

Unauthorized Person Entry Prevention Device Utilizing Sensor

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ABSTRACT: Number of Disabled Persons depends upon their disability revealed in current Census in the districts of Nagapattinam, Thanjavur, Tiruvarur, Cuddalore, Puducherry, Coimbatore, Erode, The Nilgiris, Karur, Perambalur and Pudukottai reported the values are estimated as 33,839, 32,314, 24,013, 39,503, 30,189, 15,738, 66,695, 21,456, 15,342, 34,172 and 40,289. So the research work is focused to mainly support the disabled who are helpless and they may need a protection when they are alive alone in house when their family members are going to do some job. This Unauthorized person entry prevention circuit consists the PIC Microcontroller PIC16F877A as a heart to control other sensor units such as GSM Module, Voice Board, ULN 2009 and Vibrating Sensor. Using MATLAB Open CV the images of persons of the disabled relative and friends recorded when a new person entered to house the saved images matched with the new entry if it is not matched the voice sensor announces Unauthorized person entered to the house if the images matched voice sensor announces Authorized person entered to house, a vibration sensor fitted in the main door of the house if the unauthorized person may be a thief or robber may vulgarly break the door that time the GSM module send SMS to the persons relative mobile numbers and police station saved in program. In this way the device prevent the life of the disabled so they can feel free and happy there may be a E-attender for their security like a human. This circuit applicable to the nature of the disabled persons who may utilized are Visually impaired, Leg Impaired, Hearing Impaired, Polio attacked, Old aged persons, Paralysis attacked. The same circuit designed with the same logic compatible with ARM LPC2148 Microcontroller also. This device is also utilized a normal man for security purpose when they went away their family members are monitored by the device if they met a sudden attack by robbery like crime this device communicated the owner of the house or a normal man.

KEYWORDS: ARM Microcontroller LPC2148, GSM Module, MATLAB, Open CV, PIC Microcontroller 16F877A, Specially Abled Persons, ULN 2009, Voice Board.

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I INTRODUCTION

In recent years specially abled persons (disable) suffered lot do their daily works they may need a support of other persons. So the economic status of their family is questionable, they may need other support for money to satisfied their needs. Keep in mind this situation a care taking and security device developed using vibration sensor, voice sensor and GSM module to render support the disable. Hence the other person in the same family who is always with the disable went away to do job and the disable is more safe if the disable met a threat by somebody the other person in the same family get SMS alert for the threat, in this way this device planned to replace the manual support and increase the safety hundred person for the disable when they are alone.

II MATERIAL AND METHOD

2. System Requirements

2.1 Voice board:

When there is a crime arises whenever people vulgarly tap/break the door to alert the surrounding persons this sensor announces the status.

2.2 Vibration sensor:

During the violent breakup of the door the DC motor run and lock the door very hardly so an unauthorized person cannot moved into the house

2.3GSM/GPRS Module:

GPS: Global Positioning Service gives the location of wherever there is a threat as Latitude and Longitude and sent SMS of Latitude and Longitude to particular registered number using GPRS technology

GPRS: General packet Radio Service sent MMS of the captured image to particular registered number using GPRS technology or using further evidence about the crime.

