Documentation

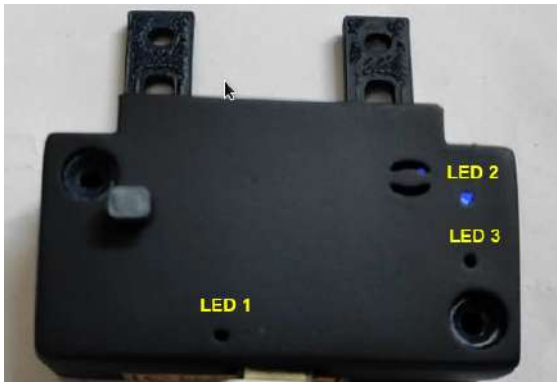
This documentation provides an overview of how to use Indoor positioning system and create an indoor positioning system using BLE beacons.It covers the implementation of the system, the calibration of the RSSI values, and the evaluation of the system's accuracy.

A beacon scanner BLE indoor positioning system is a system that uses BLE (Bluetooth Low Energy) sanners to locate and track the position of a (Bluetooth Low Energy) beacons within an indoor environment. The system works by placing BLE scanners at fixed locations throughout the indoor environment and scan for these beacons. When the scanners scans for BLE beacons, it receives a signal from the beacon it detects. The signal includes the beacon's unique identifier and the strength of the signal, which is measured by the RSSI (Received Signal Strength Indicator) value. The different RSSI values at each scanner for the corresponding beacon at one particular locaton provides an estimate of location of the beacon.

1. BLE beacons: These are small, battery-powered devices that transmit a signal over Bluetooth to a device that is in range. This is what the user is carrying

2. A scanner: This is a device, which is placed at different places detects the corresponding the rssi values of the beacon and sent it to the server for getting the location of the beacon.

3. Positioning software: This is the software that processes the signal strength data from the beacons and calculates the position of the scanner device within the indoor environment. The software may also provide a user interface to display the position of the beacon device.



Beacon

Scanner

LED status of the scanner

1. LED 1
   blinking – The beacon and scanner are conneted
   OFF – the beacon and scanner are not connected

2. LED 2
   blinkig for 3 sec when device starts and keep always keep ON

3. LED 3
   OFF – Charging
   stable –Not charging

4. LED 4
   blinking – Wifi is connected but not connected to server
   OFF – not connected to Wifi
   stable – Connected to Wifi and server

5. LED 5 – Modes Indicator (Refer below)

6. LED 6
   ON - Always

LED status of the scanner

1. LED 1
   OFF – Charging
   stable –Not charging

2. LED 2
   blinking – The beacon is working good
   OFF – the beacon and scanner are not connected

3. LED 3
   LED 4 – Modes Indicator (Refer below)

What is the status of the scanner now?

1. Working Normaly – LED1 – X, LED 2 – ON, LED 3 – X, LED 4- ON, LED 5 – X, LED 6 – ON

2. Not connected to Wifi – LED1 – X, LED 2 – ON, LED 3 – X, LED 4- OFF, LED 5 – X, LED 6 – ON

Solution:
1. Poweroff and then Power ON
2. Give the wifi credentials once more using hotspot mode (below explained)

3. Not connected to Server – LED1 – X, LED 2 – ON, LED 3 – X, LED 4- blinks, LED 5 – X, LED 6 – ON
1. Poweroff and then Power ON
2. Give the wifi credentials once more using hotspot mode (below explained)

What is the status of the beacon now?

