

# **INDOOR PERSON LOCATOR**

## **GSTian Locator**

Submitted in partial fulfillment of the requirements

of the degree of

Bachelor of Engineering

in

Information Technology

by

- |                      |          |
|----------------------|----------|
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2021-2022

## **CERTIFICATE**

This is to certify that the IoE Mini project entitled “**INDOOR PERSON LOCATOR**” is a bonafide work of the following students, submitted to the University of Mumbai in partial fulfillment of the requirement for the award of the degree of **Bachelor of Engineering** in **Information Technology**.

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## PROJECT REPORT APPROVAL

This IoE Mini project report entitled *Indoor Person Locator* by the following students is approved for the degree of *Bachelor of Engineering in Information Technology*.

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Name of Internal Examiner: -----

Signature:-----

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Place:

## **DECLARATION**

I declare that this written submission represents my ideas in my own words and where others ideas or words have been included, I have adequately cited and referenced the original sources. I also declare that I have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in my submission. I understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

Rohit Viramani	118A3045
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Shweta Deepak Pai	219A3069

Date:

## **ACKNOWLEDGEMENT**

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Also, we would like to thank the entire faculty of the Information Technology Department for their valuable ideas and timely assistance in this project, last but not the least, we would like to thank our non-teaching staff members of our college for their support, in facilitating timely completion of this project.

### **Project Team**

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Upade Arfah Mubin	118A3060
Shweta Deepak Pai	219A3069

## **ABSTRACT**

Indoor location, navigation, and mapping are one of the most interesting and growing fields of research in areas of Localization using IoE. From the above mentioned, this project focuses on locating the indoor position of a human entity within a given space (college campus). The use of sensors embedded in mobile phones as well as Bluetooth modules and an Arduino board, placed within a specific room, at different points in the campus, which will pass information to a remote database such as Firebase, enables one to locate a person in the proximity of the sensors. Along with this our proposed system plans to have features of identifying a change in position due to movement and distance & time calculation in order to reach the person. The whole inspiration for this project stems from the frustrating and tiring experience of not being able to find the right individual(s) at the right time. In traditional methods, this would require one to call or message the person and wait for the person to respond and reach the required destination or ask other people where the individual(s) might be. To avoid this, an Android application is proposed that would enable users to know their current location, search the location of a particular person and also see a list of the people who searched for them during that day. The future scope of this entire project would definitely include navigation and mapping services which would not only improve the experience of the user but would also contribute to creating an actual system deployed on the campus, leading to an understanding of how localization techniques work and how one can contribute with new methods.

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# Chapter 1

## Introduction:

Indoor location, navigation, and mapping are one of the most interesting and growing fields of research in areas of Localization using IoE. From the above mentioned, this project focuses on locating the indoor position of a human entity within a given space (college campus).

The use of sensors embedded in mobile phones as well as Bluetooth modules and an Arduino board, placed within a specific room, at different points in the campus, which will pass information to a remote database such as Firebase, enables one to locate a person in the proximity of the sensors. Along with this our proposed system plans to have features of identifying a change in position due to movement and distance & time calculation in order to reach the person.

The whole inspiration for this project stems from the frustrating and tiring experience of not being able to find the right individual(s) at the right time. In traditional methods, this would require one to call or message the person and wait for the person to respond and reach the required destination or ask other people where the individual(s) might be. To avoid this, an Android application is proposed that would enable users to know their current location, search the location of a particular person and also see a list of the people who searched for them during that day.

The future scope of this entire project would definitely include navigation and mapping services which would not only improve the experience of the user but would also contribute to creating an actual system deployed on the campus, leading to an understanding of how localization techniques work and how one can contribute with new methods.



## Chapter 2

### REVIEW OF LITERATURE:

[1]	Chammi Graphics Studio, "How to connect HC-05 Bluetooth Module  Bluetooth module not recognized by mobile phone," YouTube. Jun. 03, 2020. Accessed: Apr. 10, 2022. [YouTube Video]. Available: <a href="https://www.youtube.com/watch?v=thptX9w0Oy0">https://www.youtube.com/watch?v=thptX9w0Oy0</a>	This video, allowed us to see what is the method to connect an HC-05 Bluetooth Module to our phones. Also talks about how to fix errors, when an unsuccessful connection is made.
[2]	Tech, "Working on Bluetooth in Android and getting list of paired devices into listview," YouTube. Jun. 09, 2018. Accessed: Apr. 10, 2022. [YouTube Video]. Available: <a href="https://www.youtube.com/watch?v=3Xcn3IlvSj8">https://www.youtube.com/watch?v=3Xcn3IlvSj8</a>	Demonstration of getting all Bluetooth paired devices in a ListView element in Android Studio, using Java & XML.
[3]	"Add Firebase to your Android project   Firebase Documentation," Firebase, 2022. <a href="https://firebase.google.com/docs/android/setup">https://firebase.google.com/docs/android/setup</a> (accessed Apr. 10, 2022).	Documentation of installation and utilization of the cloud database, Firebase, in Android Studio, for storage, retrieval and updating of information

## Chapter 3

### Report on the Present Investigation:

In the current state of the project we have successfully implemented a working link between the physical devices and the server, i.e the Arduino Board, HC-05 Bluetooth module, Mobile Phones and the FireBase backend with the Android App.

The Hardware and Software Requirements are as follows:

#### **Hardware Requirements:**

1. HC-05 Bluetooth Module
2. Arduino Uno
3. Jumper Wires
4. Smartphone

#### **Software Requirements:**

1. Android Studio
2. Figma

We have also calculated the minimum cost of all the components, which is ₹960 per system in a single room, hence as this system will be installed in all rooms of the facility, the final cost will be: No. of rooms x total of 1 system; And we look forward to implementing the future scope stated in the proposed system and add more modules in the current system, like indoor mapping, etc.

## **Chapter 4**

### **Study of various target boards:**

#### **4.1 Arduino:**

Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online. You can tell your board what to do by sending a set of instructions to the microcontroller on the board. To do so you use the Arduino programming language (based on Wiring), and the Arduino Software (IDE), based on Processing.

#### **4.2 HC-05 Bluetooth Module:**

HC-05 Bluetooth Module is an easy-to-use Bluetooth SPP (Serial Port Protocol) module, designed for a transparent wireless serial connection setup. Its communication is via serial communication which makes an easy way to interface with a controller or PC. HC-05 Bluetooth module provides a switching mode between master and slave mode which means it is able to use neither receiving nor transmitting data.

## Chapter 5

### Report on Proposed system and its implementation:

#### 5.1 Proposed System:

Indoor person locator is an application that helps the user to locate himself to a particular location inside the campus. Currently, there is no application on our college campus that will help the students and teachers to locate the person they are in search of. The main purpose of this application is to find the right people at the right time with ease. It is designed for the students of our college who are not able to find their friends or teachers on time, during submissions, or during the college fests, this application makes it easy to find friends, teachers, and other members on large campuses.