III SYSTEM ARCHITECTURE

Fig.1 show the proposed model

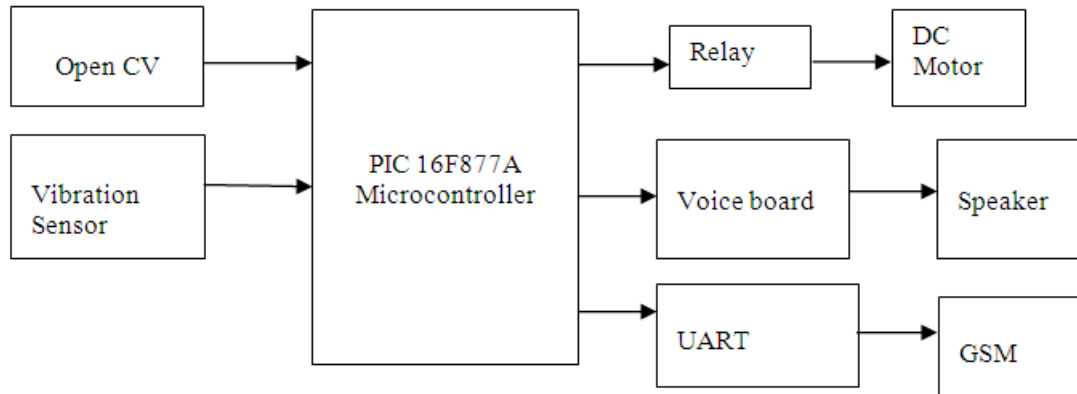
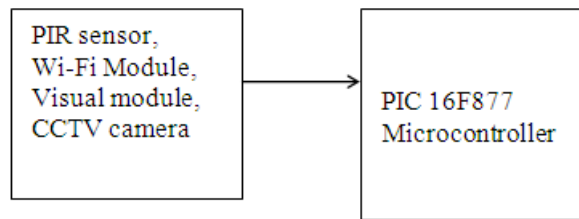


Fig.2 Existing Model



The fig.1 shows the our own developed model and the fig.2 existing model from the prior work it is designed by our self to give a comparison of our research

IV SYSTEM HARDWARE

4.1Voice board:

The APR9600 experimental board is an assembled PCB board consisting of an APR9600 IC, an electret microphone, support components and necessary switches to allow users to explore all functions of the APR9600 chip. The oscillation resistor is chosen so that the total recording period is 60 seconds with a sampling rate of 4.2 kHz.fig.3 shows the voice board hardware



APR9600 Experimental board

Fig.3 Voice board

During sound recording, sound is picked up by the microphone. A microphone pre-amplifier amplifies the voltage signal from the microphone. An AGC circuit is included in the pre-amplifier, controlled by an

external capacitor and resistor. If the voltage level of a sound signal is around 100 mV peak to-peak, the signal can be fed directly into the IC through ANA IN pin. Analogue circuit controlled by an external capacitor and resistor. This device offers true single-chip voice recording, non-volatile storage, and playback capability for 40 to 60 seconds. Advanced Flash non-volatile memory process, where each memory cell can store 256 voltage levels. This technology enables the APR9600 device to reproduce voice signals in their natural form. It eliminates the need for encoding and compression, which often introduce distortion.

4.2 Vibration sensor:

Fig.4 show the vibration sensor hardware, Sensor SW-420 Single-roller type full induction trigger switch. When no vibration or tilt, the product is ON conduction state, and in the steady state, when a vibration or tilt, the switch will be rendered instantly disconnect the conductive resistance increases, generating a current pulse signal, thereby triggering circuit. These products are completely sealed package, waterproof, dustproof. Principle Usually at any angle switch is ON state, by the vibration or movement, the rollers of the conduction current in the switch will produce a movement or vibration, causing the current through the disconnect or the rise of the resistance and trigger circuit. The characteristics of this switch is usually general in the conduction state briefly disconnected resistant to vibration, so it's high sensitivity settings by IC, customers according to their sensitivity requirements for adjustments.

