

PC Game Controlling through Android Mobile using WiFi Network

Shreevallabh Kulkarni¹, Sandeep Navate², Akshay Kumavat³, Ravi Lokhande⁴
^{1,2,3,4}Sinhgad College of Engineering, Pune, INDIA

ABSTRACT

Every year scientists and video game enthusiasts are coming up with new techniques to make game playing experience better. In this paper, we will enlist the process to control PC games through android mobile using Wi-Fi Network. The intended system will enable single or multiple users to play games on single computer with the help of multiple android devices. A server application will be installed on user's computer which will act as controller between the game and the player's mobile device. The same application will also manage traffic coming from various devices enabling multiple players to play on single computer system. Client application should be installed on every android device which wants to connect to server. These client applications will work independent of each other but will be monitored by single server application. This system will eliminate the need of physical hardware Game-Controller, reducing cost of such Gaming consoles on a large extent and being wireless will grant ability to operate this device from a distance.

Keywords— Android; Game Controller; Java; Remote Control; Video Games

I. INTRODUCTION

From ancient times Entertainment has been undetectable part of Human Life. One cannot deny the fact that playing video games with your friends after extensive work in office works like energy refresher and soothes our mind. Now a days games can be played on Personal Computers or on dedicated machines called as Consoles. Both technologies have their plus points and negative ones, with nearly equal number of user base. In developing countries, however, gamers prefer Personal Computers over Gaming Consoles. In this paper, we will enlist a method to dilute the cons of these technologies and to come up with a result which will enhance the user's gameplay experience.

II. CURRENT GAMING TECHNOLOGIES

A. Video Game Console

A Video Game Console is a device that outputs a video signal or visual image to display a video game. The term "Video Game Console" is used to distinguish a console machine primarily designed for consumers to use for playing video games in contrast to arcade machines or home computers [1]. Consoles need to be connected to external compatible output device such as monitor or TV. These consoles come with a single or pair of input devices called as controllers.

B. Personal Computers

Personal Computers, being a general purpose computational device provide immense advantage to be used as gaming device because it can perform most of the functions a gaming console can perform without any special hardware. The common controllers of a Personal Computer are Keyboard and Mouse. Despite the fact that a PC can be an ideal gaming machine, it fails to provide a perfect gaming experience user is expecting. Where as in case of Gaming consoles, such experience is provided through Game Controllers.

III. RELATED WORK

There are some initiatives and projects designed to allow controlling of Personal Computers remotely. However most of the architectures have objective of handling Computer from a remote place [2]. Some projects use VNC (Virtual Network Computing) system to enable screen sharing between devices [3]. Such architectures give emphasis on handling functions like Graphical User Interface, File System. Having a system with dedicated architecture to control application would be crucial for a system to control PC games effectively through android mobile.

IV. ARCHITECTURE

The system contains 2 main components; one is PC (server) while other is Android Mobile (client).

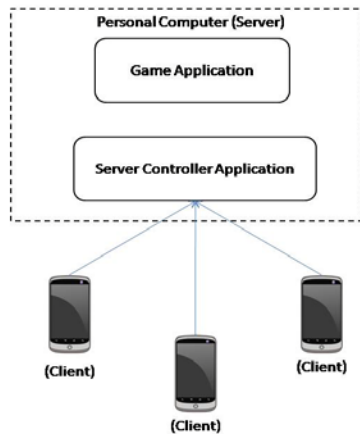


Figure 1: Overview of system architecture

The architecture states how the overall communication is done in the system. The client communicates to server application and server application processes data and redirects it to Game application. Here the game application is the application chosen by user. An insight in architecture can make process of understanding system working trivial.

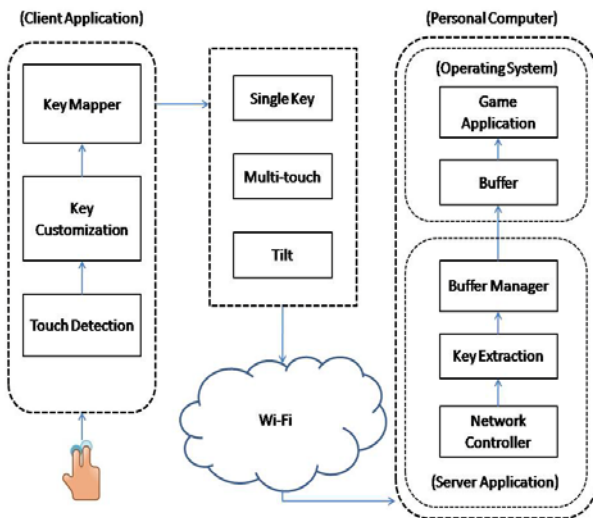


Figure 2: Detailed system architecture

After user touches screen, the data passes through various modules. The client application has 3 modules viz. Touch Detection, Key Customization and Key Mapper. As the name suggests, the Touch Detection module simply detects the touch coordinates and alters data according to need of next module. Key Customization is a GUI (Graphical User Interface) element. Every time user want to play, he gets option to choose game from a list, the buttons on screen will change depending upon the type of game he chose. The user is also able to add/delete new keys if he chose to. The Key Mapper will map a “key” (any key from available on keyboard) to buttons on screen. If user has added any button on screen he should bind that

blank button to a “key”. The Key Mapper is also responsible for detecting Multi-touch and Tilt functions. Depending on users action performed the key packet will be sent to server over Wi-Fi.