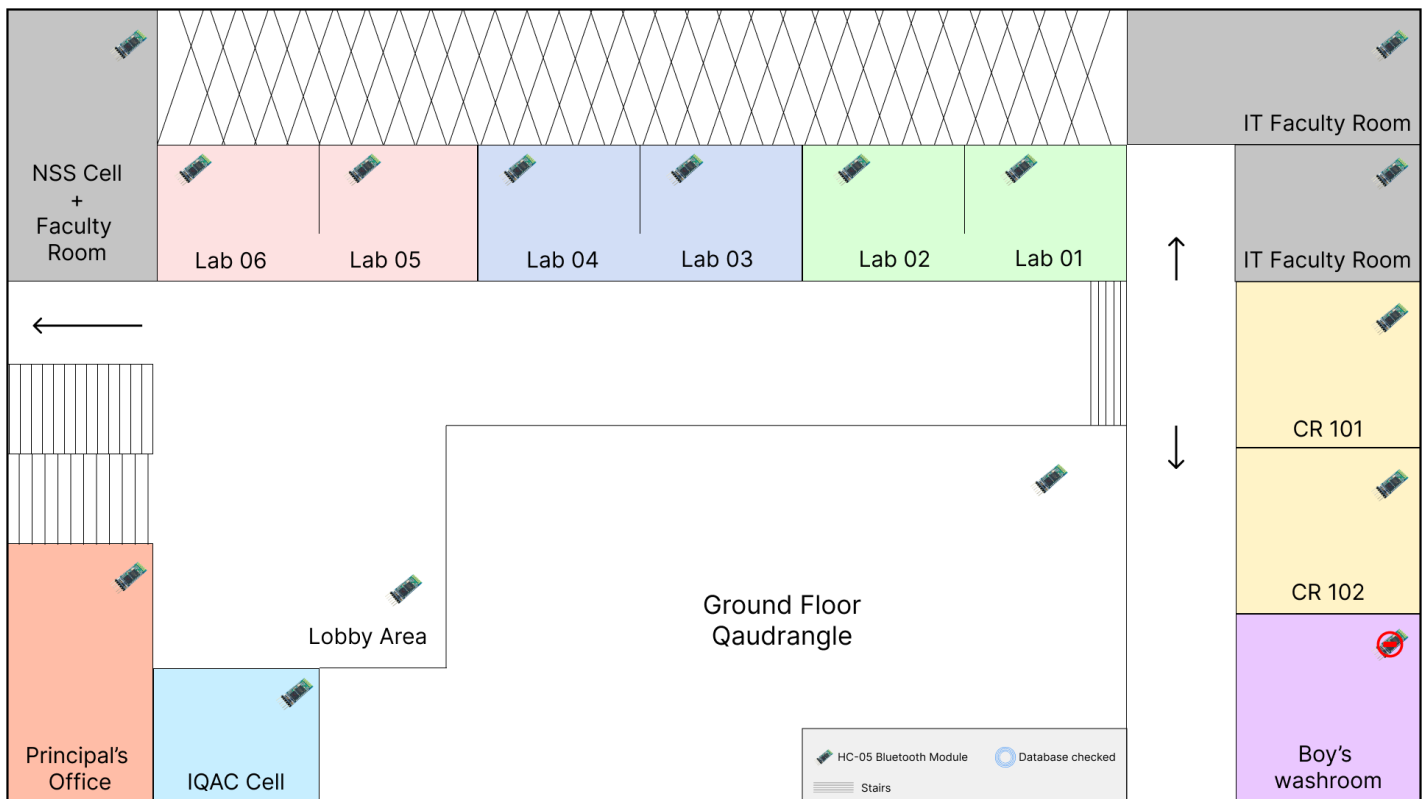


Fig 1. Floor plan with proposed placements of Bluetooth modules

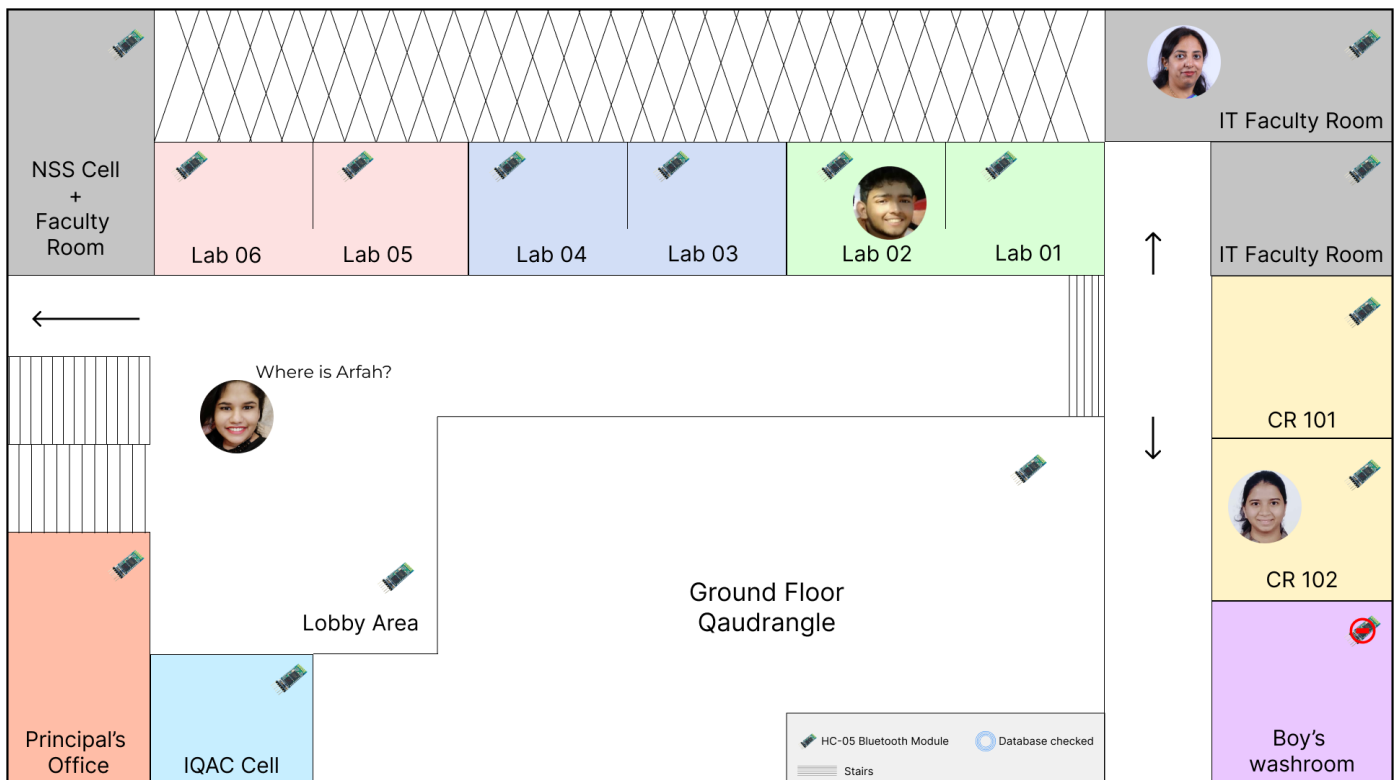
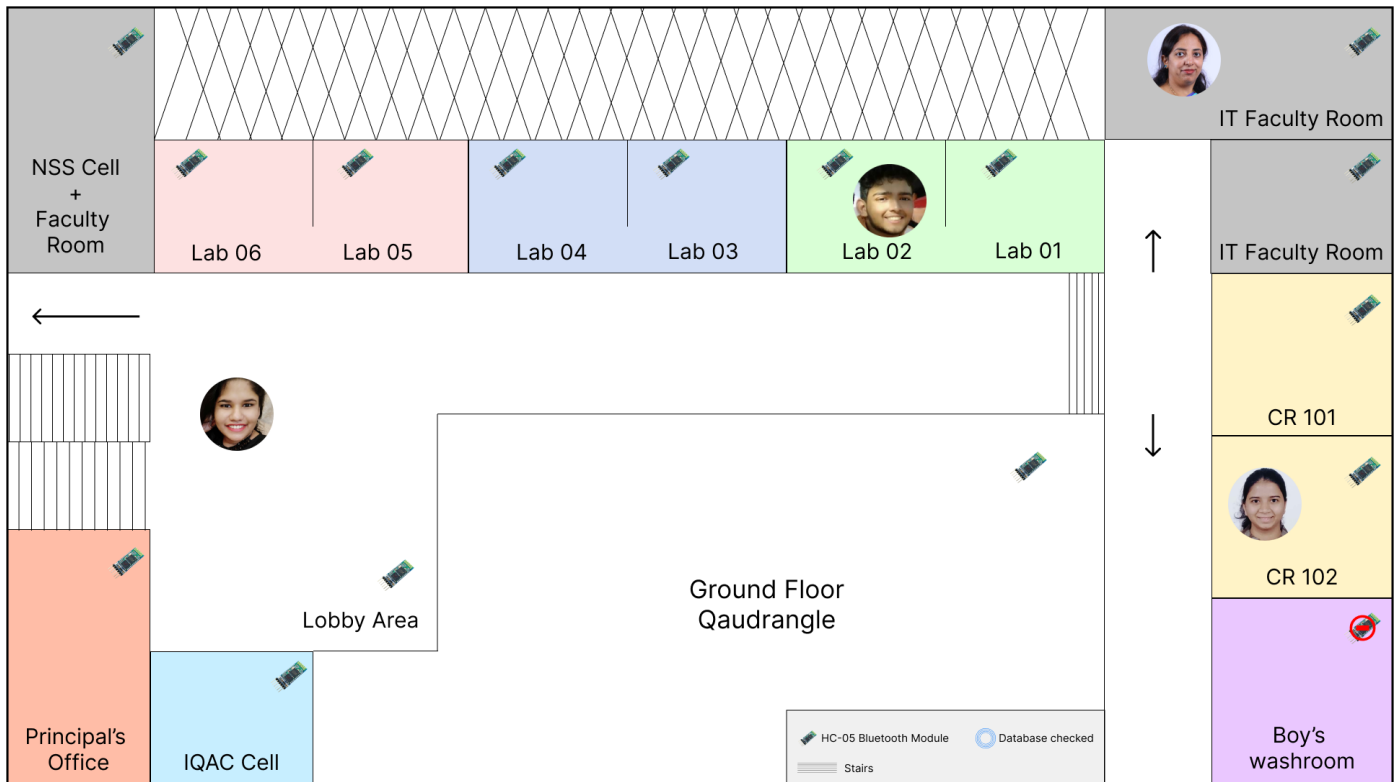


