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RESEARCH ARTICLE

THE VIRTUAL TOUCH SCREEN IN COMPUTERS BY ACCELEROMETER SENSORS

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Abstract: The paper presents enabling the virtual touch screen in computers by accelerometer sensors. In present days, few electronic devices are used to capture the image with integrated cameras and store the same image onto integrated Flash memories based on touch screen. This is especially true of Smart phones. But, the smart phones are not guarantee the projector image or content dimensionality uniform. Our aim is to display the content in a large format based on touch screen. In the paper, Pico projector is used as display device.

Index Terms — Virtual Touch screen, Interactive Display, micro controller and zigbee

I. INTRODUCTION

MANY image applications are attractive for the capability to deflect a laser beam at high speed has let resonating MEMS mirrors [1] and for application in laser projection displays [2, 3] early on. MEMS scanning mirror based projection solving the limitation of insufficient screen size of portable electronic devices such as mobile phones, digital cameras or media players and so on. Either small enough to be incorporated directly into these portable devices or used as an accessory module, MEMS scanning mirror based projection displays larger screen sizes than the portable devices themselves. Micro Vision's single MEMS mirror is a metal-on-silicon double gimbaled disc made with standard lithographic processes [4].

In this work uses the 89c52 micro controller to display the content in large size in Pico projector. Pico projector is also called mobile projector or handheld projector which has sufficient capacity of materials.

II. TYPES OF PROJECTORS

In the past days, so many projectors are used to display the content from virtual touch screen.

A. single mirror laser projector

It used in smart phones. It is ability interact between projected photon and touch user. This laser projector collects light from the width and height of the surface of smart phones. It is fast scanned the content and no need additional cost.

B. LCD projector

It is a simple system and using LCD light gates, business and home theatres. The main drawback is the visible on screen door or pixilation effect.

C. DLP projector

DLP projector is also known as digital micro mirror device. The main aim is to refreshes the modulate color to get rotating color wheels in time. The main problem is visible rainbow when the people's eyes are moving.

III. PROPOSED METHOD

The block diagram of proposed method at transmit section is shown in figure 1

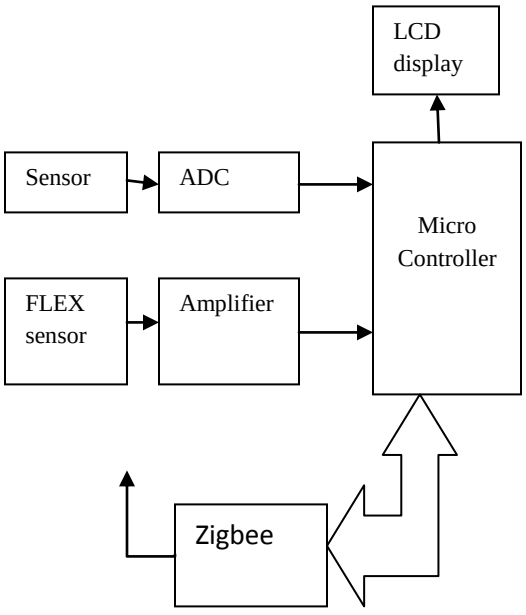

Fig.1. block diagram of transmitter of proposed method.

The fig.1 shows the accelerometer sensor is analog signal which is connected to analog to digital convertor and followed by 89c52 microcontroller. After that the digital signal is display the Pico projector through serial communication from micro controller. In this paper, we use the 89C52 micro controller as explain in sub section a. the flex sensor is connected to amplifier and by micro controller. The combination of flex sensor and amplifier is used for clicking operation.

The block diagram of proposed method at receiving section is shown in fig.2

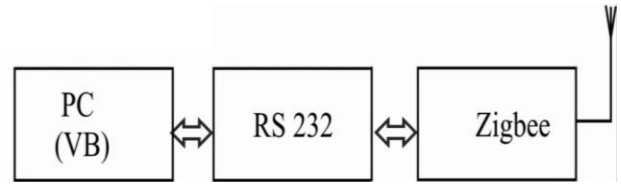

Fig.2. the receiver of proposed method

Displaying the project content in large format which the computer is connected to zigbee device at the receiver as shown in fig.2

A. 89C52 micro controller

Many applications such as digital entertainment, portable devices are used 89C52 micro controller to reduce low unit cost, reliable and high accuracy. 89C52 micro controller is family of 8059 and built in I/O devices & memory. It contains four ports, 40 pins and dual inline. In micro controller, analog to digital convert device s connect to serial control register (SCON). The Pico projector display is connected to XTAL pin.

The pin diagram of micro controller 89AC52 as shown in figure 3. In micro controller, ports 0 is output and input drivers and port 2 are output drivers which is access to external memory. The port 0 output generates the low byte of external address and port 2 generates the high byte of external address. All the Ports in micro controller AT89C52 are multifunctional. The alternate functions can only be activated if the corresponding bit latch in the port SFR contains a 1. Otherwise the port SFR contains a 0. The micro controller 89C52 is less cost, high feature than the other micro controller.

