Controlling PC/Laptop via Android Phone
(Android Remote Control)

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Abstract

This paper represents how your PC and Laptop can be controlled from remote place with smartphone using internet. It basically turns your smartphone into wireless keyboard and mouse with touchpad. This application can be performed with some wireless connection between the PC or Laptop and the smartphone with Android operating system. By accessing the IP address of PC, we can establish a connection between them using Wi-Fi connection. This application not only turns your smartphone into wireless keyboard and mouse but it also provides various other features including voice to text conversion. The implemented application consists of two parts, the first one is an application for Android smartphone and the second one is a server application that executes the command selected by user's application. The outcome of this implementation is a handy, easy-to-use application.

1. Introduction

Nowadays, PC's, Laptop's and all other electronic gadgets are inseparable part of our everyday life. Personal computers are not any longer meant for working purpose, but more and more used for entertainment in people's spare time. This is also applicable to the mobile phones, which have transformed into multifunctional devices with almost same features as computer's have. Smartphone's are common and commercially used device all over the world, user-friendly interface and lots of features such as Wi-Fi, Internet access, Bluetooth, Camera, Video recording etc. add-on to the Android smartphone to be popular all over the world with cheap cost. We propose application which is compatible and useful in both the areas, the aim is to utilize provided hardware features from smartphone devices along with various useful libraries from Android API. As a result, an application combining different pointing devices is created. The connection of a smartphone with the Laptop is established wirelessly via Wi-Fi, for desktop an external modem is used to have a Wi-Fi connection.

One of the most widely used mobile OS these days is **Android**. Android comprise not only operating system but also middleware and key applications. Android Inc was founded by Andy Rubin, Rich Miner, Nick Sears and Chris White at Palo Alto of California, U.S. in2003.Later Android Inc was acquired by Google in2005. After original release there have been number of updates in original version of Android.

1.1. Objectives

2. Touch-screen mouse control with two onscreen mouse buttons.

3. Use in either portrait or landscape mode.

4. Works with any Wi-Fi network

5. Keyboard typing capability.

6. Operating computer functionality and handling and modification capability.

7. Support any Android operating system version.

8. Compatible with Mac, Windows and Linux operating systems.

9. Voice typing mechanism, on voice commands all the typing is done in desktop/laptop.

10. It can be used for showing live coding demo.

2. Literature Review

There are a large number of implementations to the solution applied to Android software stack. It has an open protocol and it is widely deployed in the open source community. This solution adapts very well to provide part of the functionality of the architecture, and it will be studied further.

Lingyan Bi et al.[1] proposed a novel method to Design a Android based Remote Control System e with JNI Interface for providing convenience for the user. Michael Spreitzenbarth et al.[2] proposed analysis based Smartphone Mobile Malware for forensic Analyses. Xinfang Lee, et al.[3] presented a novel Android based Forensic System. Enck, W et al.[4] proposed a secure Android Remote controlling mechanism for performing secure transaction form the Remote location. T. Richardson et al.[5] proposed a novel method of Internet based Android application to demonstrate working of Internet Computing.

The growing popularity and spread of smart phones has changed the design of computer systems as they were known in recent years. Technological developments have enabled the creation of mobile devices with technical features previously only conceived in PC architectures or similar devices. With this evolution comes the need to integrate these devices with others so they can take actions and monitor interaction on mobile devices .Other aspect to be considered is the remote visualization mechanisms that are useful for achieve a remote display of the devices. The most popular system designed to perform remote control of devices is Virtual Networking Computing.

3. Implementation

Proposed system can be modelled in two parts Server side application (Desktops/Laptops) developed using Java programming language and Client side application (Android phone) which is to be developed in android sdk. To establish connection between both the devices wirelessly Wi-Fi connection technology is used, in which information and commands are transfer in the form of packets, connection is established using IP address of Desktop/Laptops network interface card (NIC). In desktops external modem is connected at USB slot to have Wireless support for Wi-Fi connection as shown in Figure-1.

In Laptops, Wi-Fi NIC is already configured, so there is no need to connect Wi-Fi externally as shown in Figure-2. As shown in the above figures, Android phone and Laptop/PC is interacting with each other via Wi-Fi, the flow of information is exchanged between both the devices, in which actions and commands are translated on both the side and information is transferred in the form of bundles (Packets). Client and server communication is possible due to Wi-Fi. In android certain Activity is created for performing specific operation, to achieve functionality several threads are created which are executed for performing some tasks in android application.

Mobile client application is required to install on Android phone. It supports most operation while making a PowerPoint presentation or playing media, such as play, pause, rewind, volume controls, and controlling Mouse and Keyboard activity of Server computer etc. You could even use the file browser to open the PowerPoint for presentation. It also requires a server application on PC.
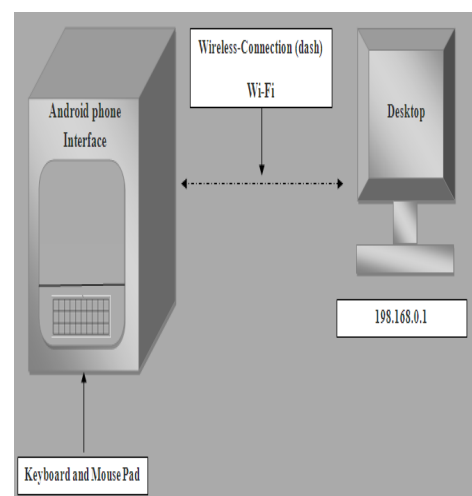