Fig. 3 User searches for a particular individual

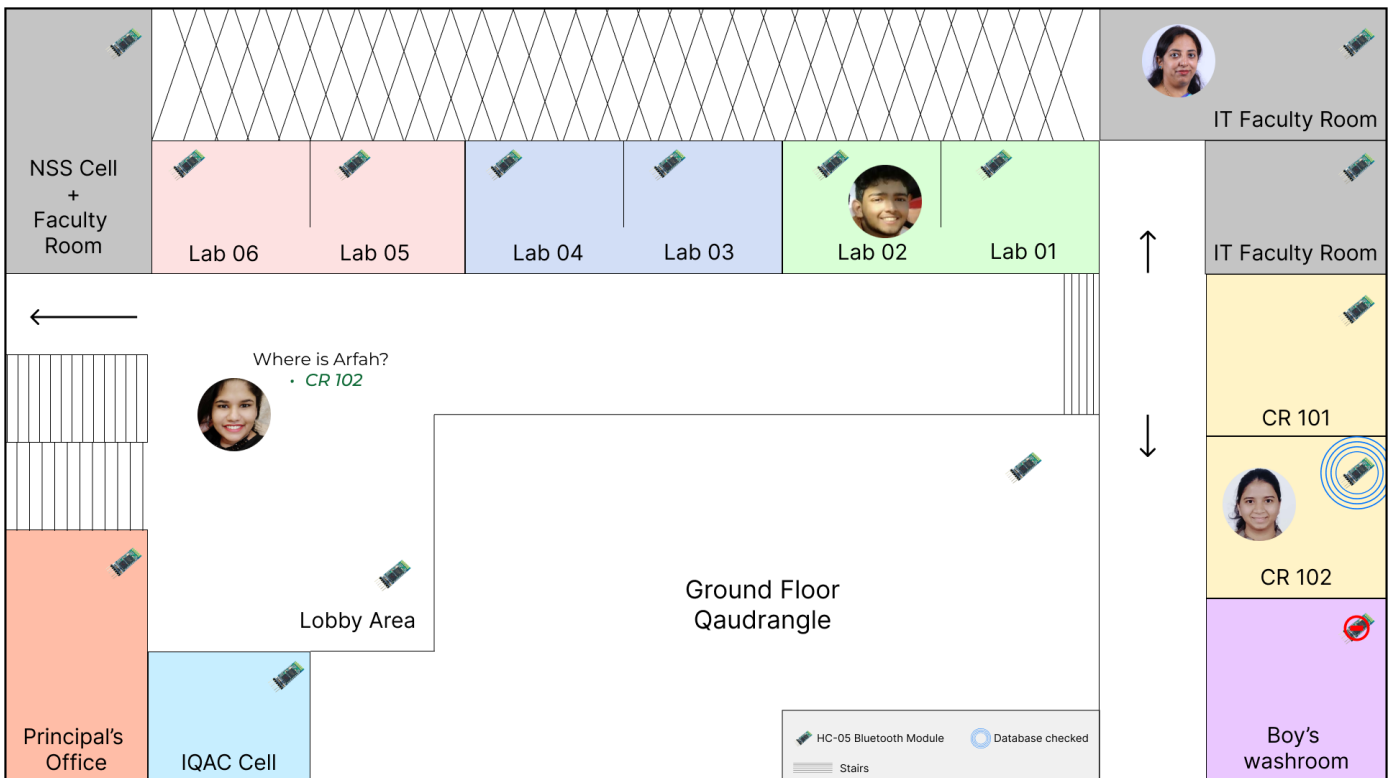
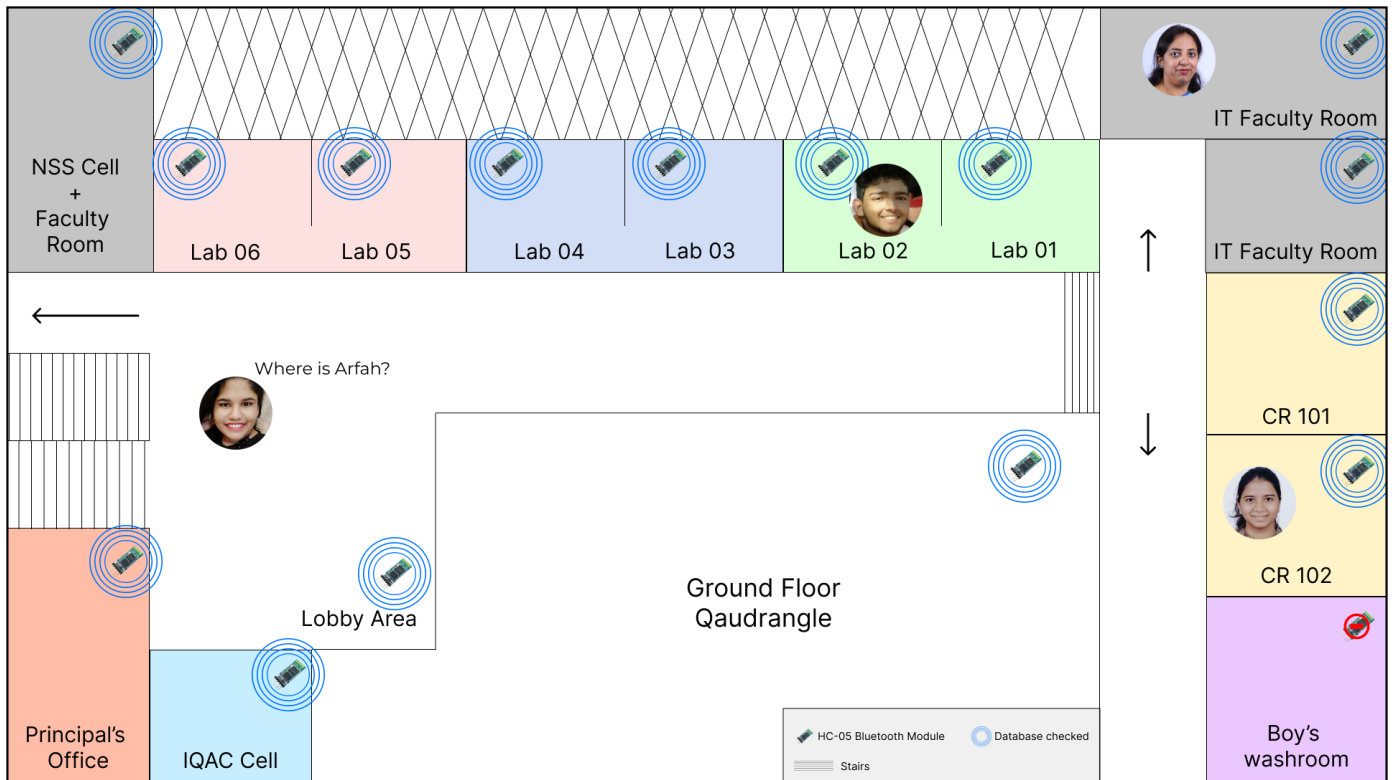


Fig. 4 & 5 Database data accumulated from all sensors, checked. Success message with the location of individual sent to user