1. Working Normaly – LED1 – X, LED 2 – blinking, LED 3 – X

2. Not connected to Wifi – LED1 – X, LED 2 – OFF, LED 3 – X

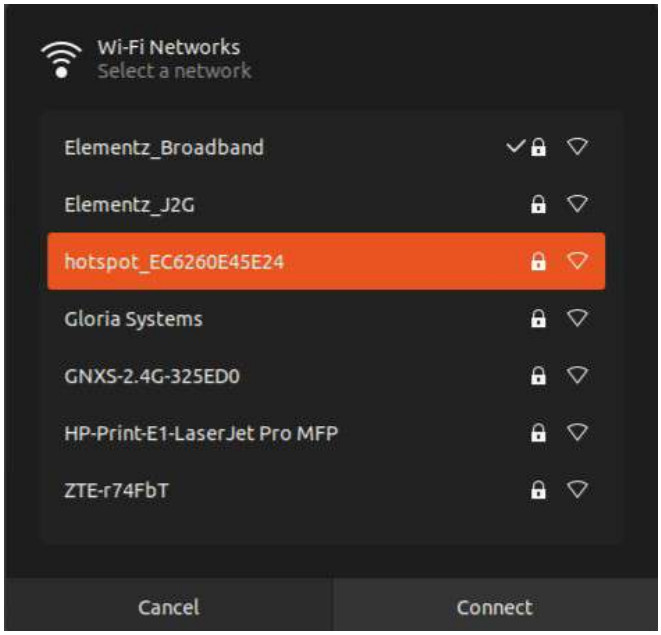
Solution:
1. Poweroff and then Power ON

Different Modes

Scanner

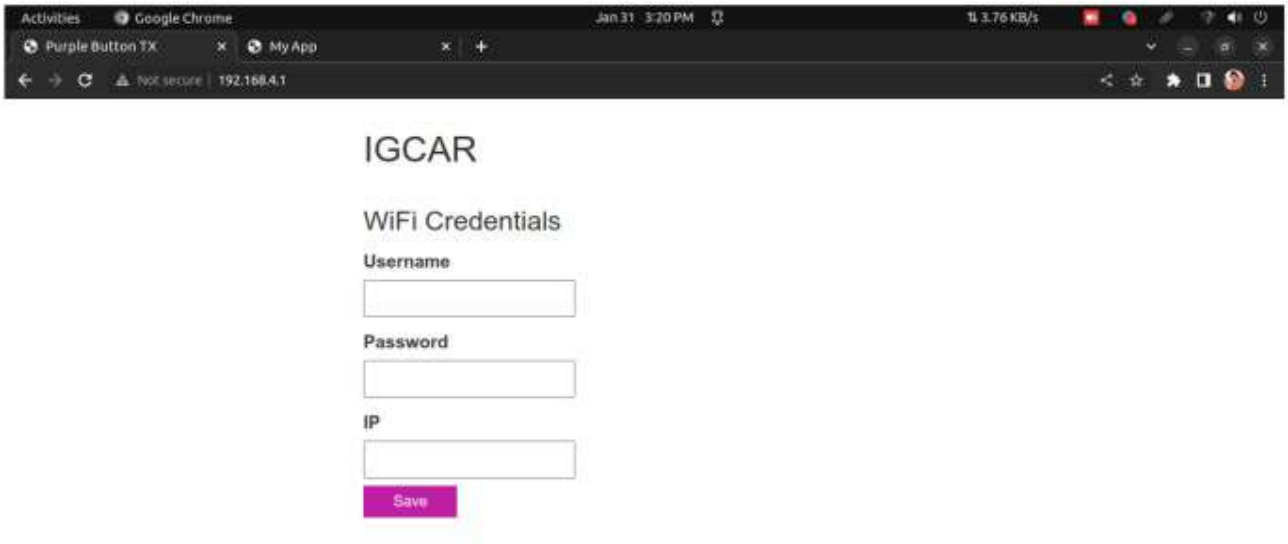
1. Hotspot Mode

a. For assigning wifi credentials to scanner board, enter into hotspot mode.For entering into hotspot mode press the button in the scanner board until LED 5 starts blinking slowly.Then select and connect to “hotspot_<scanner ID>” using the server.



Hotspot credentials:
ssid : hotspot_<scanner ID>
Password : 12345678

b. After connecting enter 192.168.4.1 in the browser for adding WiFi credentials.



c. Enter the credentials

Username: IGCAR_IPS
passwor: 12345678
IP: 193.168.0.101

d. click save
e. restart the device

2. POWER OFF Mode

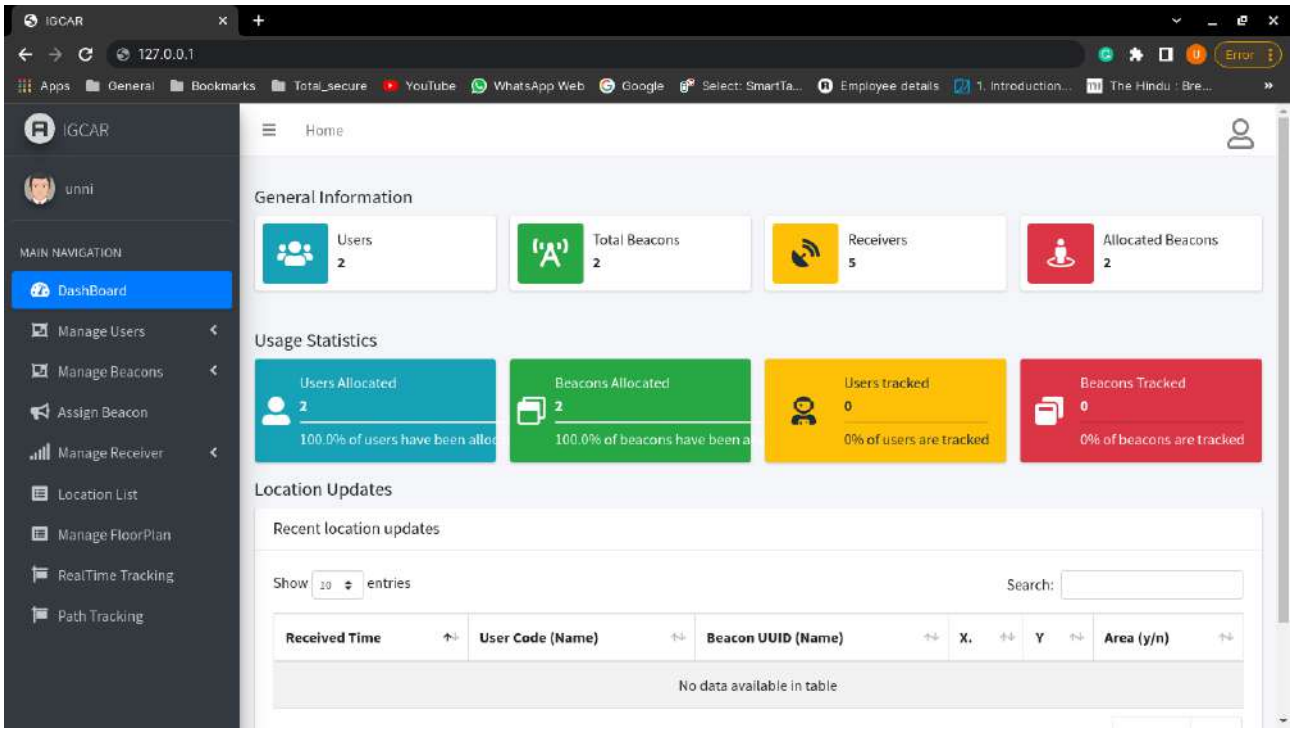
For entering into poweroff mode press the button in the scanner board until LED 5 starts blinking fastly.