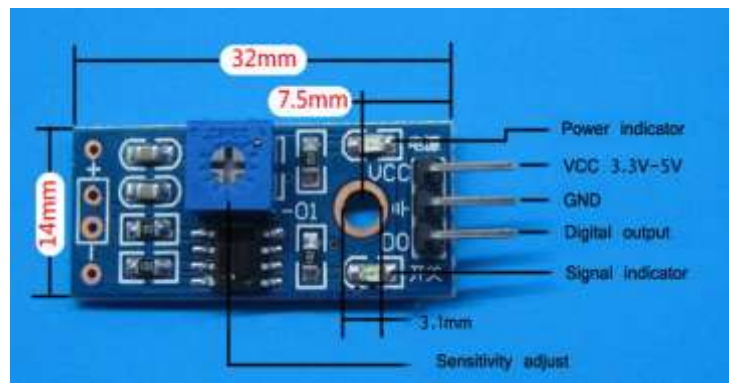


Fig.4 Vibration Sensor

4.3 GSM Module:

GSM (Global System for Mobile) / GPRS (General Packet Radio Service) TTL -Modem is SIM900 Quad-band GSM / GPRS device, works on frequencies 850 MHz, 900 MHz, 1800 MHz and 1900 MHz. It is very compact in size and easy to use as plug in GSM Modem. The Modem is designed with 3V3 and 5V DC TTL interfacing circuitry, which allows User to directly interface with 5V Microcontrollers (PIC, AVR, Arduino, 8051, etc.) as well as 3V3 Microcontrollers (ARM, ARM Cortex XX, etc.). The baud rate can be configurable from 9600-115200 bps through AT (Attention) commands. This GSM/GPRS TTL Modem has internal TCP/IP stack to enable User to connect with internet through GPRS feature. It is suitable for SMS as well as DA T A transfer application in mobile phone to mobile phone interface. The modem can be interfaced with a Microcontroller using USART (Universal Synchronous Asynchronous Receiver and Transmitter) feature (serial communication).

Technology

Webcams, CCTV Surveillance, CCD cameras are used to monitor the unauthorized person entry

Video security

Webcams, CCTV Surveillance, CCD cameras are also used as security cameras. Software is available to allow PC-connected cameras to watch for movement and sound, recording both when they are detected. These recordings can then be saved to the computer, e-mailed, or uploaded to the Internet. In one well-publicized case, computer e-mailed images of the burglar during the theft of the computer, enabling the owner to give police a clear picture of the burglar's face even after the computer had been stolen.

4.4 The PIC Micro Controller

Features:

High-Performance RISC CPU:

- Only 35 single-word instructions to learn
- All single-cycle instructions except for program branches, which are two-cycle
- Operating speed: DC – 20 MHz clock input DC – 200 ns instruction cycle

- Up to 8K x 14 words of Flash Program Memory, Up to 368 x 8 bytes of Data Memory (RAM), Up to 256 x 8 bytes of EEPROM Data Memory
- Pin out compatible to other 28-pin or 40/44-pin
- PIC16CXXX and PIC16FXXX microcontrollers

Peripheral Features:

- Timer0: 8-bit timer/counter with 8-bit prescaler
- Timer1: 16-bit timer/counter with prescaler, can be incremented during Sleep via external crystal/clock
- Timer2: 8-bit timer/counter with 8-bit period register, prescaler and postscaler
 - Two Capture, Compare, PWM modules
 - Capture is 16-bit, max. resolution is 12.5 ns
 - Compare is 16-bit, max. resolution is 200 ns
- PWM max. resolution is 10-bit
- Synchronous Serial Port (SSP) with SPI™ (Master mode) and I2C™ (Master/Slave)
- Universal Synchronous Asynchronous Receiver Transmitter (USART/SCI) with 9-bit address detection
- Parallel Slave Port (PSP) – 8 bits wide with external RD, WR and CS controls (40/44-pin only)
- Brown-out detection circuitry for Brown-out Reset (BOR)

Analog Features:

- 10-bit, up to 8-channel Analog-to-Digital Converter (A/D)
- Brown-out Reset (BOR)
- Analog Comparator module with:
 - Two analog comparators
 - Programmable on-chip voltage reference (VREF) module
 - Programmable input multiplexing from device inputs and internal voltage reference
 - Comparator outputs are externally accessible

Special Microcontroller Features:

- 100,000 erase/write cycle Enhanced Flash program memory typical
- 1,000,000 erase/write cycle Data EEPROM memory typical
- Data EEPROM Retention > 40 years
- Self-reprogrammable under software control
- In-Circuit Serial Programming™ (ICSP™) via two pins
- Single-supply 5V In-Circuit Serial Programming
- Watchdog Timer (WDT) with its own on-chip RC oscillator for reliable operation
- Programmable code protection
- Power saving Sleep mode
- Selectable oscillator options
- In-Circuit Debug (ICD) via two pins

CMOS Technology:

