

Wireless Pro-scanner

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Abstract : We present a projector player system with wireless network. This paper gives the hardware and software architecture of the player system, and discusses the design in detail. Today's projector are connected to any device like computer, laptop, etc. using HDMI cable. So it becomes difficult to connect or project data from a device at a distance more than the length of HDMI cable. And it is also difficult to connect multiple devices since only one HDMI port exists. Personal computers today have 802.11 (b/a/g) -based wireless connectivity. By connecting laptops to a projector wirelessly, multiple persons could connect to the projector and present the content on their laptops not simultaneously but one at a time as all the user data will be saved in player memory. This typically requires a receiver at the projector end that is wirelessly connected to the laptop/mobile and which receives, decodes the data and give input to the projector. Controller Raspberry Pi 2 model B along with wireless module can be used to achieve the aim of Wireless Data Transmission and projection on projector.

Keywords: Android, Projector, Raspberry pi, Wireless, hotspot

I. Introduction

An interactive wireless player system for projector with android control. Easy to project files and documents from mobile and laptops wirelessly. Easy to make/edit ppt, docx, etc, file on player system. Wired projection is an issue of concern as it uses HDMI cable which limits the distance and hence it becomes necessary to implement wireless technique. Since most of the devices use Wi-Fi or Bluetooth it can be used to project documents. Currently most of the projectors are used using HDMI cable or USB cable. We are making a device or system which is connected to projector for receiving data wirelessly from different devices and which acts as an alternative medium to wired HDMI or USB cables between a projector and media or document device like laptops, etc. Thus will lead to distant projection. The second part consists of scanner which includes using of Camera module to achieve the aim of scanning part. With the camera module one can take image as well as perform live streaming of video.

II. Overview of automatic player system

We have three key ideas to design an automatic projector player system, and the new player system will resolve above problems for general applied scenes of projector, which presents common files such as Word files, PowerPoint files, PDF files, JPG files, MPEG files and so on.

1. Receiver System Independent of PC

In general applied scenes of projector, since we just present files belong to common types, so we do need not a costly and immovable PC to play these files. We choose embedded system to replace the PC, and the specified embedded system can do the playing work best than traditional PC in many aspects. It is also not necessary to continuously plug our PC to projector so anybody can attach a pen-drive to view files. Instead a less power consuming receiver system can resolve the problem.

2. Projector with No Cable Layout

Conventional Projector has to be pulled and plugged from one PC to another PC continually. The new player system we recommended takes IEEE 802.11b wireless protocol, so PC can connect to the player system over wireless network.

3. Uniform Control Way

An app which will control device, which can operate both player system remotely. This app can be used as a mouse and keyboard and can be used to operate on documents.

III. block diagram

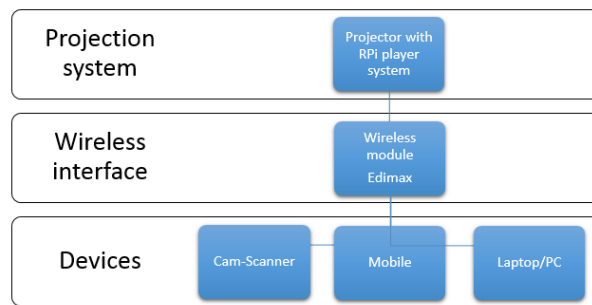


Fig.1 Block diagram of RPi player system

IV. hardware

1. Raspberry pi 2 model B

Specifications: A 900MHz quad-core ARM Cortex-A7 CPU, 1GB RAM, 4 USB ports, 40 GPIO pins, Full HDMI port, Ethernet port, Combined 3.5mm audio jack and composite video, camera interface (CSI), Display interface (DSI), Micro SD card slot, Video Core IV 3D graphics core. The raspberry pi acts as a small computer in player system.

2. Edimax

Specifications: Complies with draft IEEE 802.11ac standard and backward compatible with wireless 802.11a/n standards, Wireless connectivity on 5GHz band, reducing wireless interference, Maximum Wi-Fi speeds of 433Mbps (5GHz), Nano, stylish and minimal design, it is perfectly fits your laptops, Features WEP64/128-bit, WPA, WPA2, 802.11x encryption, Features easy setup wizard, Supports Mac OS 10.7~10.9 and Windows XP/Vista/7/8/8.1

Configuration

```
lsusb
```

```
lsmod
```

```
iwconfig
```

```
sudo nano /etc/network/interfaces
```

Make sure the following lines are added to (or un-commented in) your file

```
auto wlan0
```

```
allow-hotplug wlan0
```

```
iface wlan0 inet manual
```

```
wpa-roam /etc/wpa_supplicant/wpa_supplicant.conf
```

After modifying the network interface configuration file, we need to create the wireless configuration file. Use the following command to create (or edit) this file.

```
sudo nano /etc/wpa_supplicant/wpa_supplicant.conf
```

Add the following data to this wireless configuration file. (Replace the "_SSID_" and "_WPA_SHARED_KEY_" text with your actual SSID and WPA key values.)

```
network={
ssid="_SSID_"
proto=RSN
key_mgmt=WPA-PSK
pairwise=CCMP TKIP
group=CCMP TKIP
psk="_WPA_SHARED_KEY_"
}
```

Once the configuration files are complete, use the following command to restart the wireless adapter / interface.

```
sudo ifup wlan0
```

```
ifconfig wlan0
```