On server side, Network controller will be managing multiple connections and the data of key packets received by them. By extracting the content of packet i.e. which key was pressed on mobile by user and whether that key press was done in conjunction with Tilt operation. The extracted data will be sent to Buffer Manager. This module maintains connection with Input Buffer of Operating System. Input Buffer is used by application to receive data from input devices. The server application was processing until now will be placed in Input Buffer and the Game application can pick it up from Buffer. For Cellular phones, some already implemented older systems use hardware kits to integrate communication between phone and computers. But use of cellular technology could induce extra latency in communication [4].

V. CONNECTIVITY ASSESMENT

A. Java Socket Mechanism

Features offered by java like security, portability, multithreading, network support makes it a suitable platform to implement in network systems [5]. Java provides network support in form of Sockets. Sockets are low level programming interface which uses TCP/IP protocol and works on system that have Java Virtual Machine installed. The simplicity of implementation and the implicit security provided by Java Virtual Machine makes socket mechanism a reliable choice.

To implement this communication system, a socket will be created by a server application and it will be waiting for incoming requests. As soon as a request is received the client will be able to send data to server. The actual data communication will be done in the form of stream of packets as client application will be sending single packet each time user performs a touch function on phone screen.

B. Multiplayer through Java Socket Mechanism

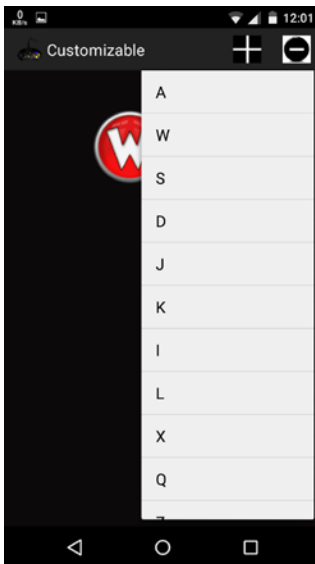
Java provides multithreading to handle multiple threads simultaneously. Multiple threads can be used to handle each client separately. However running multiple threads and each thread handling Buffer separately could cause processing overhead which can introduce delay in performance. Another way we can circumvent the problem is to use single socket to handle multiple clients. Multiple clients can connect single socket creating an illusion of only single device is connected to system. This way, system will identify that only one client is working on established connection and can still process all data sent by multiple clients at a time. If server still want to discriminate between all clients connected, this can be done by checking IP (Internet Protocol) address of each device at the time of accepting request. This method will eliminate the extra latency which our system used to see when using multiple sockets.

VI. ANALYSIS AND USABILITY

To find the actual need of such systems, we did some surveys. The statement of survey was “Gaming Consoles are used extensively in developed countries than developing countries”.

The number of people who agreed with the statement was overwhelming. The reason most people gave is the Cost Factor. Miscellaneous items of console systems increase budget of such systems. Such items include extra controllers and games itself. As a result huge numbers of users move to Personal Computer platform. However being designed for gaming purpose, Consoles provide way more immersive experience than Personal Computers. To get console experience, users tend to buy compatible console controllers for their Personal Computers. So having android Game controllers can significantly reduce cost of system and also add the same immersive experience to Personal Computer platform which is only experienced by console users.

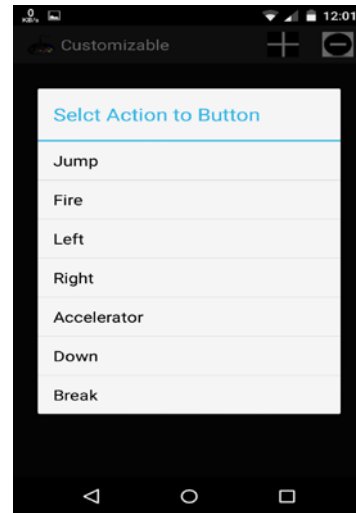
VII. SCREENSHOTS



(1)



(2)



(3)

Screenshots:

- (1): Customizing GUI for a game
 (2): Ready GUI for a game
 (3): Setting Keybind for a key

VIII. FUTURE SCOPE

Our system plans to include support for cloud based data, where users can upload their preferences for customized GUI (Graphical User Interface) for games and other users will get an option to choose from those available GUI if they are interested [6]. Also if user want to get an idea how creatively they can build the GUI they can surf through available GUI's from cloud. This will give chance to user to explore new ways to play games.

IX. CONCLUSION

The proposed system helps to implement features provided by hardware console controller using only android mobiles and their implicit features. This eliminates the need of excess controllers we need to play game on Personal Computer platform. With the use of Wi-Fi connectivity multiple user will be able to deploy this system anywhere they want and can enjoy game by sitting at any distance from the Personal Computer. In the future works, the system can be deployed on mass scale and added reliable features can take users gaming experience to another dimension.

REFERENCES

- [1] http://en.wikipedia.org/wiki/Video_game_console [2] Angel Gonzalez Villan, Student Member, IEEE and Josep Jorba Esteve, Member, IEEE, “Remote Control of Mobile Devices in Android Platform”, 2011.
 [3] Archana Jadhav, Vipul Oswal, Sagar Madane, Harshal Zope, Vishal Hatmode, “Vnc Architecture Based Remote Desktop Access Through Android Mobile Phones”, 2012.

[4] Haeil Hyun, Jonghyun Park, Yunchan Cho, Jae Wook Jeon, PC Application Remote Control via Mobile Phone, 2010

[5] Vaibhav Muddebhalkar, R.M Gaudar, "Fast remote data access for control of TCP/IP network using android Mobile device

[6] http://en.wikipedia.org/wiki/Cloud_database