. LCDs are normally transparent in this mode of operation. The lack of vacuum in an LCD television is one of its advantages; there is a small amount of vacuum in sets using CCFL backlights, but this is arranged in cylinders which are naturally stronger than large flat plates. Removing the need for heavy glass faces allows LCDs to be much lighter than other technologies. For instance, the Sharp LC-42D65, a fairly typical 42-inch LCD television, weighs 55 lbs including a stand, [1] while the late-model Sony KV-40XBR800, a 40" 4:3 CRT weighs a massive 304 lbs without a stand, almost six times the weight.

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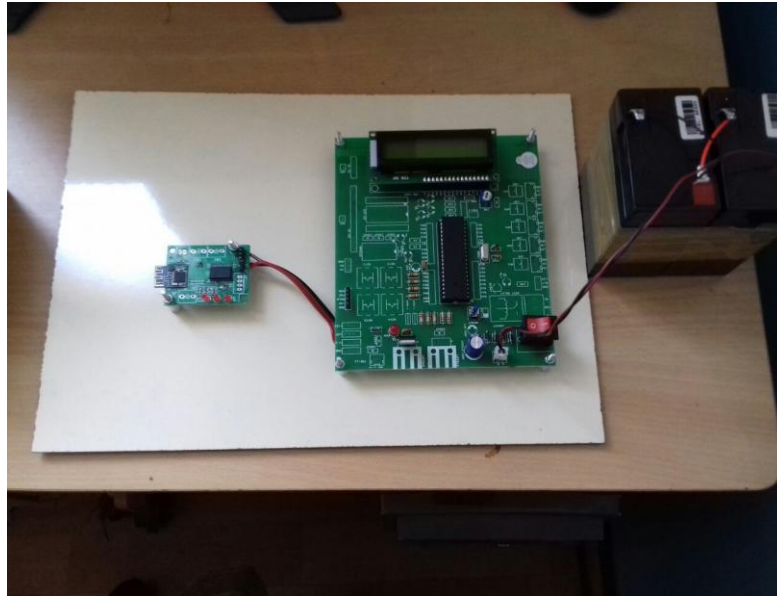
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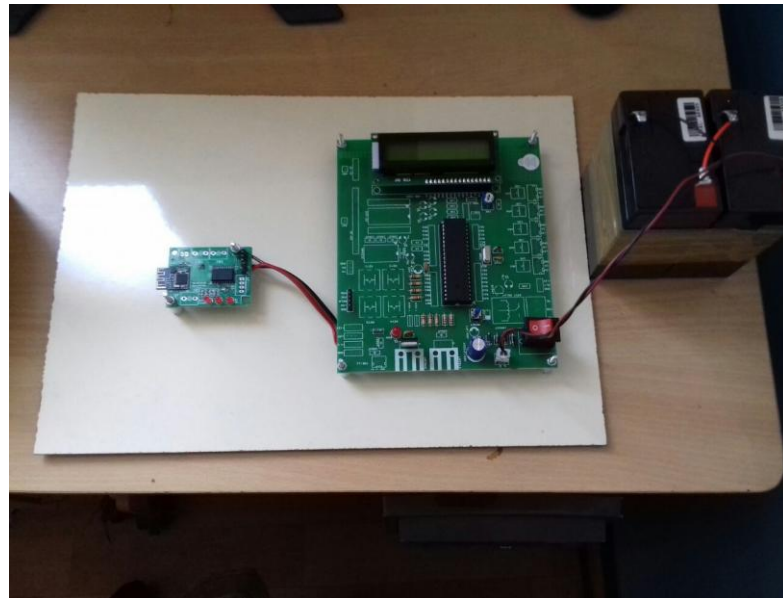
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V.HARDWARE IMPLEMENTATION

STUDENT 1



STUDENT 2



- iBeacon sensor senses the student thus it will indicate on the LCD i.e smart phone app so that we can identify the student by the location shown up.



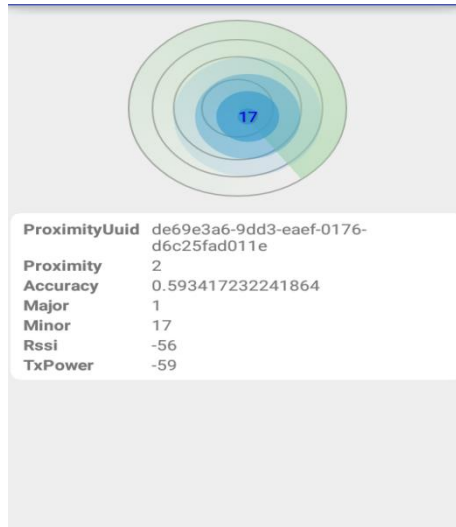
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## VL SOFTWARE IMPLEMENTATION



- UUID- It stands for Universally Unique Identifier. It contains 32 hexadecimal digits, split into 5 groups, separated by hyphens.
- Major and Minor values:
- Numbers assigned to my your iBeacons, in order to identify them with greater accuracy than using UUID alone.
- Tx Power:
- Used to determine the strength of the signal exactly.





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## VII. EXISTING SYSTEM

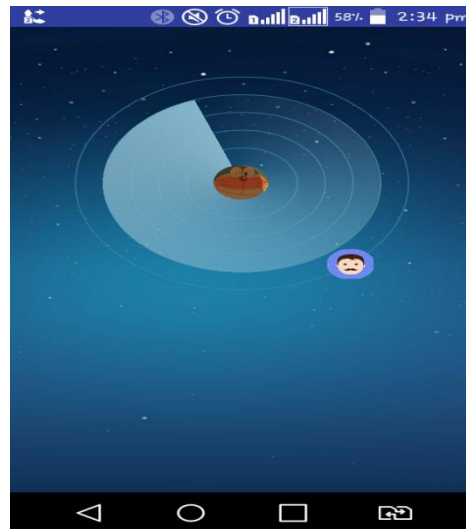
The Advance of rising technologies has broadened the means in addition because the applications of the web. In different words, virtually each “object” may be a part of a network. With sensible property, physical objects area unit networked and can gain the flexibility to speak with one another. The vision of “The web of Things (IoT)” guarantees to boost the capabilities of objects and forms a wise atmosphere in order that folks will have the benefit of the IoT revolution. The IoT applications cowl the building of sensible cities, the got wind of sensible atmosphere, the availability of sensible public services, the arrange of e Health, and also the building of sensible home/office, etc. because the international population grows.

### DEMERITS

- Radio frequency: 2.4 GHZ band
- Data rate: 38400 bits/s (minimum).
- Distance: only 10 meters long
- . Number of channels: it is able to search up to 3 channels only.
- Energy consumed: up to 30% is succeeded

## VIII. CONCLUSION

Depending on the profile and time of the day information for students, visitors can be delivered. They can do a guided tour, without an actual guide. This design is very flexible and can be easily adopted for other systems with similar tasks for example Smart City, Smart People.



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