Hand Gesture Based Multiple Application

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Abstract-Now a days, in the world where every operations performed by human are getting simple, in order to make it simpler and an innovation which makes use of HAND GESTURE. Hand Signal Transceiver system will be introduced for the medical purpose only. Then the transceiver will detect several hand gestures and sent out the corresponding information which will be received by another transceiver and also it will be displayed on a LCD screen. System design will cover both hardware and software implementation of wireless system. Then four various types of features are extracted from the three kinds of sensory data to describe the static hand posture and dynamic gesture trajectory characteristics in hand gesture. Finally decision-level multi-classifier fusion method is implemented by the hand gesture pattern classification.

I. INTRODUCTION

In Recent years have seen a tremendous growth in novel devices and techniques for human-computer interaction (HCI). These draw upon human-to-human communication modalities in order to introduce certain innate and ease to the HCI. In particular, interfaces incorporating hand gestures have gained popularity in many fields of application. We are concerned with the automatic visual interpretation of dynamic hand gestures and study these frameworks of an in-vehicle interface. A real-time, vision-based system is developed, with the goal of robust recognition of hand gestures performed by driver, physical challengers and passenger users. The techniques and analysis extend too many other application fields requiring hand gesture recognition in visually challenging, real-world settings.

II. BLOCK DIAGRAM

TRANSMIT:
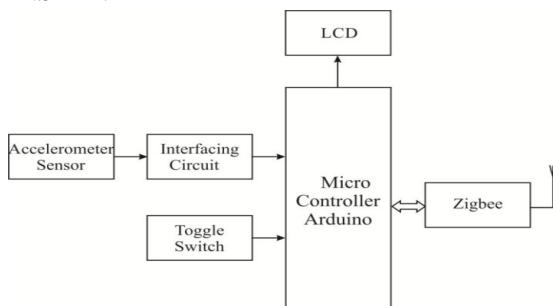
RECEIVER:-
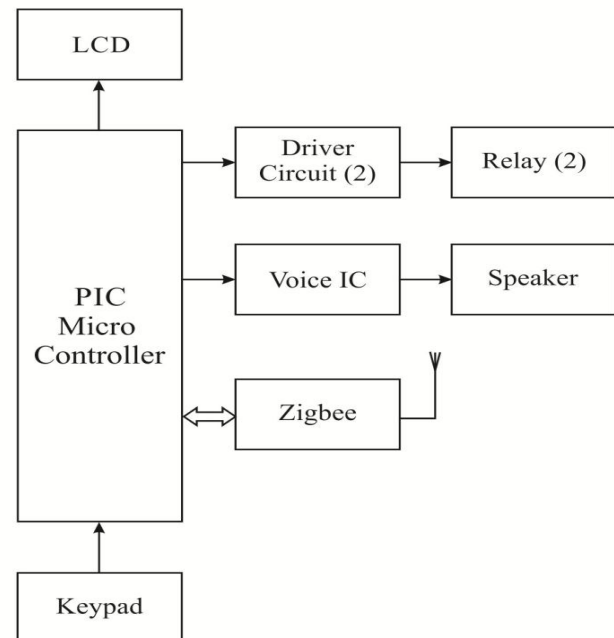
III. HARDWARE DESCRIPTION

ARDUINO UNO: -

Arduino/Genuin Uno is a microcontroller board based ATmega328P . It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, ICSP header and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. You can pan with your UNO without worrying too much about doing something wrong, worst case scenario you can replace the chip for a few dollars and start over again.

In the term "Uno" means one in Italian language and was chosen to mark the release of Arduino Software (IDE) 1.0. The Uno board and version 1.0 of Arduino Software (IDE) were the reference versions of Arduino, now evolved to recent releases. The Uno board is the first in a series of USB Arduino boards, and the reference model for the Arduino platform; for an extensive list of current, past or outdated boards see the Arduino index of boards.

- On the Software on the Arduino Forum

- On Projects on the Arduino Forum
- On the Product itself through our Customer Support

IC PROG:-

The PRO MATE II is a Microchip microcontroller device, it is software. Through interchangeable programming socket modules, PRO MATE II enables you to quickly and easily program the entire line of Microchip PIC micro microcontroller devices and many of the Microchip memory parts.