3. POWER OFF Mode

Simply press the button to go to poweroff mode.

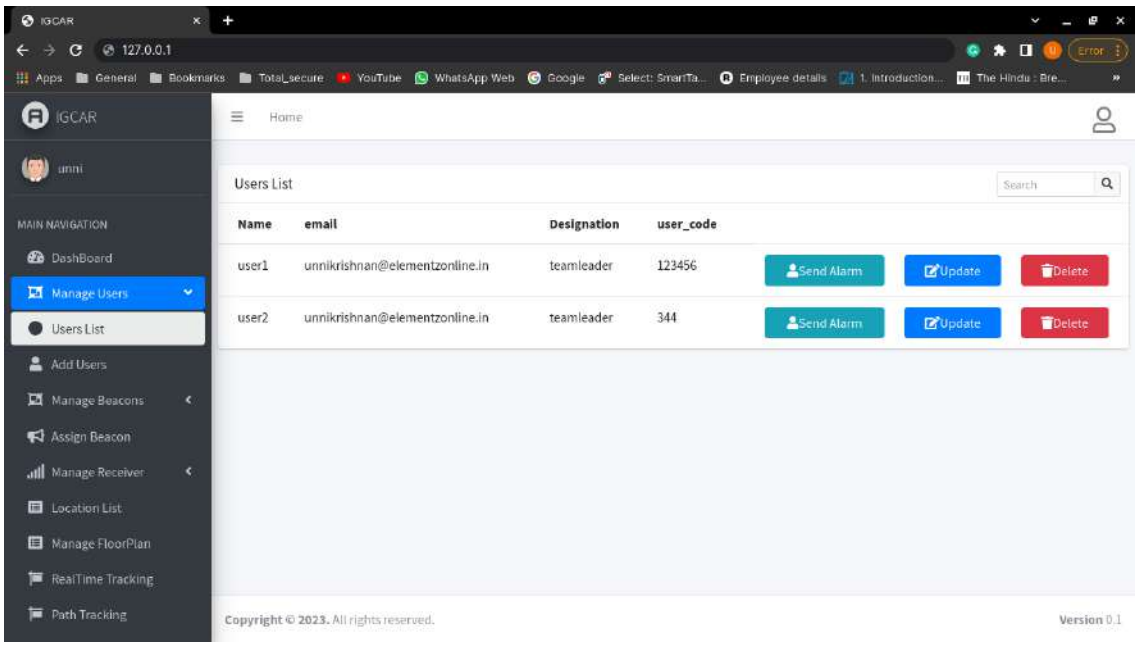
Web interface Documentation

1. Dashboard

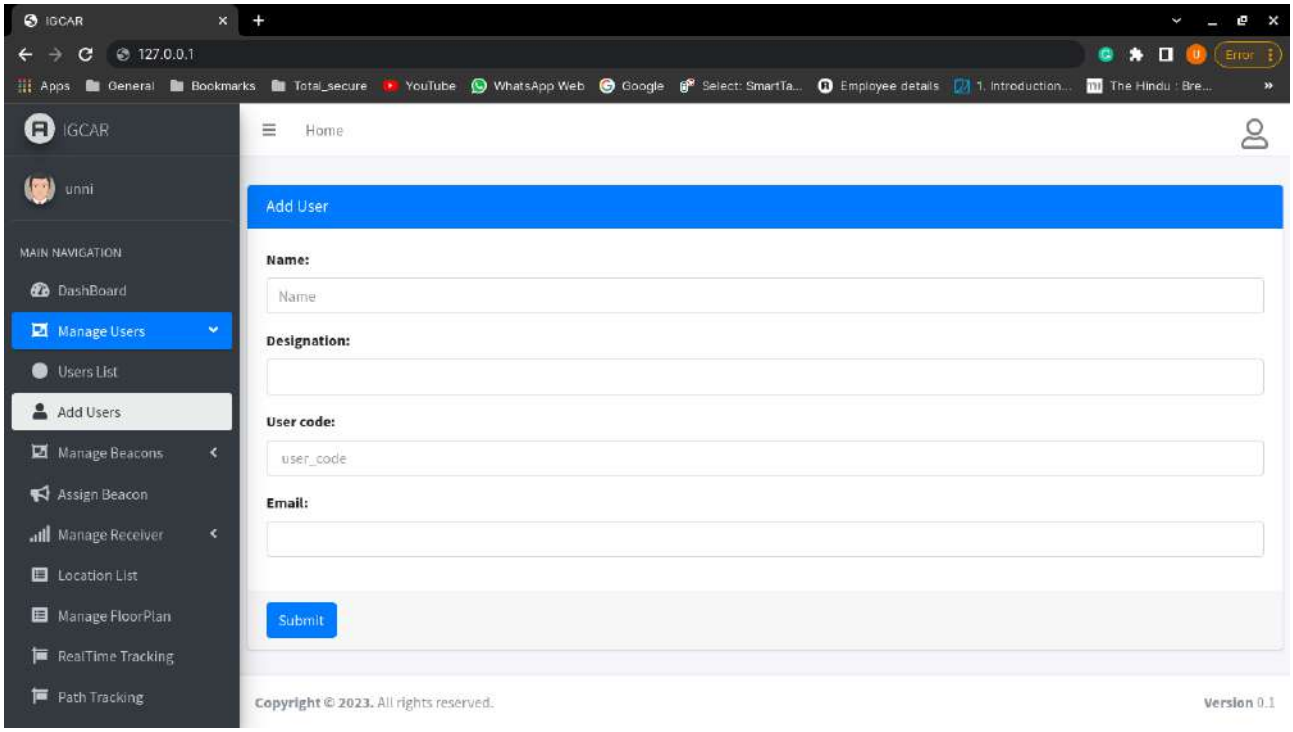


From the dashboard we will get
1. Number of beacons added
2. Number of scanners added
3. Number of users tracked
4. Number of beacons tracked