3. USB camera

Specifications: HD video calling (1280 x 720 pixels) with recommended system, Video capture: Up to 1280 x 720 pixels, Photos: Up to 3.0 megapixels (software enhanced), Built-in mic with noise reduction, Hi-Speed USB 2.0, Universal clip fits laptops, LCD or CRT monitors

V. Software

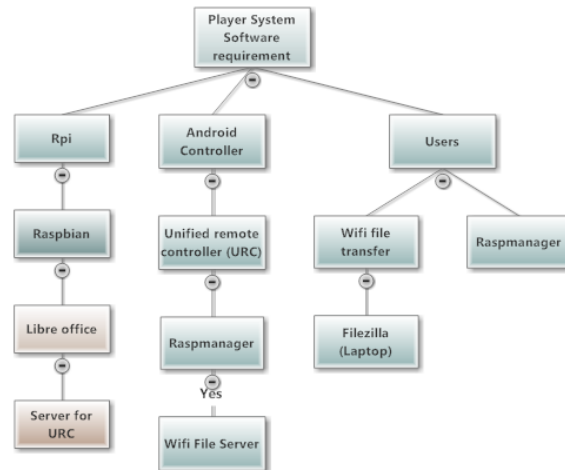
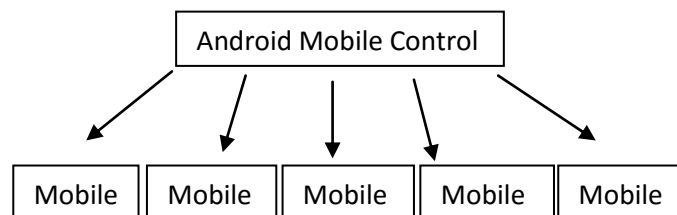


Fig.1 Software requirements block diagram

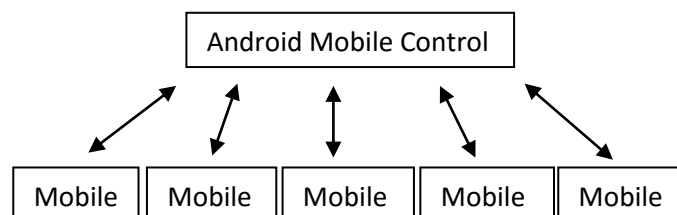
1. Raspbian Wheezy
Operating system installed in Raspberry pi 2 model B. Different operating system are also available. One can download according to their wish. As it comes with over 35,000 packages, pre-compiled software bundled in a nice format for easy installation on your Raspberry Pi.
2. Libre office
Software for viewing and editing presentations and word files.
Code in LX terminal of raspberry pi:
sudo apt-get update
sudo apt-get install libreoffice
3. Unified Remote Control App
Android application to make raspberry pi free from mouse and keyboard hardware and it works over wifi connection. The app is to be installed in mobile and the server is to be configured in the hardware.
4. Raspmanager
Application which gets connect over wifi connection to raspberry pi and can be used to manage or share files between raspberry pi and mobile devices.

VI. topology and protocols

1. Topology used for sharing application to mobile: Star topology
The application which is transferred from Android Mobile Control to different mobile is Wifi File Transfer



2. Topology used for sending files from mobile to Raspberry pi : Star topology
The files transferred from mobile to Raspberry pi using Raspmanager.



VII. Implementation

The Raspbian operating system is written on SD card using Raspbian Wheezy image file and win32disk imager and Libre office packages are installed in the raspberry pi hardware. It is The Edimax adapter also require installation on hardware using internet the packages can be installed. After configuring Edimax as a Hotspot devices mobile devices can be connected to raspberry pi. To eliminate mouse and keyboard an application called Unified Remote control is installed and configured to raspberry pi. The raspberry pi which acts as a player system is connected to Projector using HDMI to VGA converter and male to male gender changer. Once the setup is made multiple devices can send data to raspberry pi using Rasp-manager and project files on projector. The scanner part consisting of USB camera interfaced to raspberry pi by using motion installations packages available on internet. After installation one can stream video on browser of RPi as well as the corresponding image can be taken and stored in raspberry pi.

VIII. result and discussion

We have used Raspberry pi 2 model B, Edimax adapter, HDMI to VGA converter to provide an innovative solution to projection method. As older method involved using laptop and projector with wired VGA cable connection with projector. This method had limitation on distance as well as devices getting connected to projector. The new method involves using of Wi-Fi technology due to which the system became wireless and has eliminated use of HDMI cables as well as Laptops. In this method we connected multiple mobile/laptop to the raspberry pi using Edimax for Hotspot creation. We shared the files between mobile/laptop and raspberry pi. Various files of MS power point, MS word, MS excel were displayed on the Raspbian operating system. Using the new method it is not necessary to carry laptops as the player system we made will be connected to the projector and transmission of files will be wireless using Android application. The scanning part is achieved using the camera and displaying in browser using IP address 192.168.10.1 which is same as IP address of Raspberry pi.

IX. Conclusion

The player system is successful in establishing wireless projection using projector. The raspberry pi is a small PC which is an alternative to bulky laptop used during projection. The use of Edimax adapter which is a wireless trans-receiver and the HDMI to VGA converter finally eliminated the use of long VGA cables. The distant projection is now possible using mobile app which is interfaced to player system as shown in the output result. Multiple devices can connect to raspberry pi and transfer the data to the player system for projection. Unified remote control has eliminated the use of mouse and keyboard on raspberry pi.

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