PRO MATE II may be used with MPLAB IDE running under supported Windows OS's, with the command-line controller PROCMD or as a stand-alone programmer. DIAGRAM OF PIC 16F877
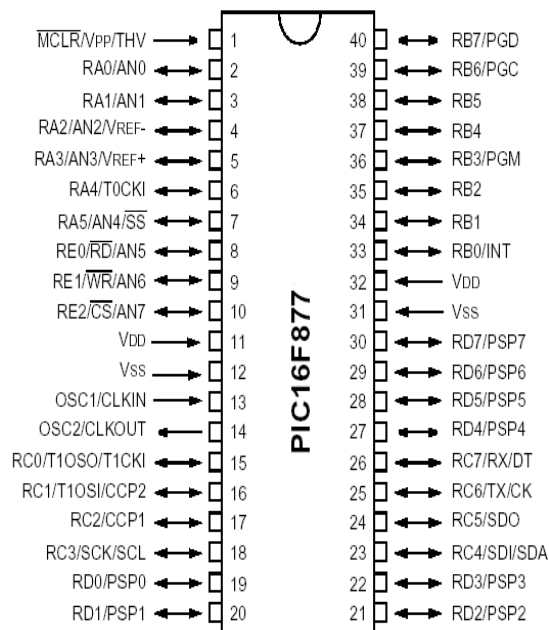
Memory Organization:

PIC16F877 MUC's have consists of three memory blocks in each. The program memory and Data Memory have separate buses so that concurrent access can occur.

Program Memory Organization:

A 13-bit program counter capable of addressing 8K *14 words is present in PIC16F877 of FLASH program memory. Accessing a location above the physically implemented address will cause a wraparound.

The RESET vector is at 0000h and the interrupt vector is at 0004h.

Data Memory Organization:

The data memory is partitioned into multiple banks which is containing the General Purpose Registers and the special functions Registers. Bits RP1 (STATUS<6) and RP0 (STATUS<5>) are the bank selected bits. Each bank expands up to 7Fh (1238 bytes). The lower locations of each bank are reserved for the Special Function Registers. Above the Special Function Registers are General Purpose Registers, implemented as static RAM (special function registers).

III. LCD DISPLAY

Introduction: -

Liquid crystal display (LCD) has materials which combine the properties of both liquids and crystals. Rather than having a melting point, they have a temperature range within which the molecules are almost as mobile as they would be in a liquid, but they are grouped together in an ordered form similar to a crystal.

An LCD consists of two glass panels. And the liquid crystal material sand witched in between the glass panels. The inner surface of the glass plates are coated with transparent electrodes which define the character, symbols or patterns to be displayed.


Power supply:-

The power supply circuits consists of filters, rectifiers, and then voltage regulators. Starting with an ac voltage, a steady dc voltage is obtained by rectifying the ac voltage, then filtering to a dc level. And finally, regulating to obtain a desired fixed dc voltage.

Accelerometer: -

An accelerometer is a device that measure proper acceleration, the acceleration experienced relative to freefall.

Single- and multi-axis models are available to detect magnitude and direction of the acceleration as a vector quantity. It can be used to sense the orientation, acceleration, vibration shock, and falling. Micro machined accelerometers are increasingly present in portable electronic devices and

video game controllers. It is use to detect the position of the device or provide for game input
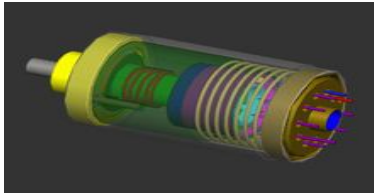
Toggle Switch:-

A toggle switch is an electrical switch that are manually actuated by a mechanical lever, handle, or rocking mechanism.

The word "toggle" is a reference to a kind of joint or mechanism consisting of two arms, connected with an elbow which are almost in line with each other, -like pivot. However, the phrase "toggle switch" is applied to a switch with a positive snap-action and a short handle, whether it actually contains a toggle mechanism or not.

In electronics, a switch is an electrical component that can interrupting the diverting or current it from one conductor to another and it can be break an electrical circuit,.[1][2] The most familiar form of switch is a manually operated electromechanical device. The device have one or more sets of electrical contacts.

ZIGBEE:

ZigBee is a high-level communication protocols used to create personal area networks with small, low-power digital radios, such as for home automation, medical device data collection, and other low-power low-bandwidth needs, designed for small scale projects that needs wireless connections. The ZigBee specification is a combination of the 802.15.4 specification and Home RF Lite. The spec operates in the 2.4GHz (ISM) radio band - the same band as 802.11b standard, Bluetooth, RF and some other devices. It is capable of connecting up to 255 devices per network. ZigBee presents itself as a much better performance when compared with

UWB, Wi-Fi, and Bluetooth [12]. The specification supports rate of data transmission up to 250 Kbps at a range of up to 30 meters. ZigBee's technology has a speed lesser than 802.11b (11 Mbps) and Bluetooth (1 Mbps) but it consumes less power. The zigbee technology is used due to its low-cost and low-power characteristics [13]. It provides a set of communication protocols for low data-rate and short-range wireless networking [14] [15].

