

Wireless Mouse and Keyboard Using Smartphone

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ABSTRACT

This paper presents the design and implementation of turning smartphones into computer remote controllers which permit users to operate PC wirelessly. Smartphones communicate with the computer by wireless Ad Hoc or Wi-Fi access point network. A computer operator uses a smartphone as the keyboard and mouse of the PC and operates the PC remotely and wirelessly. This kind of system has very wide application in number of environment settings, like conference halls, classrooms, group work project environments, and also our living rooms, where the computer screen is projected onto a large screen, like a projector screen or a large screen TV.

KEYWORDS: Computer remote controller, human computer interface, smartphone, smart device.

INTRODUCTION

There exist numerous circumstances where we want to wirelessly and securely operate a computer, where the computer screen is estimated on a large screen over a projector or big-screen television, such as classrooms, conference/meeting rooms, mobile, workgroup project surroundings and new office surroundings, and also living rooms. Numerous definitely designed devices are obtainable in the market for the purpose of working computers distantly and wirelessly. Wireless keyboard, as shown in Fig. 1.a, uses whichever Bluetooth or wireless USB mini-receiver plugged into the USB port of PC for interaction amongst the keyboard and the PC. Certain wireless keyboards have a touchpad for regulating the mouse cursor. Wireless performance controller, as shown in Fig. 1b, permits user to work there PC distantly for PowerPoint demonstration over Bluetooth link. It typically has some buttons, counting mouse-left, mouse-right, next slide and previous slide buttons (for PPT demonstration), and even a minor size square touchpad for stirring mouse pointer.

Yet, all those devices have definite weaknesses. Wireless keyboard has restricted elasticity and is not suitable for an anchor to carry it everywhere in the area during the demonstration. Anchors commonly like to walk everywhere while demonstrating. Carrying a wireless keyboard is absolutely not suitable. Wireless demonstration controller does have decent flexibility. Though, many of such devices do not permit user to have full process on the PC, like executing a program, stirring or concluding the presentation window, etc. Even it has a small touchpad for stirring mouse pointer (like shown in Fig. 1b), still it is actually tough for the announcer to practice it to move the mouse pointer while they are rambling from place to place. On the other side, a PC is allowed to have only one such device controlling it. If an viewer wants to activate the PC to simplify asking queries or offer comments during the demonstration meeting, they must march to the PC to practice the wired mouse or keyboard, or must get the wireless keyboard or wireless demonstration controller. This inflicts awkwardness when a group of people, such as a development crew or a company core meeting attendees, are having conversation and need to cooperate with each other over the same PC with its monitor anticipated on the wall. The broadly used and very widespread keen devices, like iPads, smartphones, PDAs, and smart game controllers, can be the outstanding replacements as PC remote controllers if we grow suitable apps for them.

1. Minor physical dimension for brilliant flexibility. They are planned for hand holding and booming everywhere. They are preserved and functioned by persons.
2. Decent Human-Computer-Interface. They have minor touch display, a build-in somatic keyboard or soft keyboard, and run easy new operating system with decent graphics user interface.
3. Strong network ability, like Wi-Fi wireless and Bluetooth, permitting Internet access. These devices are designed for multi-purposes, such as personal office, mobile phone, camera, games console, etc. The list of the most popular smart devices include iPad and iPhone from Apple Company, Android smartphone from Google, Windows mobile smartphone and PDA from Microsoft, and various handhold game systems from Nintendo, Microsoft, Sony, and other. Consuming these smart devices is becoming portion of our daily life. Here we learn how to turn smartphones into wireless mouse and keyboard. Next part is described as given below. In section 2 we learn system design of turning smartphones into wireless mouse and keyboard. In section 3 we

learn about the system implementation/software implementation. In section 4 we framework the application. And in section 5 completes the total work.

II. SYSTEM MODEL AND ASSUMPTIONS

In the system shown below number of smartphones can wirelessly connect to the same PC and operators can operate their smartphone keyboard and touch screen to operate the PC.

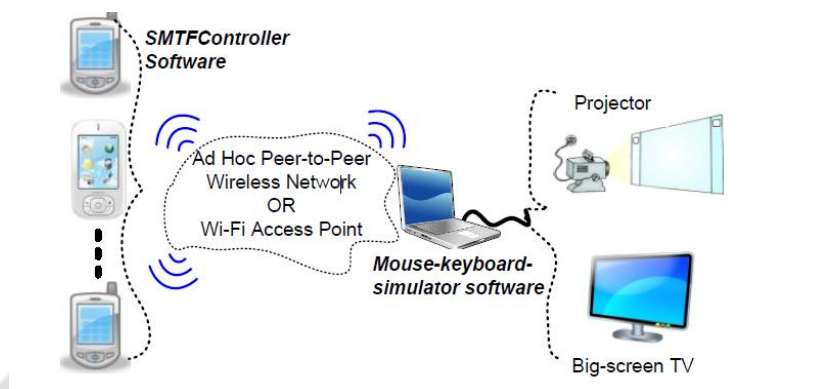


Fig. System analysis

A. Smartphone

A smartphone is a cellular handset with Internet admittance and integral applications. Smartphones can be called as handheld mobile computers unified with a mobile telephone, and it allows users to install different applications in it as requirement which are called as app in it. Smartphones run complete operating system software given that stage for application designers. Windows Mobile OS, Android OS, Blackberry OS, iOS, and Symbian OS are the smartphones more in use. We can develop our own applications for smartphones using this system environment. Smartphones are broadly used as handheld device to operate other devices.