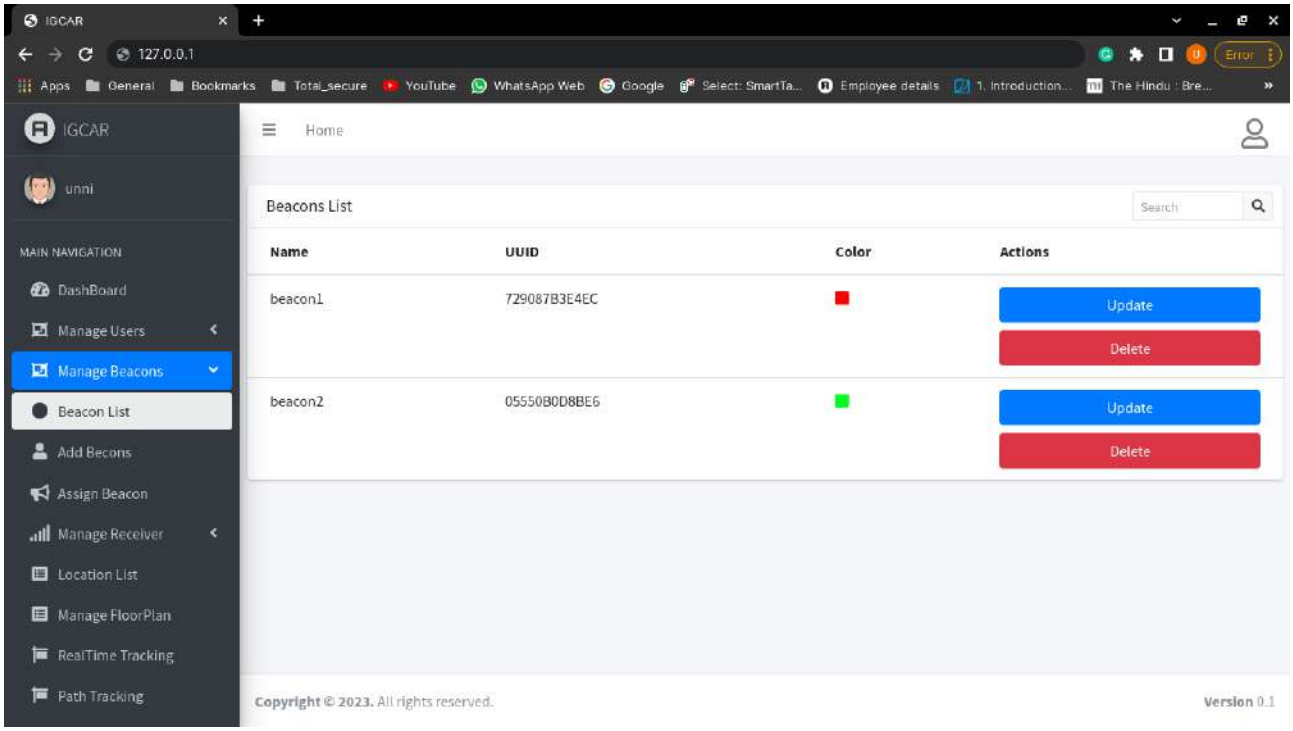
2. List of users added



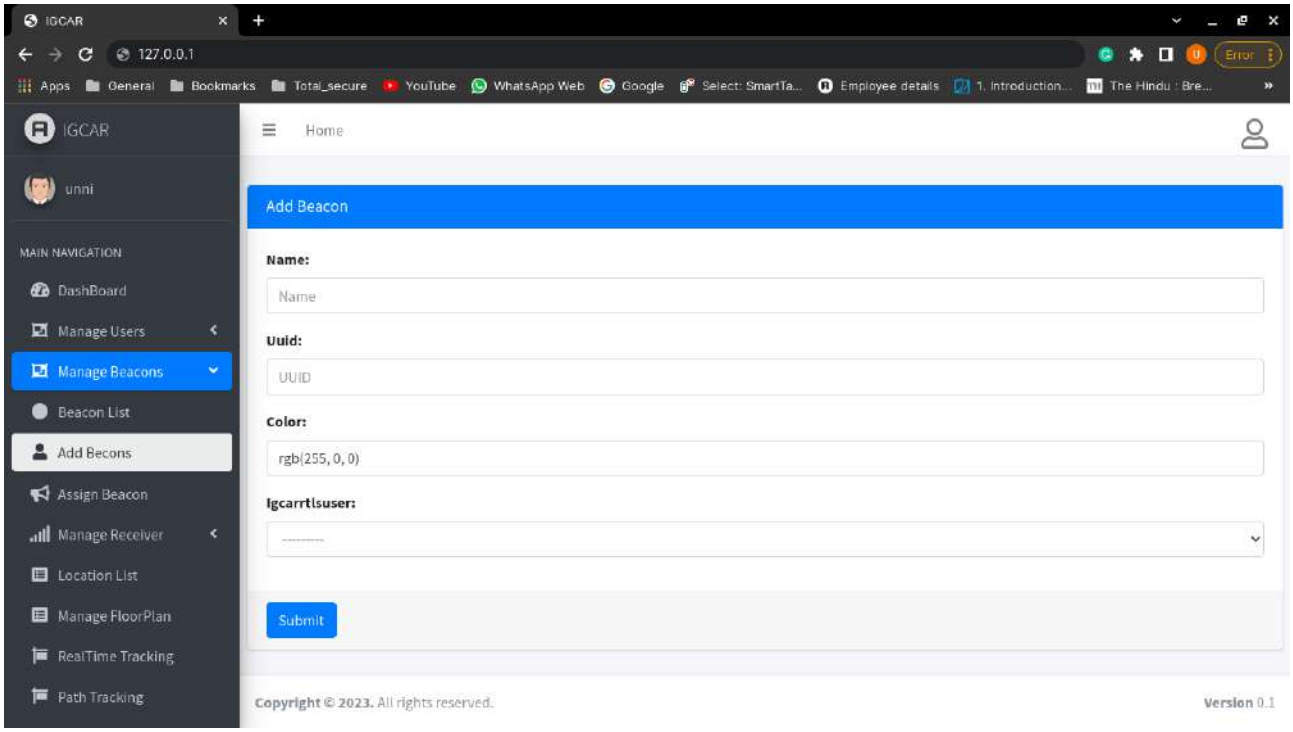
3. Add users



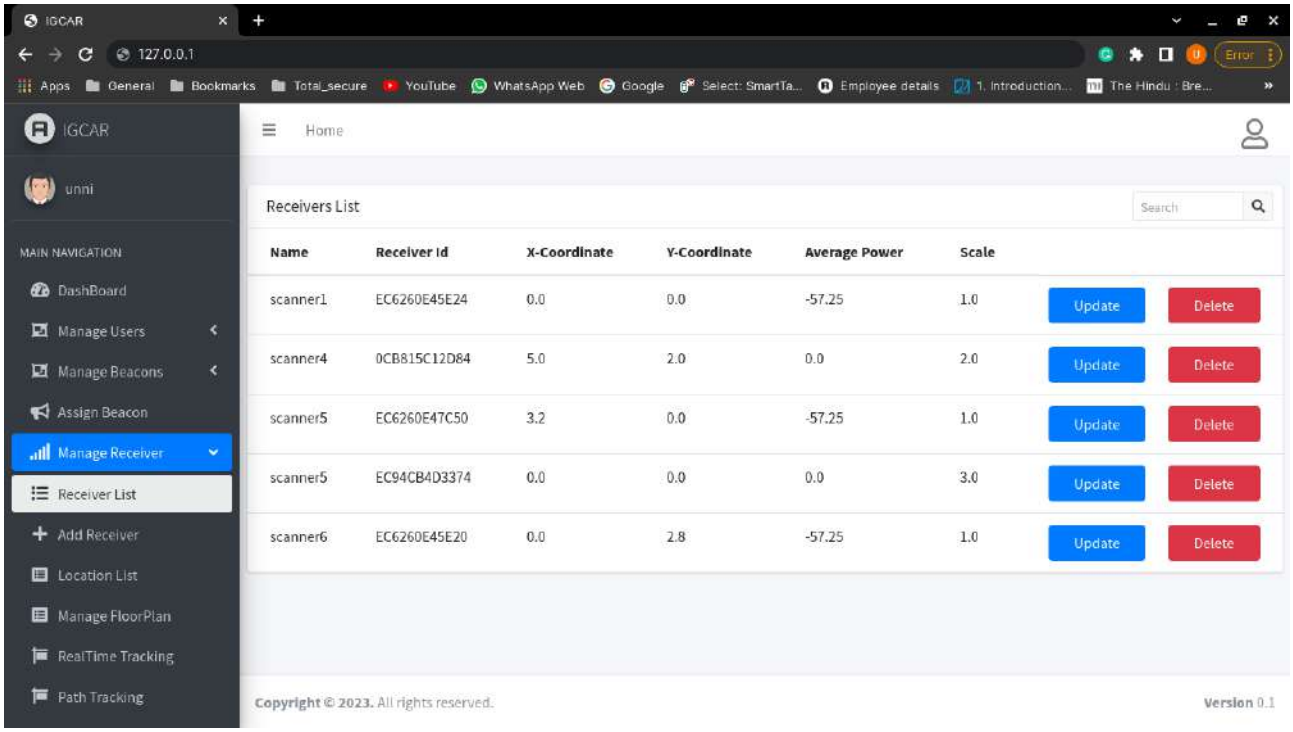
4. List of beacons added



