

PROJECT REPORT

On

Android Bluetooth Chat

(CSE VI Semester Mini project)

2020-2021



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Session: 2020-2021

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CERTIFICATE

Certified that Mr. Vinod Singh Airy (Roll No.- 1018635) has developed mini project on “Android Bluetooth Chat” for the CS VI Semester Mini Project in Graphic Era Hill University, Dehradun. The project carried out by the student is his own work as best of my knowledge.

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ACKNOWLEDGMENT

We wish to thank our parents for their continuing support and encouragement. We also wish to thank them for providing us with the opportunity to reach this far in our studies.

We would like to thank particularly our project Co-ordinator Mr. Akash Chauhan and our Project Guide Mr. Avnish Panwar for his patience, support, and encouragement throughout the completion of this project and having faith in us.

At last but not the least We greatly indebted to all other persons who directly or indirectly helped us during this work.

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TABLE OF CONTENTS

CHAPTER NO.	TITLE	PAGE NO.
	LIST OF FIGURES	6
1.	INTRODUCTION	7
1.1	About Project	7
1.2	Bluetooth Technology	7
1.3	Literature Review	8
1.3.1	Android Architecture	8
1.3.2	Android Linux Kernel	9
1.4	Android Operating System	9
1.5	Bluetooth Connectivity in Android	10
2.	PROJECT	11
2.1	Requirement Analysis	11
2.1.1	Hardware requirements	11
2.1.2	Software requirements	11
2.3	E-R Diagram	12
2.4	Module	13
3.	SNAPSHOT OF PROJECT	14
3.1	Turing on Bluetooth and open app	14
3.2	List of paired and available devices	15

3.4	Select Device and device get connected	16
3.5	Connected Device and Chatting	
4.	CONCLUSION	17
4.1	FUTURE WORKS	17
	REFERENCE	18

LIST OF FIGURES

FIGURE	Page No.
1.1 E-R diagram of system	12

CHAPTER 1

INTRODUCTION

1.1 ABOUT PROJECT

The Android Bluetooth Chat messenger application is the two-way, sending and receiving, text chat program for phones. These devices are largely used in open and closed spaces and everywhere as street, squares, hotel and other places. the Bluetooth Chat messenger does not require a GMS or Wi-Fi connection, all it need is two Bluetooth Android devices in range of about 50 feet of each other.

1.2 Bluetooth technology:

Bluetooth is a technology designed by Ericsson in 1994 to wirelessly connect devices. It is used to exchange data among devices within short range, usually 10 metres. Bluetooth operates in the frequency range 2400 MHz to 2483.5 MHz which is the ISM unlicensed band. Bluetooth uses the concept of frequency hopping to avoid collisions. It usually performs 1500 hops per second.

There are several applications of Bluetooth out of which few are mentioned below:

- a) Connecting two nearby computers for data exchange.
- b) Wireless communication with tablets and speakers such as iOS and Android devices.
- c) Sending small advertisements from Bluetooth-enabled advertising hoardings to other, discoverable, Bluetooth devices.
- d) Transfer of files, contacts and other information.
- e) Wireless control of and communication between a mobile phone and a handsfree headset.

Some of the limitations of Bluetooth technology are mentioned below:

Some of the limitations of Bluetooth technology are mentioned below:

- a) As compared to Wi-Fi, which transfer data at 54 Mbps, Bluetooth is comparatively slower and its transfer rate is about 3 Mbps.
- b) Distance Limitations: For a Bluetooth hardware device installed in our computers or mobile devices, the range is up to 30 feet which sometimes be too short.
- c) Interference: Since Bluetooth operates in the unlicensed frequency spectrum, interference among Bluetooth signals is possible