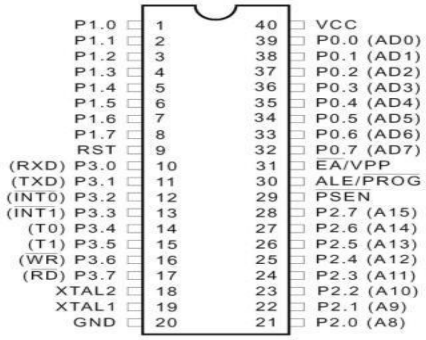

Fig 3: Pin Diagram Of micro controller 89c52

B. **Accelerometer sensor**

Accelerometer sensor is a sensor which can used to measure the inertial forces from virtual touch screen. It is also measure the speed changes from tough screen. The accelerometer sensor is converting the mechanical sensing element in to an electric output and then transmits to analog to digital convertor device. The accelerometer sensor can understand the mechanical motion using Newtonian mechanics. The concept of accelerometer sensor as shown in figure.4.

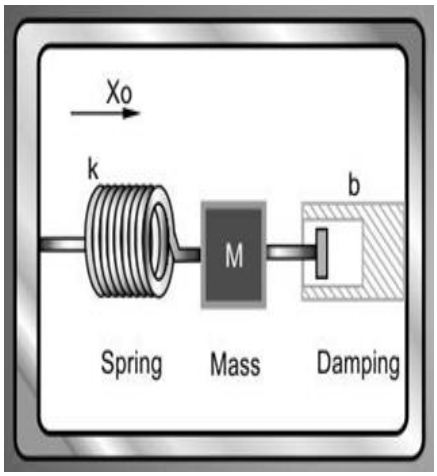

Fig.4 concept of accelerometer sensor

In figure 4 shows the spring is attached to mass and then connected to damping. The damping is used to desirable frequency from computer; otherwise system is oscillating at natural frequency. In fig 4, M = mass of the body, xo = Relative movement of the proof-mass with respect to the frame C = Damping coefficient, k = Spring stiffness

Then Summation of all forces on proof mass is equal to zero

$$ma + Fd + Fs = 0$$

$$ma = - Fd - Fs$$

$$ma = - cx - kx$$

$$a = - (c/m) x - (k/m) x$$

C. Analog-Digital Converter (ADC)

The ADC device is used to convert the continuous sensor signal to digital signal. It handles the quantized errors when the signal is quantized.

D. Flex Sensor

Flexion sensors, is used to measure the amount of deflection caused by bending the sensor. Flex sensor is a sensor to used to bend the sensor at different angle depend on change of electrical resistant. In flex sensor, if bend the sensor at low radius to get the higher resistant value. The nominal resistance of flex sensor is 10,000 ohms (10 K). As the flex sensor is bent in either direction the resistance gradually decreases. The operating temperature is -45F to 125F. It is less sensitive and used in pressure sensor.

E. ZigBee

It is a small packet device and used to communicate the signal one device to another device. It is IEEE 802.15.4 standard and communicates the signal at low power consumption. The aim of zigbee is transmit the signal to computer at low power consumption and low data rate.

F. LCD Display

It is used to display the content at large format. In this work, we have used the 16*2 LCD device that means display 16 characters per line and there are 2 such lines. This 16*2 LCD display contain 2 registers, namely, command (CR) & data. The command register (CR) stores the command instructions given to the LCD.

A CR is an instruction given to LCD to do a predefined task like initializing it, clearing its screen, setting the cursor position, controlling display etc. The data register stores the data to be displayed on the LCD. The data is the ASCII value of the character to be displayed on the LCD.

The diagram of LCD as shown below

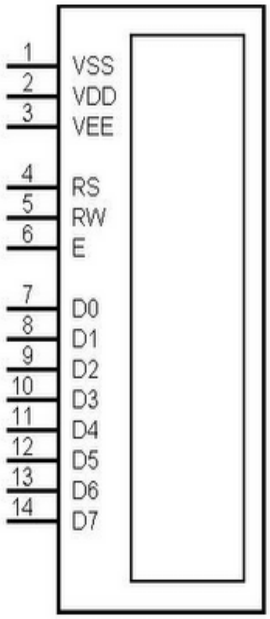

Fig 5: Diagram of 16*2 LCD display

IV. CONCLUSION

The paper presents to display the content in a large format based on touch screen and 89C52 micro controller. The micro controller is to reduce low unit cost, reliable and high accuracy. 89C52 micro controller is family of 8059 and built in I/O devices & memory. The Pico projector is guarantee to uniform of projector content dimensionality and display the image or content in large format.

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