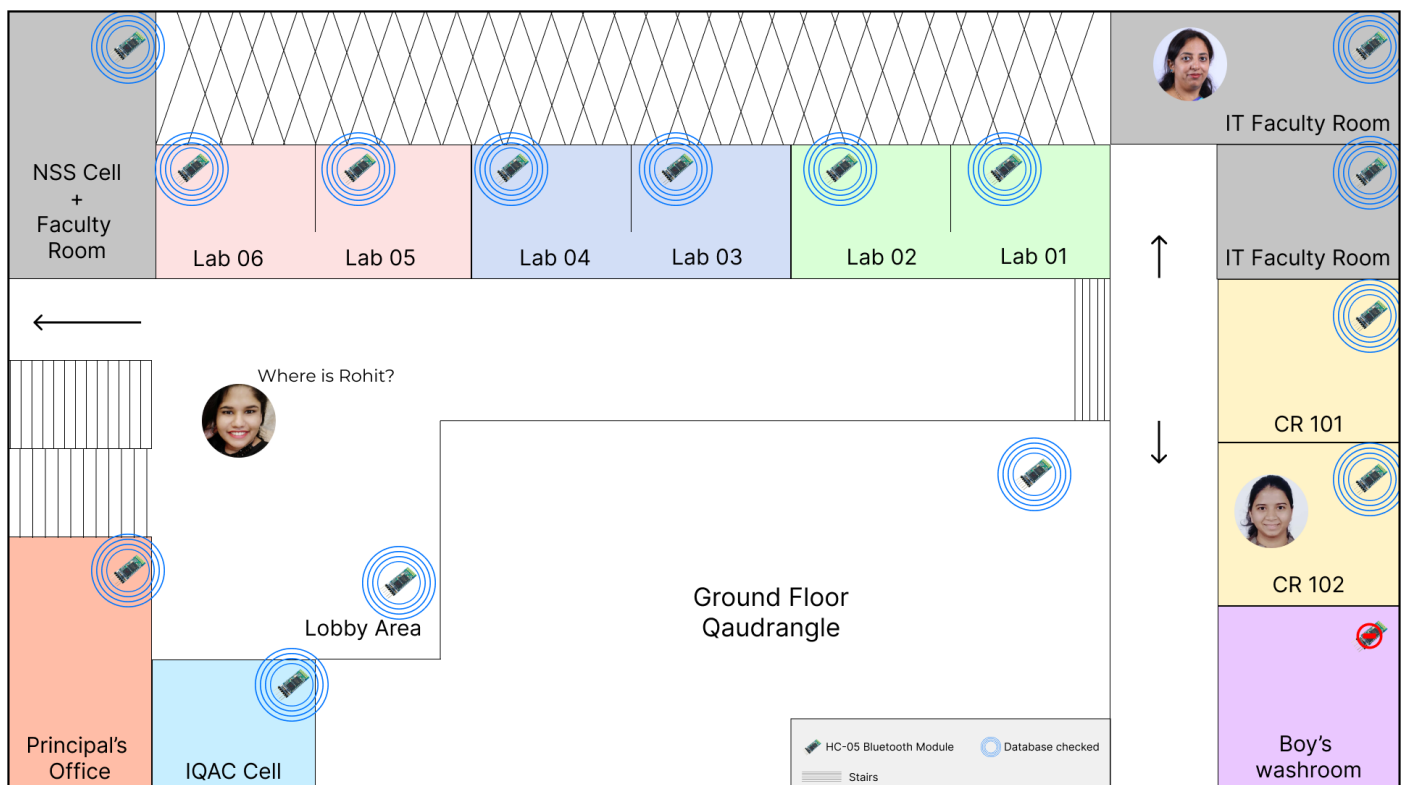
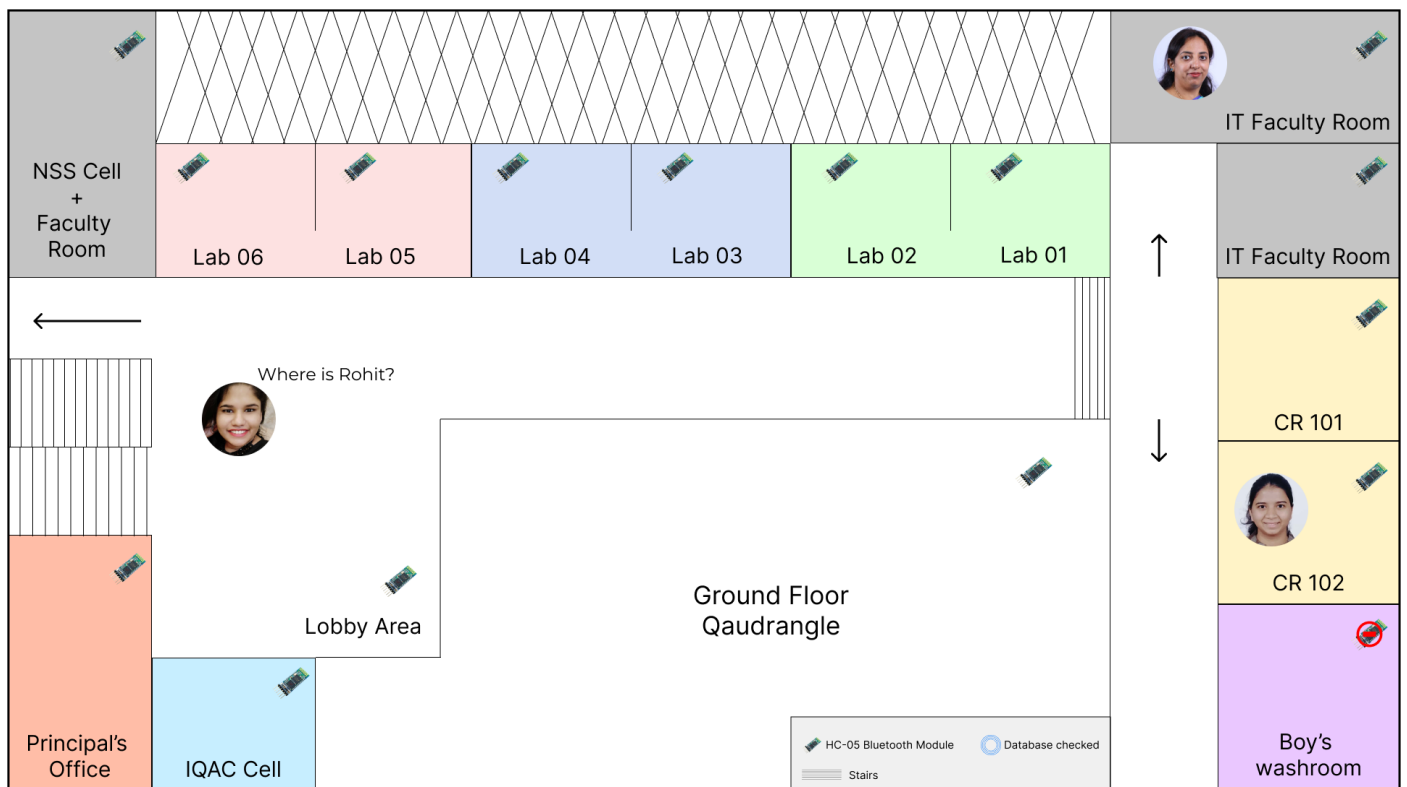


