



Remote Trackpad : Android Controlled - Computer Mouse Pointer using Bluetooth

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Abstract: The wireless touchpad remote basically aims to work as a multipurpose input device for a computer. It can perform all the functions that a wired mouse can, but without any cords or wires. In addition it is possible to run in presentation remote control mode. Everything you need is a blue tooth module in both devices. Currently only Windows powered mobile devices and Windows host computers are supported. It's an application for phones and tablets running on Google's Android operating system. It can be operated from anywhere within the certain boundaries.

Keywords: Bluetooth connectivity, Remote Touchpad, Android 2.3.

I. INTRODUCTION

In this 21st century, the need for many android based applications has gradually increased. The main motto of our project is to make ones work easy by implementing a touch pad application. A Trackpad or Touchpad is a pointing device featuring a tactile sensor, a specialized surface that can translate the motion and position of a user's fingers to a relative position on screen. Remote Trackpad turns your smart phone into a wireless user-friendly remote control for your PC. It'll surprise you with fully simulated touchpad, mouse and featured remote panels which make your remote experience simple and efficient. You can sit a bit faraway to the laptop but in the perimeter of Bluetooth and can access all the other applications that a mouse can, from your android application. The tool used for the development of project is Eclipse. "Xml" is used for interface (front end) and "java" is used for implementing the backend process.

With the new system the following activities are associated with following features:

- It Provides easily interact able interface.
- As we are using Bluetooth as a connectivity medium, there is no need of entering port numbers for establishment of the connection.

Server.jar (system side) file is executed in order to get the client request and using client.apk (smart phone side) client can interact with server.

For the flexibility of the user, the interface has been developed in graphical user interface mode. The GUI's at the top level has been categorized as: **Client User Interface**. The **Client User Interface** resembles an actual real time touchpad. It also provides features for scanning, pairing and discovering. The system after careful analysis has been identified to present with the 2 modules. The input module takes the coordinates associated with the user movement.

The output module creates the movement in the cursor on the desktop.

It is basically an android application. **Android** is an operating system based on the Linux kernel, and designed primarily for touch screen mobile devices such as smart phones and tablet computers. In theory the application will be able to run by other devices that can emulate the Android, but this will not be a consideration during design. The android mobile platform constitutes of an operating system (OS), the middle ware, main applications, and a (SDK). The SDK facilitates the developers with the APIs and tools needed for development[1]. Android has become a need rather than luxury these days, and its popularity has increased rapidly among the smart phones.

Some of the major benefits of using android OS in mobile phones and smart phones are as follows:

- Android is based on Linux. This facilitates easy accessibility to rich development environment and core functionality of the mobile device.
- It allows quick information gathering. It also provides the accurate information sought.
- The development tools are easy to use.
- All the information and services are provided to the developers without any biasness.
- It provides rich browser facilities as well. This facilitates the developer to provide enhanced services.

II. SYSTEM DESIGN

The system depicted below provides wireless connectivity via Bluetooth. It connects your Smart phone and your PC or laptop and provides flexibility to use as a mouse cursor controller.



Figure: 1

III. SYSTEM IMPLEMENTATION

The modules involved in the system design are communication between laptop and smart phone, smart phone (client) side computing, laptop (server) side computing.

A. Establishment of connection between Smart phone and Computer:

A Smart phone basically uses two types of connectivity one wi-fi and other one Bluetooth. In this implementation of trackpad the connection is established using Bluetooth. It requires Bluetooth adapter for initializing the Bluetooth connection[2].

```
private final BluetoothAdapter mAdapterer;
Bluetooth also uses unique UUID for this application:
private static final UUID MY_UUID =
UUID.fromString("04c6093b-0000-1000-8000-00805f9b34fb");
```

There are few states for bluetooth:

- STATE_NONE
- STATE_LISTEN
- STATE_CONNECTING
- STATE_CONNECTED

This is how bluetooth connection is established.

B. Client side implementation (Smart phone):

The whole smart phone screen serves as the virtual touchpad of the computer. User uses his/her finger to move cursor on the screen. When user moves his finger on the interface of the smart phone, it invokes a method called onTouchEvent() which generates the coordinates required, which are transmitted to the Server side. This method generates coordinates continuously according to the movement of the finger.

```
public boolean onTouchEvent(MotionEvent evt)
{
String coords = Math.round(evt.getX()) + ", " +
Math.round(evt.getY())+", ";
byte[] bytes=coords.getBytes();
mCommandService.write(bytes);
return true;
}
```

The coordinates will be transmitted only through Byte buffer. mCommandService.write(bytes) collects the coordinates and sends it to the Bluetooth module for transmitting them to the Computer.

C. Server side implementation (Computer):

We need to run server on the computer side. The purpose of the server is to create a thread and wait for connection. When a request for connection occurs it starts the process. The Server is also provided with the same UUID as specified in the Client side. The server now receives the

input from the client created by the finger movement. The input is received using[3]:

```
InputStream inputStream=
mConnection.getInputStream();
```

The transmission of coordinates is processed using byte buffer so this bytearray must be converted into string.

```
InputStream.read (buffer);
st = byteArrayToString(buffer);
```

Now, this string is converted into integer and the calculations for resolution are performed. The resulted integers (coordinates) are provided as parameters for mouseMove(x, y) method. This method is invoked by the object of Robot class[4].

```
xx=Integer.parseInt(x);
yy=Integer.parseInt(y);
xx = 1080 * xx / 300;
yy = 720 * yy / 700;
Robot r = new Robot();
r.mouseMove(xx, yy);
```

This moves the cursor on the computer screen.

D. Snapshots of the Remote Touchpad:

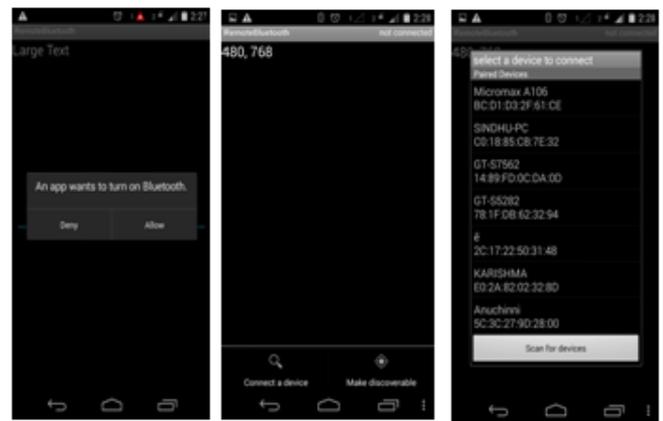


Figure: 2

E. Application:

- Presentations
- Meetings and Conferences
- E-Classrooms
- Remote controlling etc.

IV. CONCLUSION

Through the proposed project, the mechanism of controlling any computer device's touch pad through an android app has been realized. The basic functionalities like the ability to controlling mouse cursor through this project's implementation have been deployed. As an extension to this, functionalities like simulation of right, left mouse buttons, scrolling are already under process.

V. REFERENCES

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- [4]. www.w3schools.com