1.3 Literature Review

Literature Review The Android project which is owned by Google was first unveiled to the world from New York City by T-Mobile, a leading mobile phone communication network in the United States of America, and HTC, a leading mobile phone manufacturer; as an operating system for the T-Mobile G1 phone. The first Android powered smart handset mobile phone appeared on the 23rd of September 2008 . Since 22nd of October 2008; when the T-Mobile G1 phone was first released for sale in the United States of America; the Android is rising in its market share and distribution as an operating system for various and many devices types including mobile phones, tablets among others. Android is growing 30 times faster than the US population [5]. The Bluetooth technology is a wide spread technology since it was first invented by Ericson's, which was a leading mobile phone manufacturer now named Sony Ericson– Dutch-born, senior scientist Jaap Haartsen and air interface expert Sven Mattis back at 1994. In March 2001 Bluetooth was first introduced [6]. Nowadays it is difficult to find a device with no Bluetooth transceiver

1.3.1 The Android's Architecture

The Android operating system is an open source and free platform; it is not bound to one hardware provider or manufacturer. This openness of Android is allowing a quick gain of the market share; but this would be covered later in market analysis. Android also can run on many devices with various screen resolutions and sizes. For an Android device to be certified as compatible; it have to follow certain hardware rules including but not limited to: a compass, a Global Positioning System (GPS) trait, a camera and a Bluetooth transceiver which is needed for the Blue Chat application.

1.3.2 Android Linux Kernel

The Linux kernel is basically used in core system services as memory management, network stack, security, process management, and driver model. The kernel works as an abstraction layer between the hardware of an android device and the remainder of the software stack. Android was made on top of the open-source Linux 2.6 kernel. The developing team chose this kernel because it delivered confirmed core features to develop the Android operating system on which includes: 4 M.S.A. El-Seoud and I.A.T.F. Taj-Eddin

1. Process management: as the kernel allocates resources to processes as they need managing processes well.
2. Memory management: where the kernel handles memory management by itself.
3. Network stack: the kernel handles network communication.
4. Driver model: ensuring that anything or everything works and enabling hardware manufacturers to build their drivers into the Linux build.
5. Security model: where the kernel handles security among the system and the applications.

1.4 Android Operating System:

Android is a mobile operating system developed by Google. It is based on Linux kernel. Android is primarily designed for mobile devices such as smartphones, tablets, Android televisions, wrist watches. All the above mentioned devices are touchscreen devices. Android uses touch inputs like swiping, tapping, pinching and reverse pinching on objects visible on screen along with a virtual keyboard. It could be also used in game consoles and other electronics.

The list of features in Android Operating system are mentioned below: a) Messaging: SMS and MMS are the means of exchanging messages. Android Google Cloud Messaging(GCM) is also a part of Android Push Messaging service.

b) Screen Capture: Android supports capturing a screenshot by pressing the power and volume-down buttons at the same time.

c) Connectivity: Android supports connectivity technologies including GSM/EDGE, Wi-Fi, Bluetooth, LTE, CDMA, EV-DO, UMTS, NFC, IDEN and WiMAX.

1.5 Bluetooth Connectivity in Android:

The Android platform supports Bluetooth data transfer. Exchange of data is done using the inbuilt Bluetooth network stack. This stack allows two or more Bluetooth enabled devices to wirelessly exchange messages with each other. Bluetooth APIs are present for the users in order to access the Bluetooth network stack. The APIs help establish one to one connection or one to many connection wirelessly without having to know about the hardware details.

Using the Bluetooth API's an android application can do the following tasks:

- a) Scan for other Bluetooth devices in the vicinity.
- B) Query the local Bluetooth adapter for paired Bluetooth devices.
- c) Establish RFCOMM channels with other Bluetooth enabled devices.
- d) Connect to other Bluetooth devices through service discovery protocol.
- e) Transfer data to and from other devices.

CHAPTER 2

PROJECT

2.1 REQUIREMENT ANALYSIS

2.1.1 Hardware Requirements:

HP pavilion. The specification of the system is given as Intel(R)Core(TM) i5-1035G1 CPU @ 1.50GHz 1.19 GHz/8 GEN/8GBRAM/1TBHD/INTEGRATED GRAPHICS/15" FHD AG SCREEN

2.1.2 Software Requirement

- Windows 10 Home Single Language, Version: - 2004, OS Build: - 19041.572
- Android Studio is used for developing this application.