Fig. 6 & 7 Rohit is not in the building. User searches for Rohit

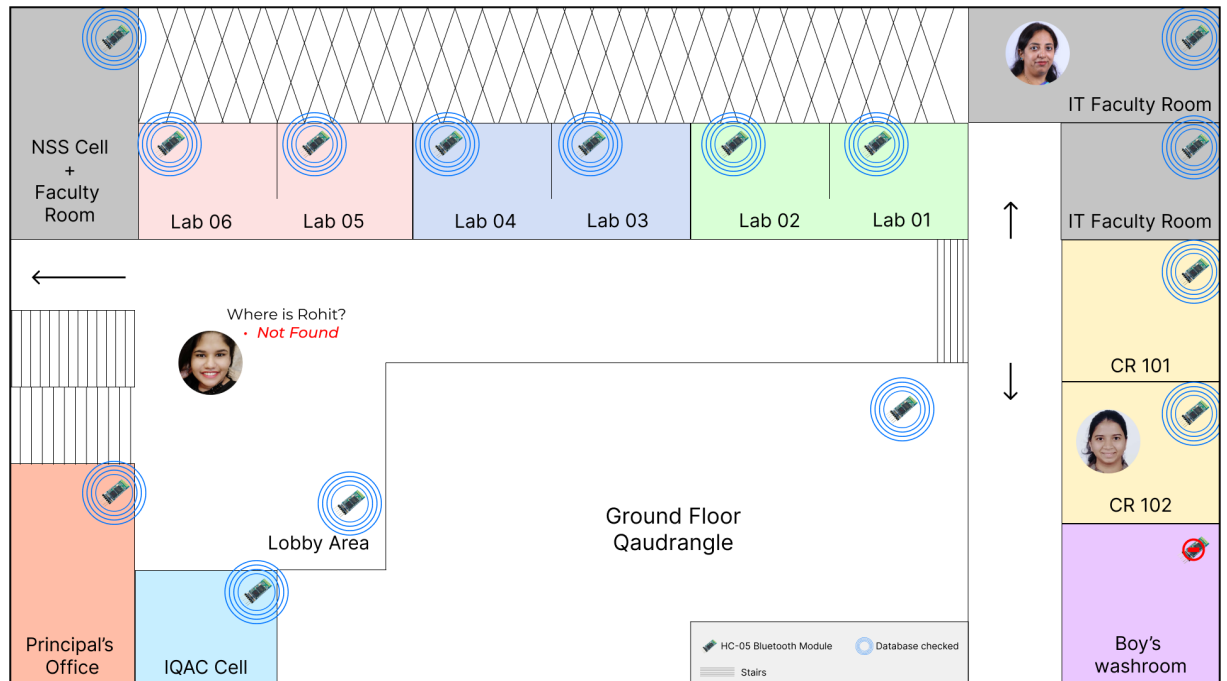
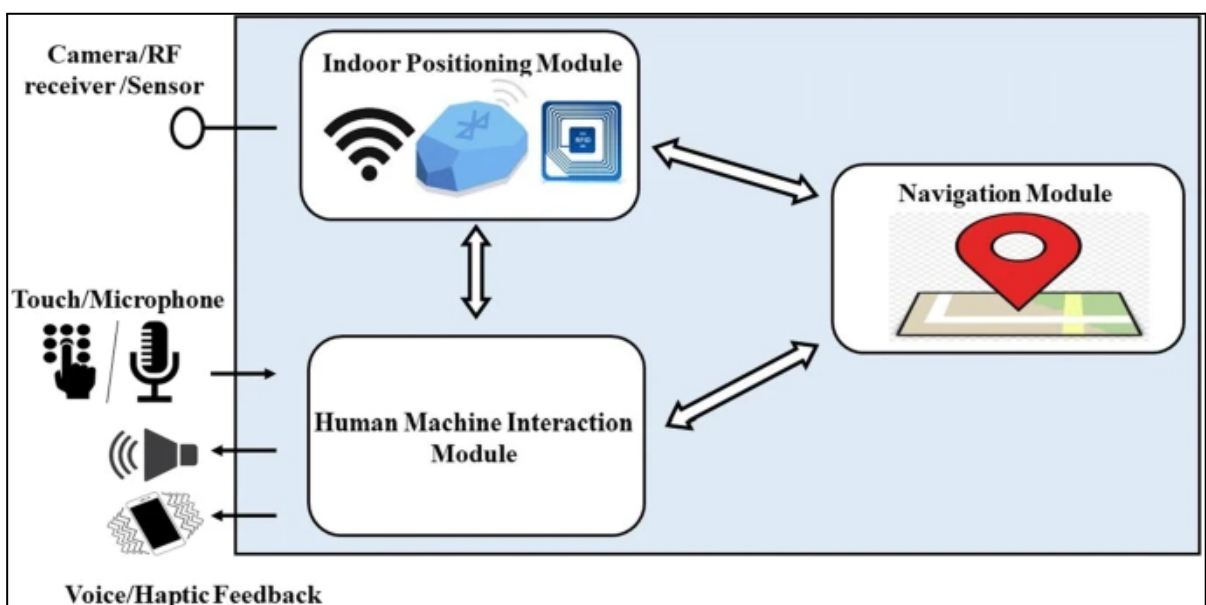


Fig 8. Message sent to the user that he is not in the building

## 5.2 Implementation:

The key feature of this application is it helps in locating where and when the person is, and if he/she is present inside the campus or not. This is done through a large number of Bluetooth devices being spread out inside the college campus thus, finding the location of the person through a Bluetooth device near to the person. All the sensors connected to the Arduino UNO board are connected through the HC-05 Bluetooth module which shows the output in the mobile connected to it. We are able to see the paired devices in the output and are able to search for a person we are looking for through a search bar. If the name of the person is found in a database nearby to any Bluetooth device then the person is located in that particular place.





## Chapter 6

### Code:

#### HomeScreen.java

```
package com.example.indoor_navigation_new;
import androidx.annotation.NonNull;
import androidx.appcompat.app.AppCompatActivity;
import androidx.core.app.ActivityCompat;

import android.Manifest;
import android.bluetooth.BluetoothAdapter;
import android.bluetooth.BluetoothDevice;
import android.bluetooth.BluetoothManager;
import android.content.Intent;
import android.content.pm.PackageManager;
import android.os.Bundle;
import android.util.Log;
import android.widget.AdapterView;
import android.widget.AdapterView.OnItemClickListener;
import android.widget.ArrayAdapter;
import android.widget.ListAdapter;
import android.widget.ListView;
import android.widget.Toast;

import com.google.android.gms.tasks.OnFailureListener;
import com.google.android.gms.tasks.OnSuccessListener;
import com.google.firebase.database.DataSnapshot;
import com.google.firebase.database.DatabaseError;
import com.google.firebase.database.DatabaseReference;
import com.google.firebase.database.FirebaseDatabase;
import com.google.firebase.database.ValueEventListener;

import java.util.ArrayList;
import java.util.HashMap;
import java.util.List;
import java.util.Map;
import java.util.Set;

public class HomeScreen extends AppCompatActivity {
    private static final int REQUEST_ENABLE_BT = 0;
    ListView listView;
    BluetoothAdapter adapter;
    BluetoothManager manager;
```

```

List savedList;
Set<BluetoothDevice> pairedDevices;

        FirebaseDatabase          database          =
FirebaseDatabase.getInstance("https://indoor-navigation-new-866e0-default-rtdb.firebaseio.com/");
DatabaseReference ref = database.getReference().child("User");;
int maxid=0;
BluetoothDevice result;
String name;
String deviceName = "HC-05_LAB 1";
String dev = "HC-05";
String result1 = null;

@Override
protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_home_screen);

    listView = findViewById(R.id.ListView);

    manager = (BluetoothManager) getSystemService(BLUETOOTH_SERVICE);
    adapter = manager.getAdapter();
    savedList = new ArrayList();

    HomeScreen homeScreen = new HomeScreen();

    if (manager == null) {
        if (ActivityCompat.checkSelfPermission(this, Manifest.permission.BLUETOOTH_CONNECT) !=
PackageManager.PERMISSION_GRANTED) {
            // TODO: Consider calling
            //    ActivityCompat#requestPermissions
            // here to request the missing permissions, and then overriding
            //    public void onRequestPermissionsResult(int requestCode, String[] permissions,
            //                                           int[] grantResults)
            // to handle the case where the user grants the permission. See the documentation
            // for ActivityCompat#requestPermissions for more details.
            return;
        }
        Toast.makeText(this, "error: bluetooth not supported", Toast.LENGTH_LONG).show();
    }else if(!adapter.isEnabled()) {
        Intent enableBluetoothIntent = new Intent(BluetoothAdapter.ACTION_REQUEST_ENABLE);
        startActivityForResult(enableBluetoothIntent, REQUEST_ENABLE_BT);

        adapter.enable();
    }
}

```

```

pairedDevices = adapter.getBondedDevices();

if(adapter.isEnabled()) {

    Adapter adapter1 = new ArrayAdapter<>(this, android.R.layout.simple_list_item_1,
savedList);
    listView.setAdapter((ListAdapter) adapter1);

    Toast.makeText(this, "This are your paired devices", Toast.LENGTH_SHORT).show();

    result = null;
    name = adapter.getName();

    for (BluetoothDevice bt : pairedDevices) {
        // System.out.println(bt.getName());
        savedList.add(bt.getName());
        if(bt.getName().contains(dev)) {
            result = bt;
            String[] rdev = deviceName.split("_",-2);
            for (String s: rdev)
                result1 = s;

            // Firebase Insertion

            ref.child("Users").addListenerForSingleValueEvent(new ValueEventListener() {
                @Override
                public void onDataChange(DataSnapshot dataSnapshot) {
                    insertData();
                }

                @Override
                public void onCancelled(DatabaseError databaseError) {

                }
            });
        }
    }
}else{
    Toast.makeText(this, "Please restart your application", Toast.LENGTH_SHORT).show();
}

}else if(adapter.isEnabled()) {
    if (ActivityCompat.checkSelfPermission(this, Manifest.permission.BLUETOOTH_CONNECT) ==
PackageManager.PERMISSION_GRANTED) {