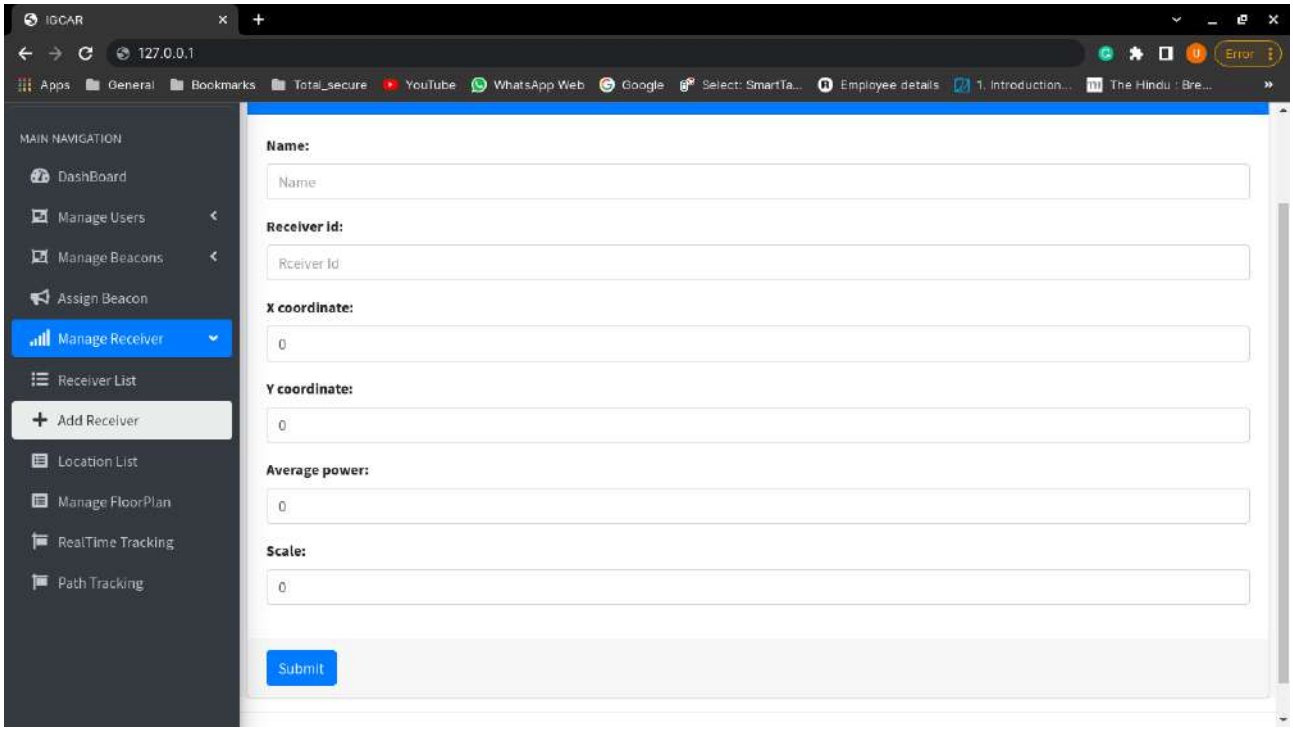
5. Add beacons



6. List of receivers

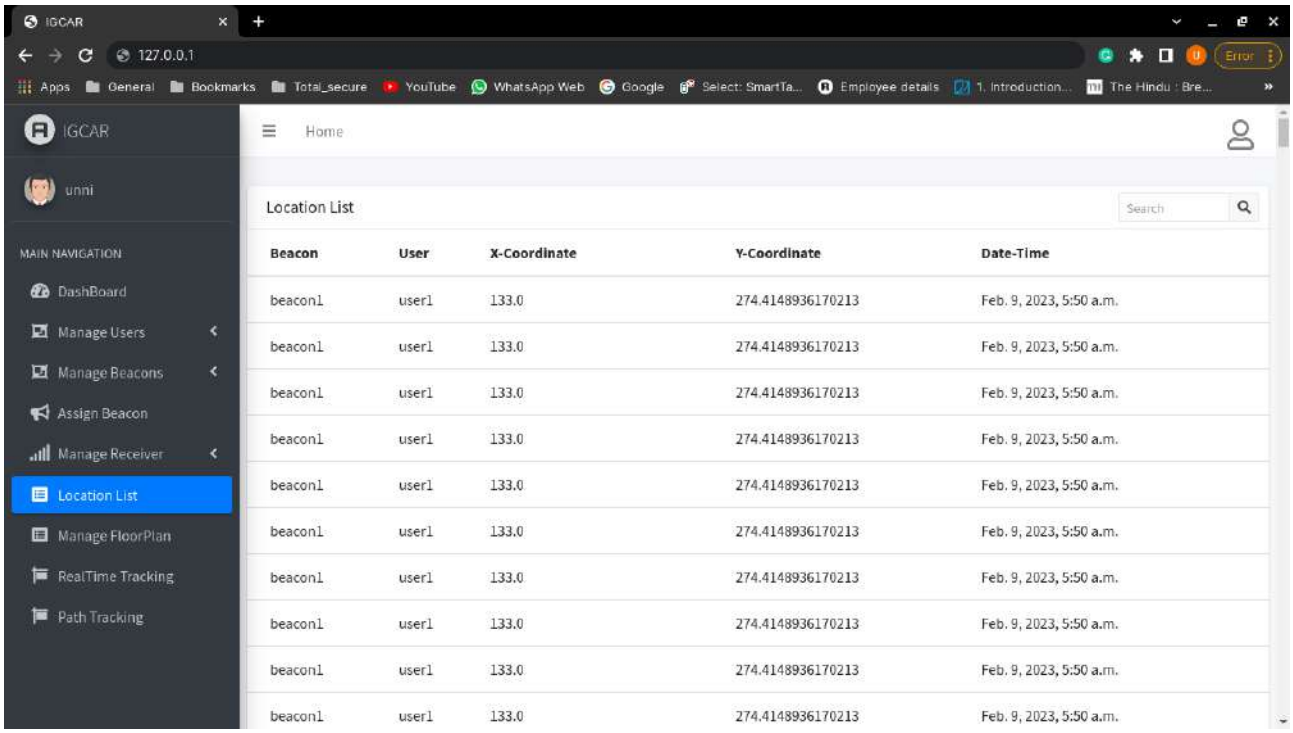


7. Add Receivers



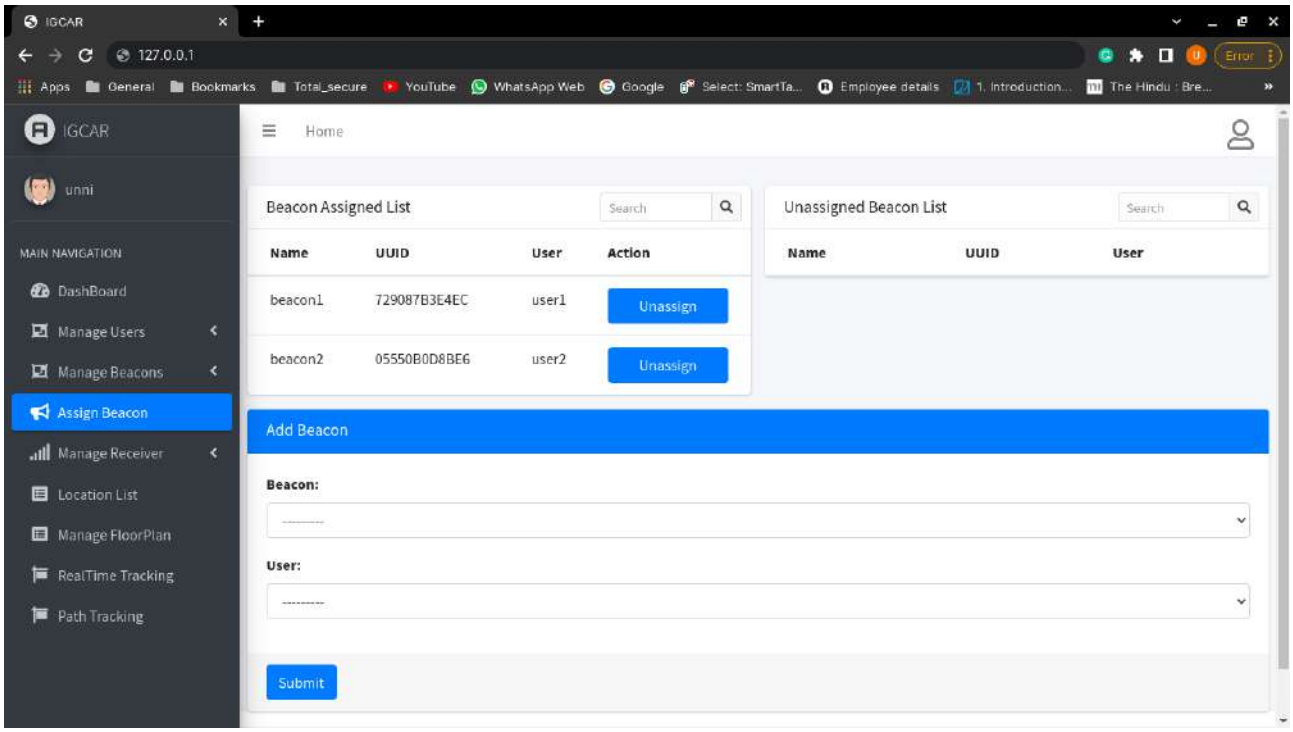
8. Location list