2.2 E-R Diagram

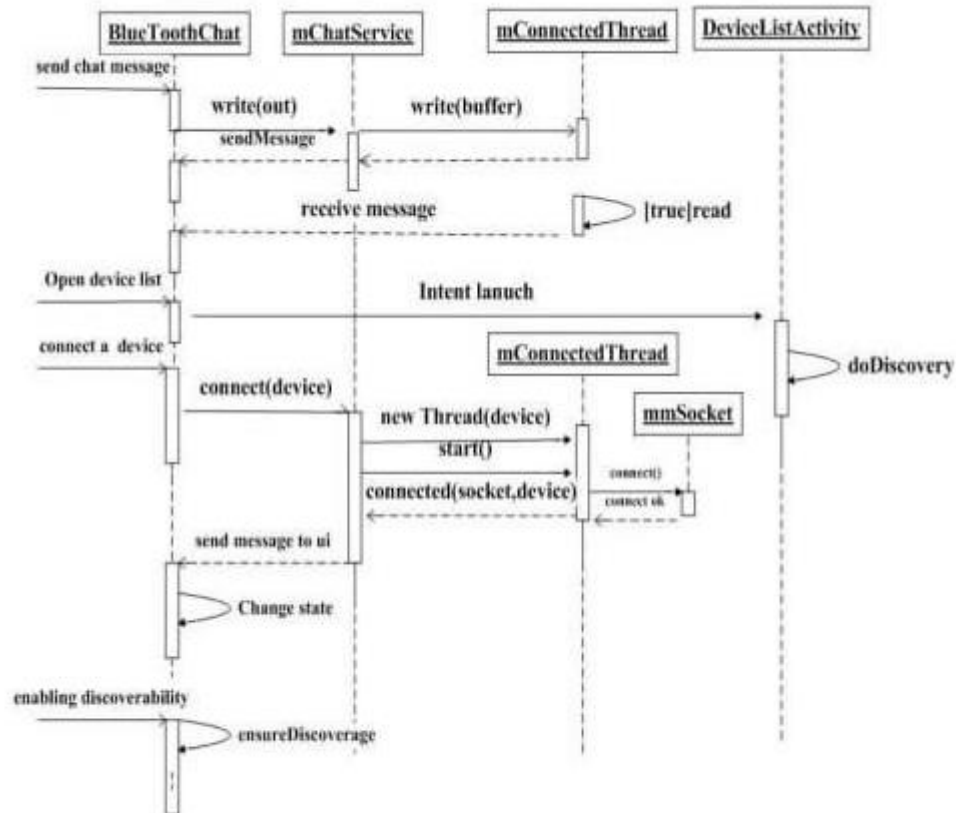
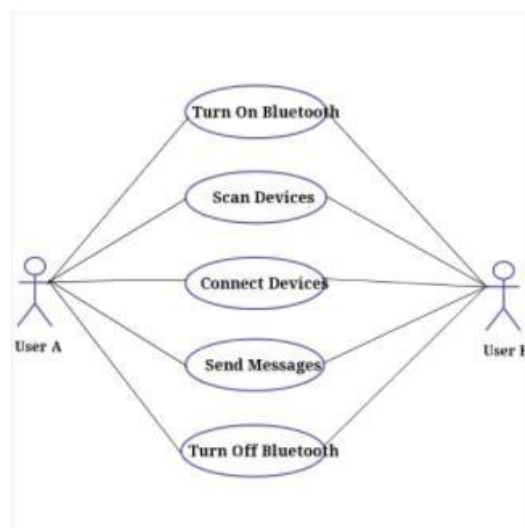


Figure 2. The system as call sequence diagram



USER CASE DIAGRAM

2.3 MODULES:

- **Scanning for other Bluetooth Devices:**

This application begins searching for a device as soon as it opened. It scan all paired and available devices and user can select a name of other Bluetooth device with which he wants to connect and send or receive data.

- **Querying the local Bluetooth adapter for the paired devices:**

The Bluetooth Adapter is the entry-point for all Bluetooth interactions. Using this you can discover other Bluetooth Devices using a known Mac address , and create a Bluetooth Server Socket to listen for communication from other devices. This is the connection point that allow an application to exchange data with another Bluetooth device via InputStream and OutputStream.