```

```

        return;
    }
    adapter.enable();

    pairedDevices = adapter.getBondedDevices();

    Adapter adapter1 = new ArrayAdapter<>(this, android.R.layout.simple_list_item_1, savedList);
    listView.setAdapter((ListAdapter) adapter1);

    result = null;
    name = adapter.getName();

    for (BluetoothDevice bt : pairedDevices) {
        // System.out.println(bt.getName());
        savedList.add(bt.getName());
        if(bt.getName().contains(dev)) {
            result = bt;
            String[] rdev = deviceName.split("_",-2);
            for (String s: rdev)
                result1 = s;

            // Firebase Insertion

            ref.child("Users").addListenerForSingleValueEvent(new ValueEventListener() {
                @Override
                public void onDataChange(DataSnapshot dataSnapshot) {

                    if(dataSnapshot.child(name).exists()){
                        System.out.println("Welcome back");
                        Toast.makeText(getApplicationContext(), "Welcome Back.",
                            Toast.LENGTH_SHORT).show();
                    } else {
                        insertData();
                    }
                }
            })

            @Override
            public void onCancelled(DatabaseError databaseError) {

            }
        }
    }
}
}
}
}

```

```

public void onActivityResult(int requestCode, int resultCode, Intent result) {
    super.onActivityResult(requestCode, resultCode, result);
    if (requestCode == REQUEST_ENABLE_BT) { // Match the request code
        if (resultCode == RESULT_OK) {
            Toast.makeText(this, "Bluetooth Turned on", Toast.LENGTH_LONG).show();
        } else { // RESULT_CANCELED
            Toast.makeText(this, "error: turning on bluetooth", Toast.LENGTH_LONG).show();
        }
    }
}

private void insertData(){
    String UserName = name.toString();
    String DeviceName = deviceName.toString();

    HashMap<String, String> user_data = new HashMap<>();
    user_data.put("name", UserName);
    user_data.put("devicename", result1);

    ref.push().setValue(user_data);
    System.out.println("INSERTED");

    Intent homeIntent = new Intent(HomeScreen.this, Search_bar.class);
    startActivity(homeIntent);
    finish();
}

class Users {

    public String name, devicename;

    public Users(){

    }

    public String getName() {
        return name;
    }

    public String getDeviceName() {
        return devicename;
    }
}

```

```
public void setName(String name) {  
    name = name;  
}  
  
public void setDeviceName(String Devicename) {  
    devicename = Devicename;  
}  
  
public Users(String Name, String Devicename) {  
    name = Name;  
    devicename = Devicename;  
}  
}  
  
}
```

## **Activity\_home\_screen.xml**

```
<?xml version="1.0" encoding="utf-8"?>

<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".HomeScreen">

    <ListView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:id="@+id/ListView" />

</RelativeLayout>
```

## Search\_bar.java

```
package com.example.indoor_navigation_new;

import android.os.Bundle;
import android.util.Log;
import android.view.View;
import android.widget.AdapterView;
import android.widget.AdapterView.OnItemClickListener;
import android.widget.AutoCompleteTextView;
import android.widget.ImageButton;
import android.widget.ListView;
import androidx.annotation.NonNull;
import androidx.appcompat.app.AppCompatActivity;
import com.google.firebase.database.DataSnapshot;
import com.google.firebase.database.DatabaseError;
import com.google.firebase.database.DatabaseReference;
import com.google.firebase.database.FirebaseDatabase;
import com.google.firebase.database.Query;
import com.google.firebase.database.ValueEventListener;
import java.util.ArrayList;

public class Search_bar extends AppCompatActivity {
    private AutoCompleteTextView mSearchField;

    FirebaseDatabase database =
        FirebaseDatabase.getInstance("https://indoor-navigation-new-866e0-default-rtdb.firebaseio.com/");

    DatabaseReference ref = database.getReference("User");

    private ListView listView;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_search_bar);
        mSearchField = (AutoCompleteTextView) findViewById(R.id.search_field);
    }
}
```



```

listView = (ListView) findViewById(R.id.listView);

ValueEventListener event = new ValueEventListener() {
    @Override
    public void onDataChange(@NonNull DataSnapshot snapshot) {
        populateSearch(snapshot);
    }

    @Override
    public void onCancelled(@NonNull DatabaseError error) {
    }
};

ref.addListenerForSingleValueEvent(event);
}

private void populateSearch(DataSnapshot snapshot) {
    ArrayList<String> names = new ArrayList<>();

    if(snapshot.exists()){
        for(DataSnapshot ds : snapshot.getChildren()){
            String name = ds.child("name").getValue(String.class);
            names.add(name);
        }

        ArrayAdapter<String> adapter = new ArrayAdapter<String>(this,
            android.R.layout.simple_list_item_1,names);
        mSearchField.setAdapter(adapter);

        mSearchField.setOnItemClickListener(new AdapterView.OnItemClickListener() {
            @Override
            public void onItemClick(AdapterView<?> adapterView, View view, int i, long l) {
                String name = mSearchField.getText().toString();
                searchUser(name);
            }
        })
    }
}

```

```

    });
} else {
    Log.d("Users", "No data found");
}
}

private void searchUser(String name) {
    Query query = ref.orderByChild("name").equalTo(name);
    query.addListenerForSingleValueEvent(new ValueEventListener() {
        @Override
        public void onDataChange(@NonNull DataSnapshot snapshot) {
            if(snapshot.exists()){
                ArrayList<String> listuser = new ArrayList<>();
                for(DataSnapshot ds : snapshot.getChildren())
                {
                    Users user = new
                    Users(ds.child("name").getValue(String.class),ds.child("devicename").getValue(String
                    .class));

                    listuser.add(user.getName()+"\n"+user.getDeviceName());
                }

                ArrayAdapter<String> adapter1 = new ArrayAdapter<>(getApplicationContext(),
                android.R.layout.simple_list_item_1,listuser);
                listView.setAdapter(adapter1);
            } else {
                Log.d("Users", "No data found");
            }
        }
    });

    @Override
    public void onCancelled(@NonNull DatabaseError error) {

    }
}
});

```

```

    }

class Users {

    public String name, devicename;

    public Users(){

    }

    public String getName() {
        return name;
    }

    public String getDeviceName() {
        return devicename;
    }

    public void setName(String name) {
        name = name;
    }

    public void setDeviceName(String Devicename) {
        devicename = Devicename;
    }

    public Users(String Name, String Devicename) {
        name = Name;
        devicename = Devicename;
    }
}

```

## Activity\_search\_bar.xml

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:background="#ffffff"
    tools:context=".Search_bar">

    <TextView
        android:id="@+id/heading_label"
        android:layout_width="401dp"
        android:layout_height="wrap_content"
        android:layout_alignParentStart="true"
        android:layout_alignParentTop="true"
        android:layout_marginStart="10dp"
        android:layout_marginLeft="30dp"
        android:layout_marginTop="20dp"
        android:text="Who are you looking for?"
        android:textColor="#555555"
        android:textSize="24sp" />

    <AutoCompleteTextView
        android:id="@+id/search_field"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_below="@+id/heading_label"
        android:layout_alignStart="@+id/heading_label"
        android:layout_marginTop="20dp"
        android:layout_marginRight="20dp"
        android:layout_toStartOf="@+id/search_btn"
        android:background="@drawable/search_layout"
        android:ems="10"
```

```
    android:fontFamily="@font/nunito_semibold"
    android:hint="Search here"
    android:inputType="textPersonName"
    android:paddingLeft="20dp"
    android:paddingTop="10dp"
    android:paddingRight="20dp"
    android:paddingBottom="10dp"
    android:textColor="#999999"
    android:textSize="16sp" />
```

```
<ImageButton
```

```
    android:id="@+id/search_btn"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignTop="@+id/search_field"
    android:layout_alignBottom="@+id/search_field"
    android:layout_alignParentEnd="true"
    android:layout_marginRight="30dp"
    android:background="@android:color/background_light"
    app:srcCompat="@mipmap/search_button" />
```

```
<ListView
```

```
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:layout_below="@id/search_btn"
    android:padding="10dp"
    android:layout_marginBottom="10dp"
    android:id="@+id/listView"/>
```

```
</RelativeLayout>
```

## AndroidManifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    package="com.example.indoor_navigation_new">

    <uses-permission android:name="android.permission.BLUETOOTH_CONNECT" />
    <uses-permission android:name="android.permission.BLUETOOTH" />

    <uses-permission
        android:name="android.permission.BLUETOOTH_PRIVILEGED"
        tools:ignore="ProtectedPermissions" />
    <uses-permission android:name="android.permission.INTERNET" />
    <uses-permission
        android:name="android.permission.LOCAL_MAC_ADDRESS"
        tools:ignore="ProtectedPermissions" />

    <application
        android:allowBackup="true"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:roundIcon="@mipmap/ic_launcher_round"
        android:supportsRtl="true"
        android:theme="@style/Theme.Indoor_navigation_new">
        <activity
            android:name=".Search_bar"
            android:exported="true" />
        <activity
            android:name=".MainActivity"
            android:exported="true">
        </activity>

        <activity
            android:name=".HomeScreen"
```