RELAY:-

A relay is an electrical switch. Current flowing through the coil of the relay creates a magnetic field which attracts a lever and changes the switch contacts. Relays allow one circuit to switch a second circuit which can be completely separate from the first.


Advantages:

> ➤ Low cost
> ➤ Easy to commutate other persons

Application: -

This project is very useful for dumb people and speech impaired people.

Result: -

This work contributes towards the development of home automation system. Energy savings and user convenience are two major design considerations for these systems. PLCC transceiver is used to control a building using the existing power line without any extra wirings. The ZigBee transceiver is used to control the appliances without any wired connections. Figure 8 shows the experimental result obtained through the proposed system. Four loads have been considered, with two loads are controlled by PLLC technique and the remaining two loads are controlled by Zig-Bee network. It is observed from the results that the effect of wireless interference on the proposed smart home control network is largely reduced.
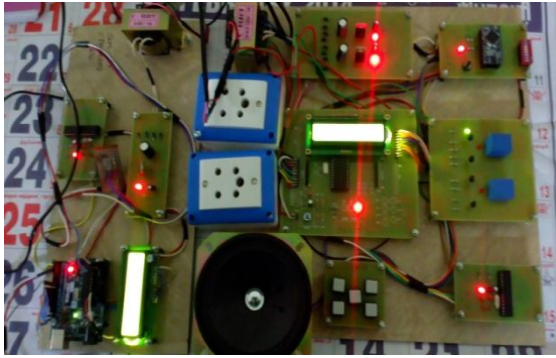
IV. CONCLUSION

Thus the systems have been used to receive the data from the sensing devices and are made to be received by the ZigBee. We have integrated the ultrasonic, accelerometer sensor data in order to detect obstacles, and to obtain more detailed regarding the dumb environment. Evaluations of the system that we have developed have been conducted by attaching the prototype to the handle of the glove. The project results have reflect the usefulness of the system in allowing dump people to move independently, safely and quickly among obstacles and hazardous place.

REFERENCES

[1] Siddharth S. Rautaray. Anupam Agrawal, "Vision based hand gesture recognition for human computer interaction: a survey", Artificial Intelligence Review DOI 10.1007/s10462–012-9356-9 Publisher Springer Netherlands, no. 06, Nov 2012.

[2] Pratik Bhat, Deval Mehta, Nirav Faraswami, "Apparatus And Method For Gesture Recognition", G.H.Patel College Of Engineering And Technology V.V.Nagar Gujarat Technological University Ahmedabad, 2012, [online] Available:
http://www.scribd.com/doc/98493280/Complete-8th-Sem-Report#scribd.

[3] WANG Xiaoli, XU Yang, "Senior Design Project Wireless Hand Signal Transceiver for Soldiers Manual Report", [online] Available:
https://courses.engr.illinois.edu/ece445/getfile.asp?id=5159.

[4] Nattapong Tongrod, Shongpun Lokavee, Teerakiat Kerdcharoen, "Gestural System Based on Multi-functional Sensors and ZigBee Networks for Squad Communication", Defense Science Research Conference and Expo (DSR) 2011.

[5] ARM 7 LPC2148 Controller Manual Data Sheet, [online] Available:
http://www.nxp.com/documents/user_manual/UM10139.pdf.

[6] Accelerometer ADXL335 Sensor Manual Data Sheet, [online] Available:
http://www.analog.com/static/imported-files/data_sheets/ADXL335.pdf.

[7] Zigbee wilreses network device Manual Data Sheet, [online] Available:
http://ftp1.digi.com/support/documentation/90000982_P.pdf.

[8] ULCD Touch Screen LCD Manual Data She et, [online] Available:
http://www.4dsystems.com.au/downloads/microLCD/uLCD-32PTU-Datasheet-REV1.5.pdf.

[9] Steve Furber, ARM System-On-Chip Architecture.

[10] P. Varcholik, J. Merlo, "Gestural Communication with Accelerometer-based Input Devices and Tactile Displays", Proc. 26th Army Science Conf. US Army Science Conf. rlando, December 2008.