Figure-1.System architecture for desktop's

It will automatically search for a server (if not, tap up the Menu option and Select Find Server), then enter the IP address to connect your Android phone to your computer or Laptop or Desktop. The devices must be connected to the same Wireless network. Once the devices are connected, you can open the file browser from your Android phone and start controlling from mobile. For more controls, you need to bring up the

virtual keyboard by tapping on the keyboard icon. Pushing a button on a remote control sets in motion a series of events that causes the controlled device to carry out a command. The process works something like this:

Touch pad interface is created on the Android platform through which all the controlling operation of PC is performed and Left and Right click button is also created in the interface of Android to control the Mouse Right and Left click operation, also a Keyboard button is created after clicking on that button Keyboard

Android Application
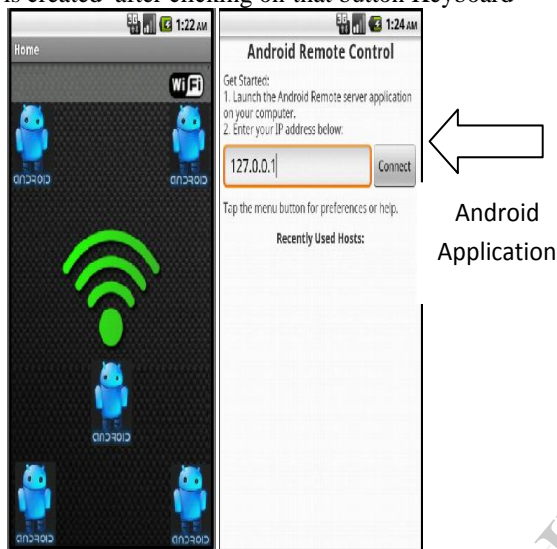
Interface is visualized on the android interface. In the Keyboard any key can be press and according to Key Event action are performed at the Server side and after giving Key event the specific key value is converted to ASCII value that will be transferred in the form of Bundle of information called Packet wirlessly and at the Server side it is converted into Byte Array using Java Wrapper Classes to read specific command which comes from the Android Interface and Specific text is printed on the screen.

Mouse Action event is based on the gesture specification, for which touch interface is created and gesture of fingerprint computation is performed. Angle of Orientation, Intensity, Bifirgation and Start and Termination points are all the paramter values which are needed to perform specific operation. As per gesture parmeter, action is performed on the Server side, Mouse Event is created and in Android Application certain Activity's and Thread's are initialized to perform specific operation on the Server Side, command and Event information is transferred wirelessly from Client to Server. At Server Side certain Packages and Interfaces are used such as InetAddress , Robot class, AWT etc to achieve and support certain

functionality. IP address can be fetched using getlocalhost() method which is necessary to established a connection and Robot Class is used for recording Motion Co-ordinates, Gestures and Co-ordinate location of individual pixels and also it is necessary for Mapping the Windows and Android device co-ordinate.

4. Features

1. Handling Media center in Laptops operating System

Play song, stop, Rewind, Forward, next previous all these operations handle by android phone.

Android Phone Play, Stop Media Center
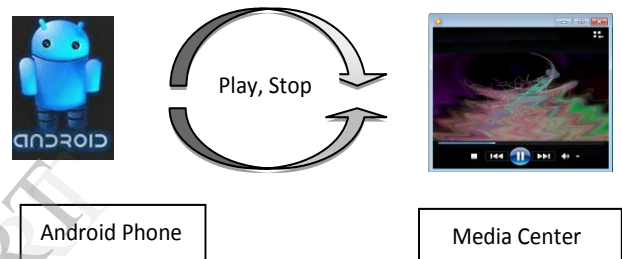
2. Handling Presentation of Slide in Laptops operating System

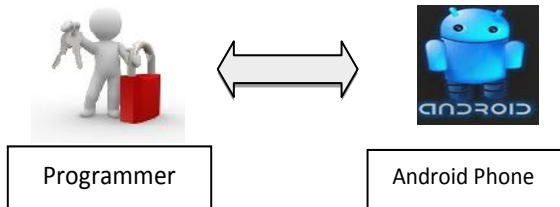Next, previous, Stop, Play all these operations handle by android phone

Android Phone Laptop

3. No use of Wired Mouse and Keyboard Handle all operation of keyboard and Mouse by android phone
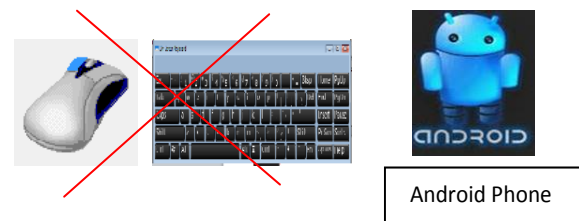
Android Phone

4. Professional Live Coding demo

Live coding Demo by android phone

Programmer ⟷ Android Phone

5. Conclusion and Future Scope

5.1 Conclusion

Our proposed work provides convenience to desktops/laptops users and save money of customers and provides best cost effective solution to their problems and key highlight is to have multitasking ability and it will also threaten the most of peripheral developer industries.

5.2 Future Scope

Our group will be creating a Remote Access application for Android phones. This application will run on a mobile platform (Android). Which provides services for data transfer, file transfer and it has ability to view the remote location on android phones.For wireless connection Bluetooth as well as Wi-Fi are embedded to it.

6. References

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[4]Enck, W., Ongtang, M., McDaniel, P., "Understanding Android Security", Security & Privacy, IEEE, Jan.-Feb. 2009, Volume 7, Issue 1, pp.50-57

[5]T. Richardson, Q. Staford-Fraser, K. Wood and A. Hooper, \Virtual networking computing", Internet Computing, Vol. 2, No. 1, pp.33-38, 1998.