- **Connecting data over Bluetooth:**

You must request the Bluetooth permission in order to perform any Bluetooth communications, such as requesting a connection, accepting a connection, and transferring data. Before your application can communicate over Bluetooth, you need to verify that Bluetooth is supported on the device and if so, ensure that it is enabled. Once a connection is made with a remote device for the first time, a pairing request is automatically presented to the user. When a device is paired, the basic information about that device is saved.

- **Transferring data over Bluetooth:**

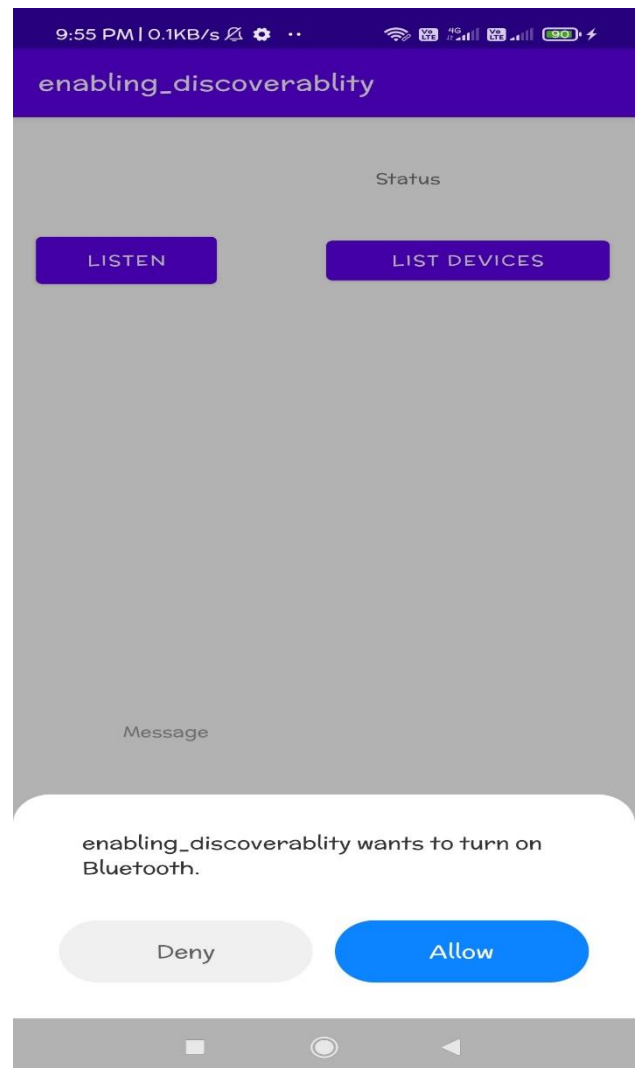
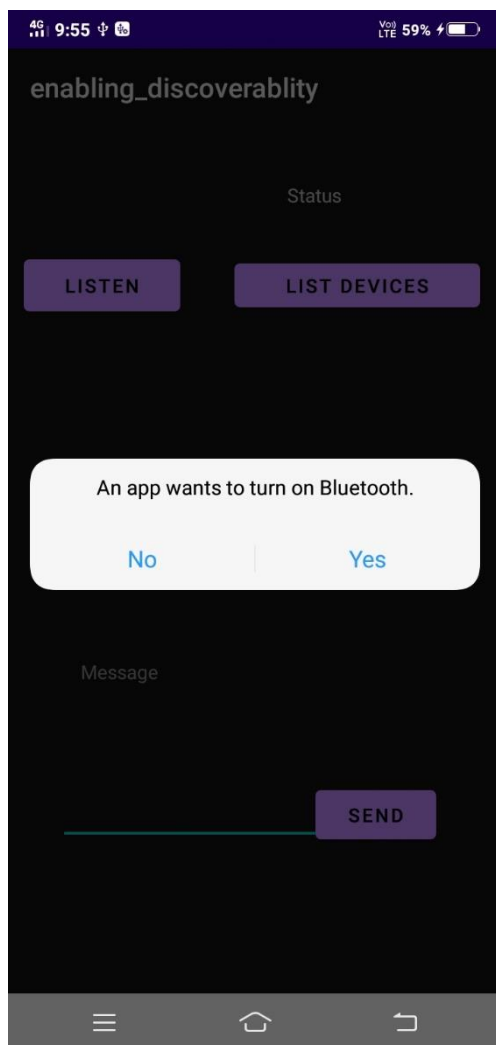
Once you have connected with the device successfully you can send the data and important information over the Bluetooth using this application.