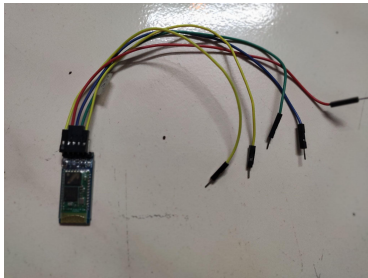
```
    android:exported="true">
    <intent-filter>
        <action android:name="android.intent.action.MAIN" />

        <category android:name="android.intent.category.LAUNCHER" />
    </intent-filter>
</activity>
</application>
</manifest>
```

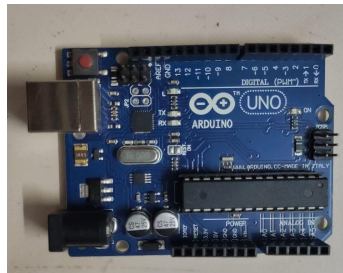
## Chapter 7

### Results and Discussions:

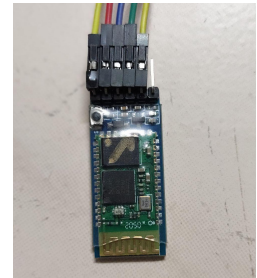
#### Hardware board



**Jumper Wires**

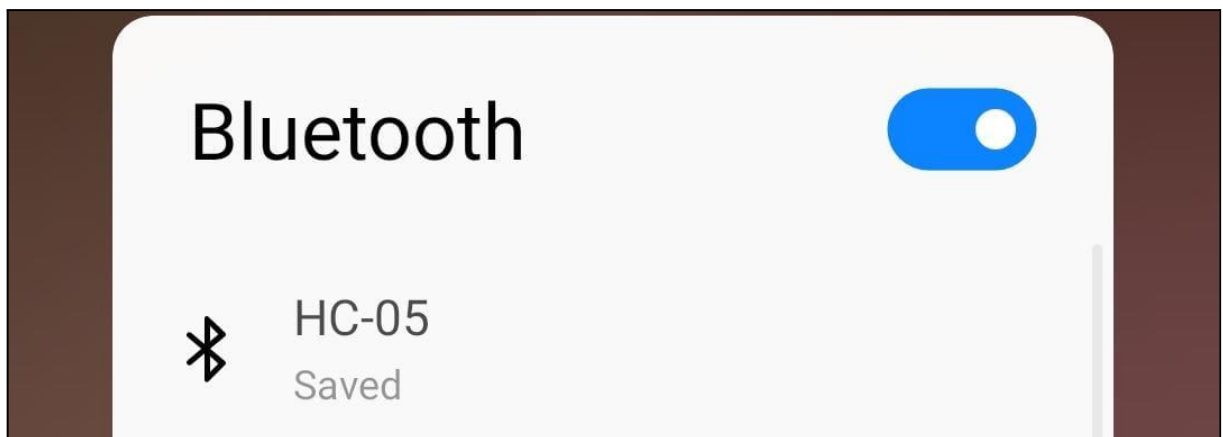


**Arduino Uno Board**



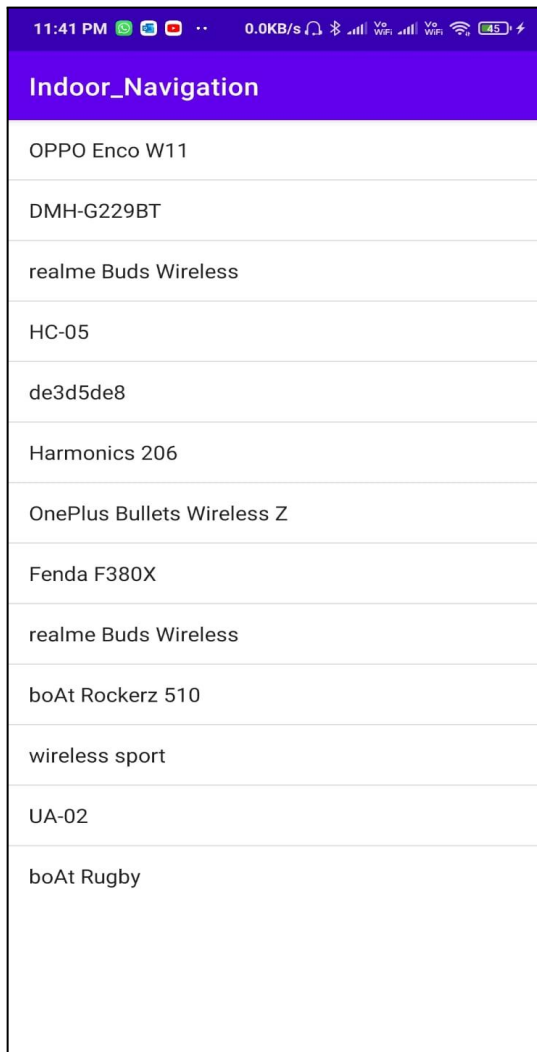
**Bluetooth Module HC-05**

#### Image and output on phone

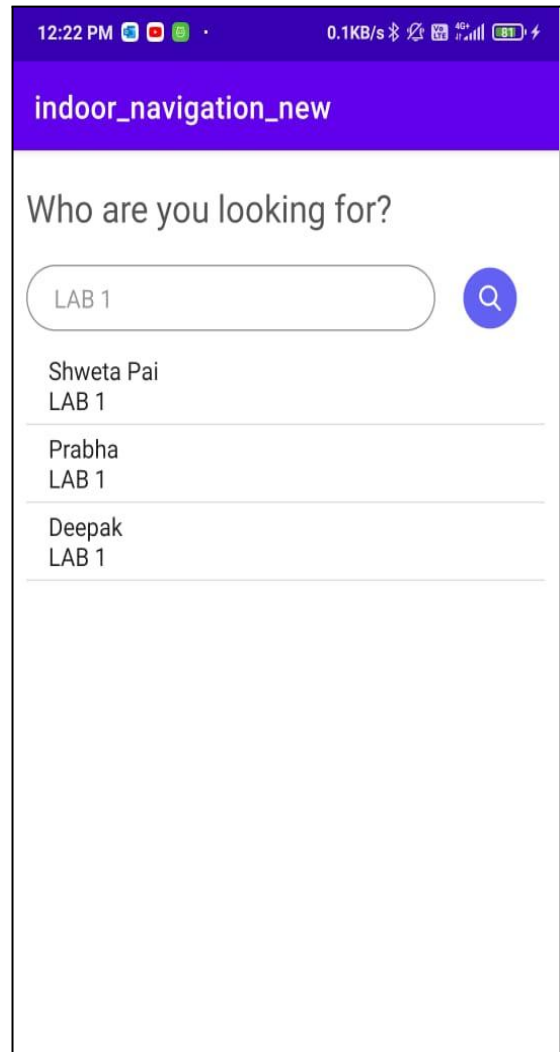


Bluetooth module HC-05 connected to mobile device.