Location of all the users are listed here



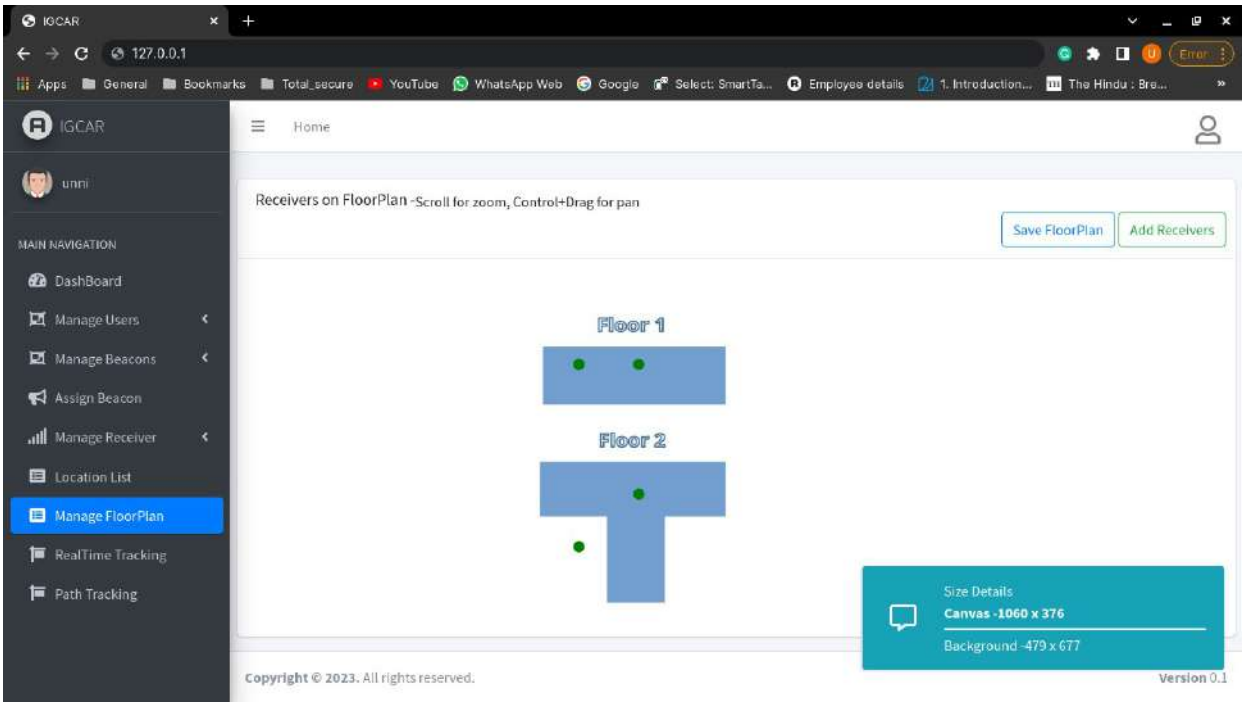
8. Assign beacon

Here we can assign user to beacon by selecting the user and beacon and also unassign