If other user press back from chat window then the toast come to your screen that connection was lost and if other user close that app the message come to you that Device is not available anymore.

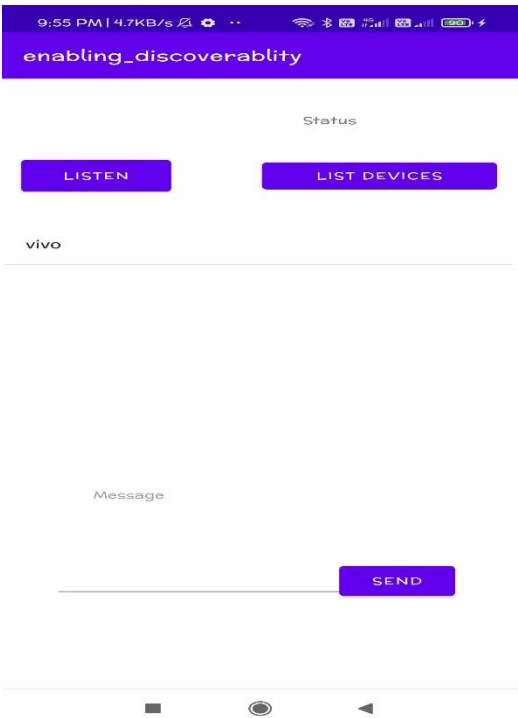
CHAPTER 3

SNAPSHOT OF PROJECT

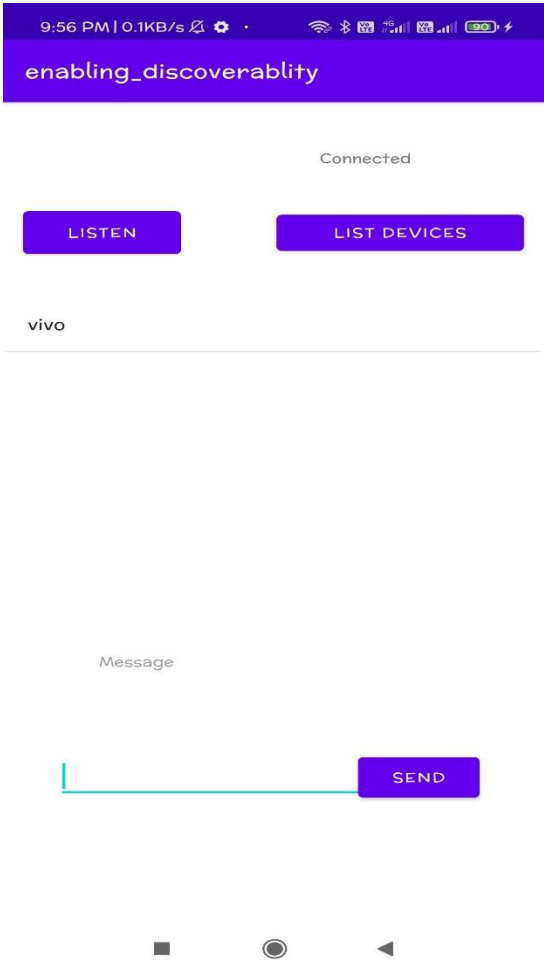
3.1 Turing on Bluetooth and open app



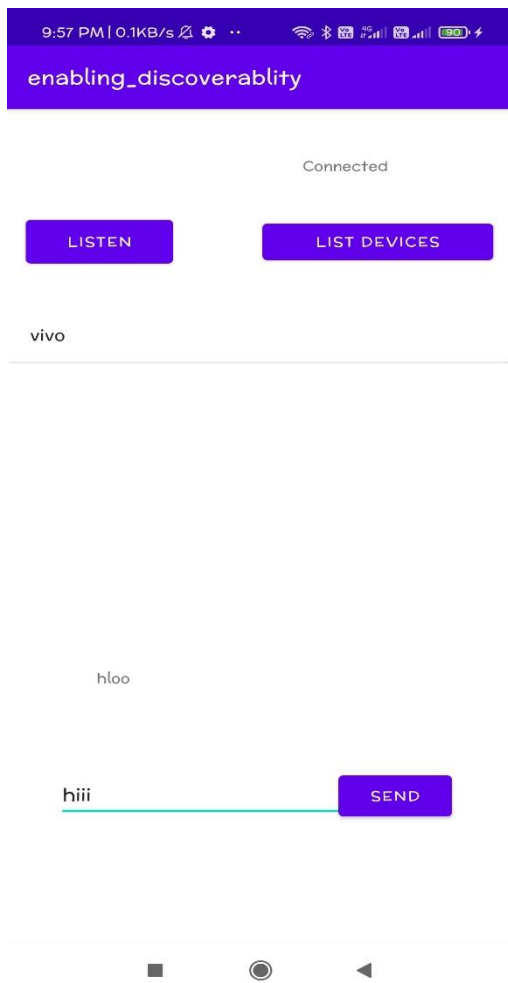
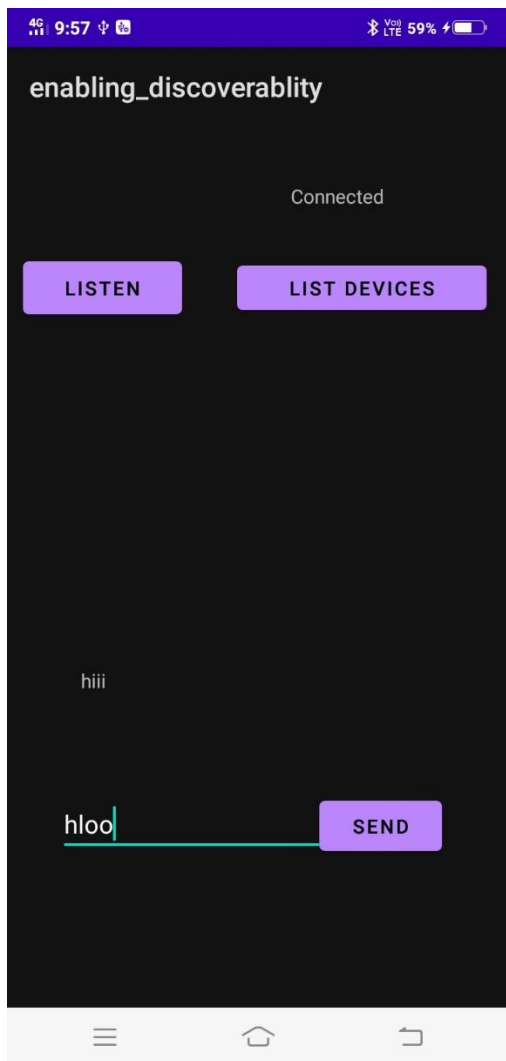
3.2 List of paired and available devices



1. 3.3 Choose device and device get connected



3.4 Connected device and chatting:



CHAPTER 4

CONCLUSION

4.1 CONCLUSION & FUTURE SCOPE

The messenger application using Bluetooth technology was successfully completed in Windows platform and in Android platform.

- a) Bluetooth consumes low power as compared to Wi-fi technology and on the other hand Wi-fi has a range of almost ten times to that of Bluetooth. In order to account for the limitations in range, we can incorporate Wi-fi communication in our application.

The goal of this is to create an Android application Blue Chat. This application would take the advantage of the wide spread of the Android operating system via varieties of devices. It is concerned with solving some problems of communicating freely, securely, silently and within small range. It is great for making new friends in a library or chatting up someone in crowded places. The application paves the ground for more Bluetooth applications.

References

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- Gavalas, D., & Economou, D. (2021). Development platforms for mobile applications: Status and trends. *Software, IEEE*, 28(1), 77-86.