We describes the system design of turning a smartphone into a computer remote controller in this section, by which we develop a smartphone application running on the smartphone and software running on PC. The details are termed below.

B. System Diagram and Architecture

A smartphone typically have in-built wireless network function (Wi-Fi) which allows it to connect to Internet by the wireless access point (WAP). This Wi-Fi ability also permits smartphone to talk to another smart device like PC or another smartphone by peer-to-peer Ad Hoc wireless association or Wi-Fi access point. With help of Wi-Fi competency and developing suitable software, we can create a computer remote controller by smartphone and practice it to function PC wirelessly. This is illustrated in Fig.3. The movements of keyboard and mouse are captured by the application SMTF Controller which is running on smartphones and passes it to the PC by wireless Ad Hoc network or else through WiFi.

The procedures of mouse and keyboard from the smartphones are accepted by "Mouse-Keyboard-Simulator" and by OS processing on PC to put on the keyboard and mouse procedures to regulate the PC, counting program finishing, mouse actions, and keyboard input. The procedures received from mouse and keyboard of smartphones are pretended as they are originated by the mouse and keyboard belonging to the PC. There are different ID's for the different smartphones which perform mouse and keyboard functioning, on the basis of these ID's the computer side decides whether to grant access to that particular smartphone. If we consider the example that number of smartphones are operating the PC simultaneously then the operations received may be replicated by the OS. Else, only the smartphones with control right will be sent to OS to process. When such situation arises, a mechanism is applied to observe the PC control right and achieve correct transmission between number of smartphones.

III. SYSTEM IMPLEMENTATION

There are three software modules basically,

- 1) The communication module handling the communication between smartphones and the computer,
- 2) The smartphone-side software module (SMTF Controller),
- 3) The computer-side software module (Mouse-Keyboard-Simulator).

A. Communication between Smartphones and Computer

SMTFController i.e. smartphone side program communicates with *Mouse-Keyboard-Simulator* i.e. computer side program by Wi-Fi access point or Ad Hoc peer-to-peer wireless connection.

Connection establishment phase:

A request is sent to network with the help of UDP packets which carries the IP address and unique phone ID. This is to show that user using the smartphone does not need to know the IP address of PC when he wants to connect smartphone to the PC. The *Mouse-Keyboard-Simulator* replies the request by sending UDP packets to smartphones, which carries the PC's IP address and information. When smartphone receives the ACK packet from the PC, the smartphone has PC's IP address and other required information. Now both the sides have each others IP address and port numbers, so the message between them is swapped from UDP broadcast mode to peer-to-peer UDP mode.

Regulation communication phase:

In this phase, all data is communicated by the peer-to-peer UDP mode. Maximum data communication is from smartphone to the PC because of mouse and keyboard events. This data is lead from smartphones to the PC in finest work to achieve smooth procedure.

B. Smartphone-Side Software Implementation: *SMTFController*

The smartphone-side software, *SMTFController*, is a typical smartphone application, which turns the smartphone keyboard into the computer keyboard, and its touch screen into the computer mouse touchpad, thus allows the user to operate the computer through the smartphone.

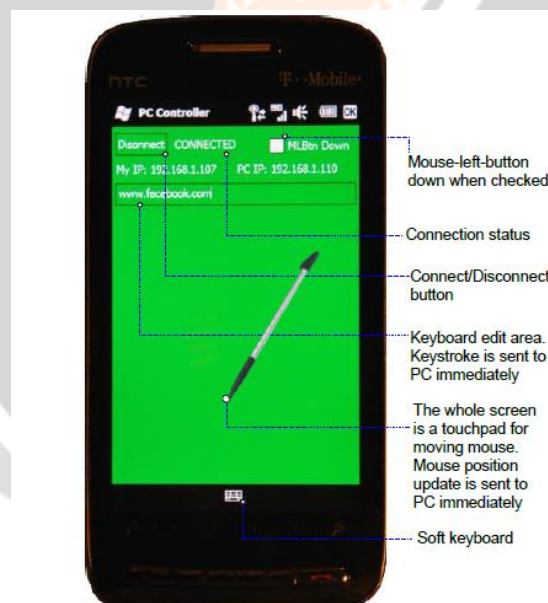


Fig. SMTF Controller

IV. CONCLUSION

This paper explains how the smartphone can be used in more specifically as a smart device. It gives more prominent way of handling PC comfortably. Computer can be used wirelessly using application explained above. This application simulates wireless keyboard and mouse to operate a computer system. The application has wide applications in conferences, classrooms, meetings, etc. We are looking for further more application fields.

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