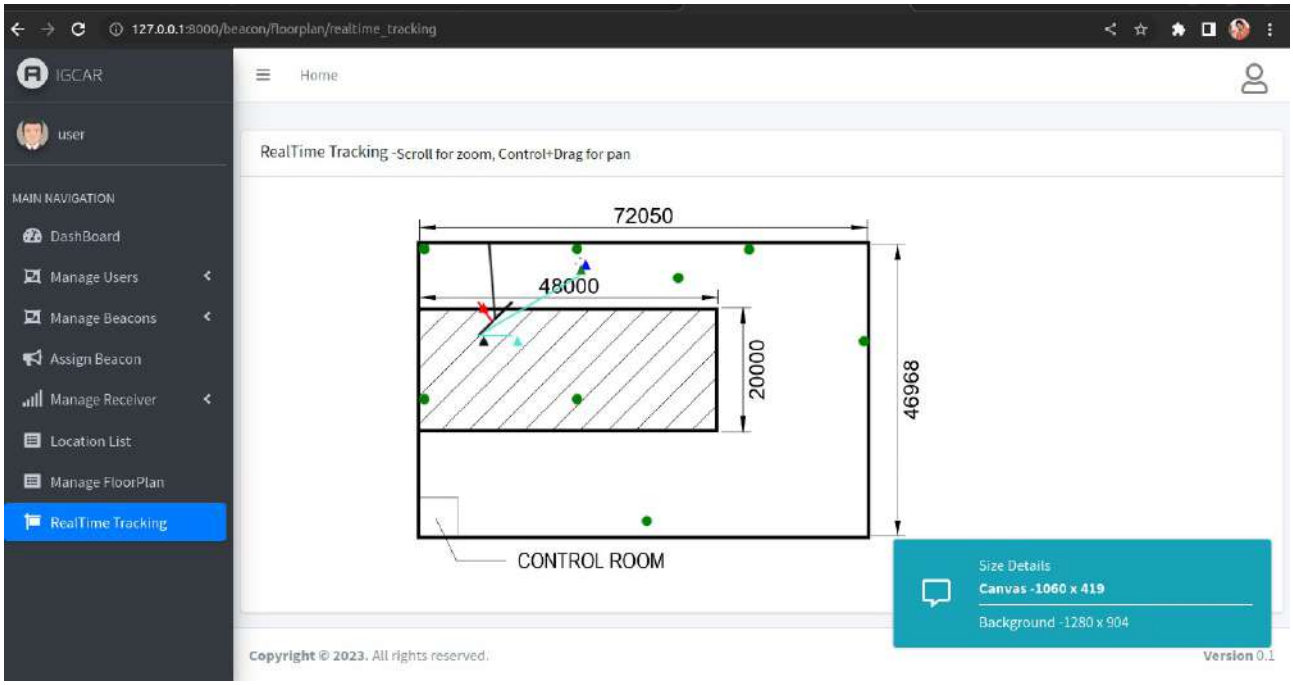


9. Manage Floor plans

Setting the scanner in specified location map can be done in two ways
1. By giving the cordinates in the scanner added tab
2. Move the scanner to specific location using mouse pointer in the Mange floor plans.



10. Real time tracking



11. Path tracking

Path of the user can traced here. The time span can be given as input.