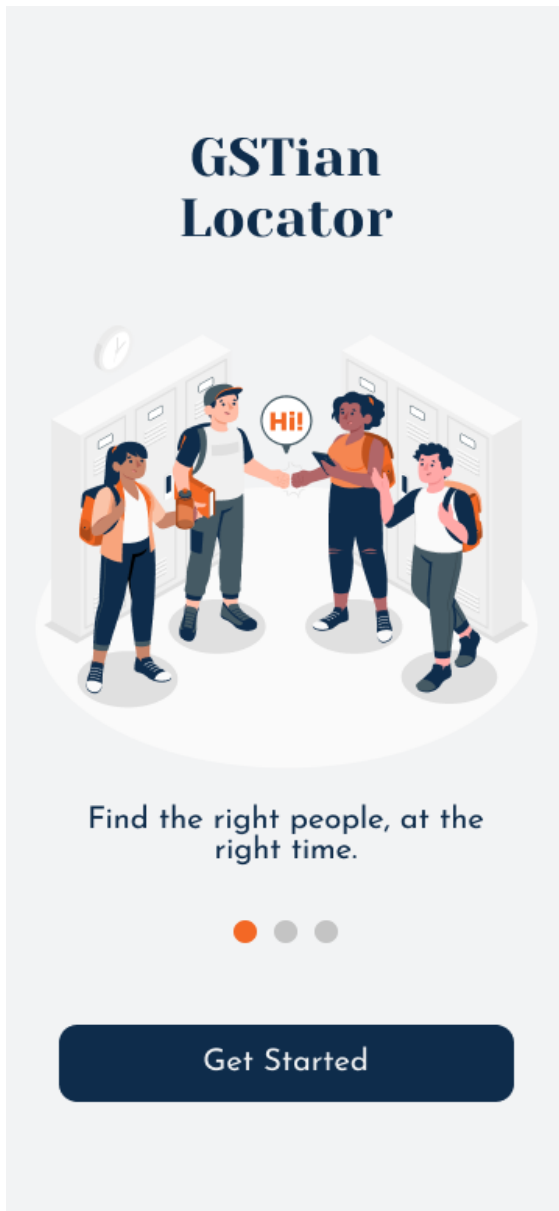




All paired devices



User search page



Sliding screen of the application

The image shows the login page of the GSTian Locator application. At the top, the title "GSTian Locator" is displayed in a bold, dark blue font. Below the title, the text "Login to your account" is shown in a bold, orange font. There are three input fields: "Name" with the placeholder "Enter your name here", "PRN" with the placeholder "Enter your mail id here", and "Password" with the placeholder "Enter your password here" and a toggle icon. Below the password field is a link that says "Forgot Password?". At the bottom of the page is a dark blue button with the text "Login" in white.


Login Page for the GSTian Locator

# GSTian Locator

## Login to your account

Name

PRN


Password  

[Forgot Password?](#)

Login

Login with credentials image

## GSTian Locator



Hello Shweta,  
who are you looking for today?

Name of person being found

Search

-----

Today, you were searched by:

1. Prof. Stuti Ahuja, 12:30
2. Arfah Upade, 03:13
3. Rohit Viramani, 03:34

Your current location:  
Lab 01, First floor

Search Bar for people and your info

GSTian Locator

⌵

Hello Shweta,

who are you looking for today?

Name of person being found

Arfah Upade

Search

-----

Today, you were searched by:

1. Prof. Stuti Ahuja, 12:30

2. Arfah Upade, 03:13

3. Rohit Viramani, 03:34

Your current location:

Lab 01, First floor

Finding for a specific person

GSTian Locator

⌵

✓

Arfah Upade's

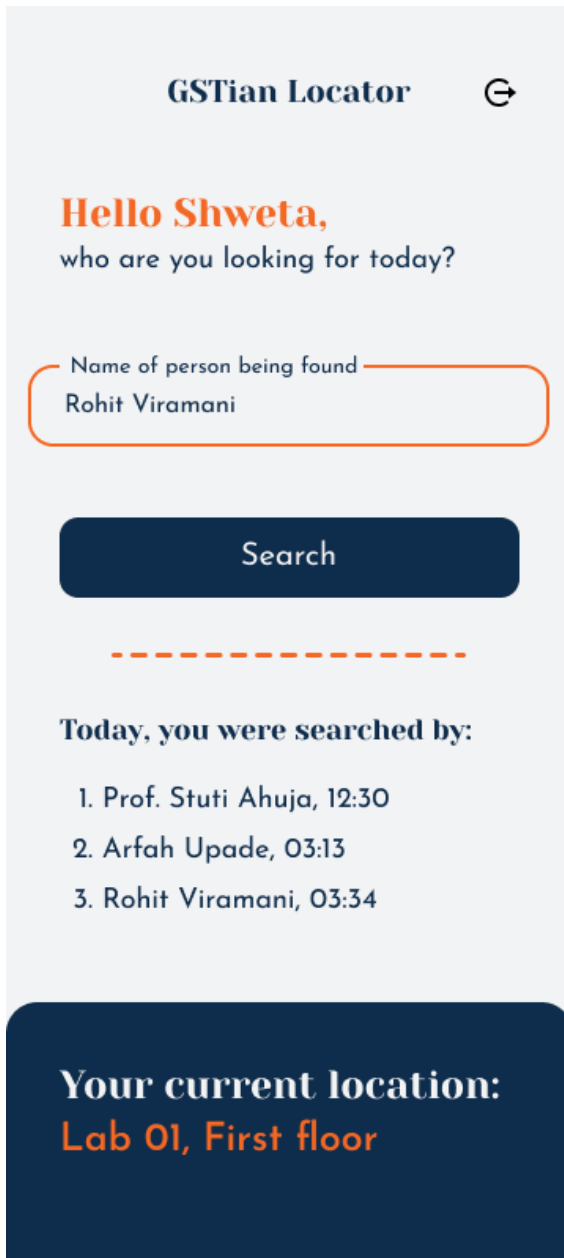
in the building!

Their current location:

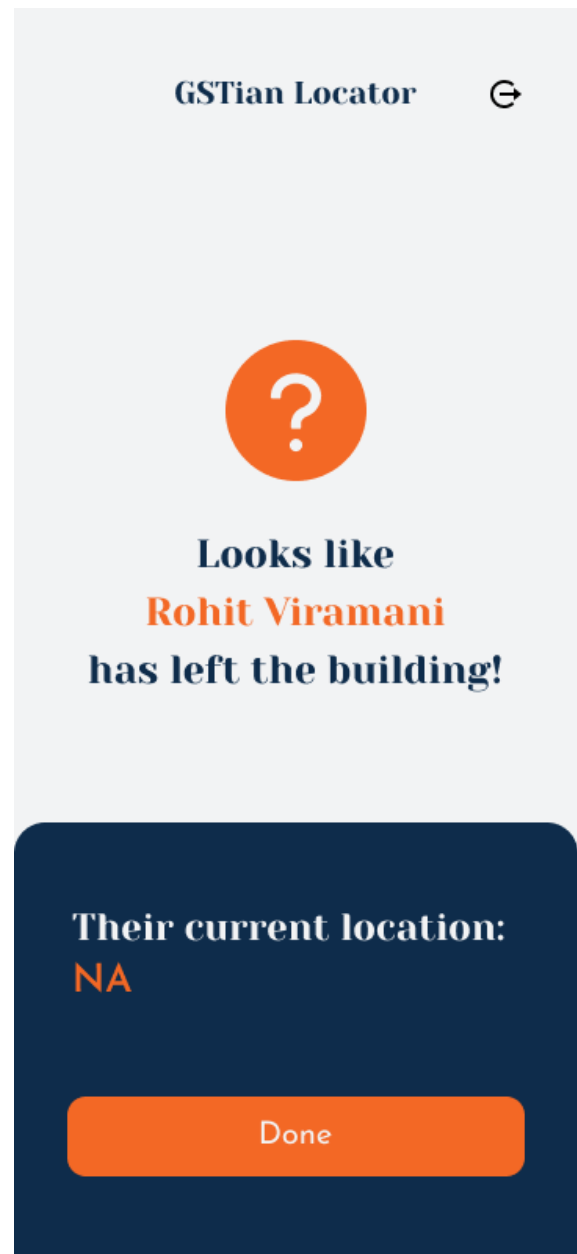
Lab 06, First floor

Done

Information related to the person



Finding for a specific person



Couldn't find the person in campus

## Chapter 8

### Conclusion

This report presents a detailed overview of the advancements in systems for indoor positioning and wayfinding. We classified the existing systems based on the adopted positioning technologies. Moreover, this work analyzed its advantages and limitations. It also discussed different assessment criteria for evaluating navigation and positioning systems. We further provided potential research directions for future research in indoor positioning and wayfinding systems.

### References

- [1] Chammi Graphics Studio, “How to connect HC-05 Bluetooth Module||Bluetooth module not recognized by mobile phone,” YouTube. Jun. 03, 2020. Accessed: Apr. 10, 2022. [YouTube Video]. Available: <https://www.youtube.com/watch?v=thptX9w0Oy0>
- [2] Tech, “Working on Bluetooth in Android and getting list of paired devices into listview,” YouTube. Jun. 09, 2018. Accessed: Apr. 10, 2022. [YouTube Video]. Available: <https://www.youtube.com/watch?v=3Xcn3llvSj8>
- [3] “Add Firebase to your Android project | Firebase Documentation,” Firebase, 2022. <https://firebase.google.com/docs/android/setup> (accessed Apr. 10, 2022).