- Low-power, high-speed Flash/EEPROM technology
- Fully static design
- Wide operating voltage range (2.0V to 5.5V)
- Commercial and Industrial temperature ranges
- Low-power consumption

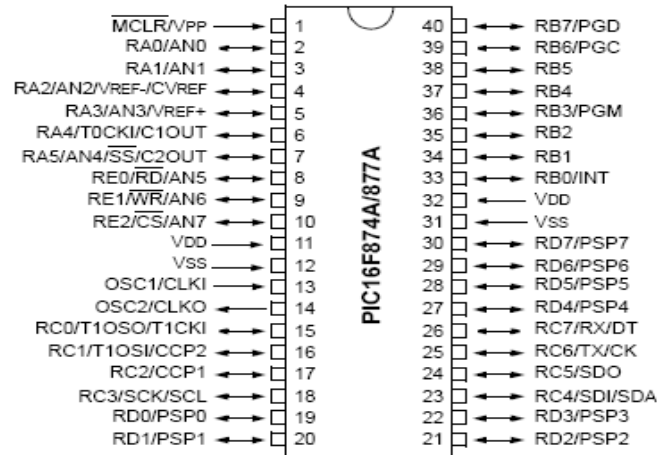


Fig.5 Pin out Diagram of PIC:

V SYSTEM SOFTWARE

Fig. 6 running of software in Laptop

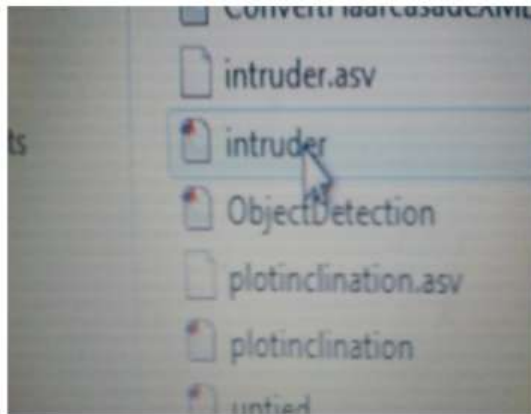


Fig.7 MATLAB Screen opened



Using MATLAB Open CV the images of the persons who are the relatives, family members neighbours all persons images are priory saved when the entry of the person into the house matched with the saved image if it matched the voice sensor announces the person is Authorized otherwise said Unauthorized, For PIC Microcontroller Embedded system programs were developed and checked the performance of the circuit. Fig 8 and Fig.9 and Fig.10 show the dialog box opening in our laptop and display of result in our proposed model kit which was we designed.

Fig.8 dialog box opened in Lap





Fig.9 Displayed output for Un-Authorized entry



Fig.10 Displayed output for Authorized entry

```
Program:
#include <htc.h>
#include<string.h>
#define ldata PORTD
#define rs RE2
#define rw RE1
#define en RE0
voidLcdinit();
voidLcddisplay(unsigned char value[]);
voidlcddata(unsigned char value);
voidLcdcmd(unsigned char value);
void send(const unsigned char *disp);
voiddataa( const unsigned char *gsm);
voidtxs(unsigned char val);
void delay();
void Delay();
void delay1();
void delay()
{
int i;
for(i=0;i<10000;i++);
}
void delay1()
{
int i;
for(i=0;i<30;i++);
}
voidLcdinit()
{
Lcdcmd(0x38);
delay();
delay();
```

```
delay();
delay();
Lcdcmd(0x38);
delay();
delay();
delay();
delay();
Lcdcmd(0x38);
delay();
delay();
delay();
delay();
Lcdcmd(0x01);
delay();
Lcdcmd(0x02);
delay();
Lcdcmd(0x08);
delay();
Lcdcmd(0x0c);
delay();
Lcdcmd(0x06);
delay();
Lcdcmd(0x80);
delay();
}
voidLcdcmd(unsigned char value)
{
ldata=value;
rs=0;
rw=0;
en=1;
delay1();en=0;
return;
}
voidlcddata(unsigned char value)
{
ldata=value;
rs=1;
rw=0;
en=1;
delay1();
en=0;
}
void send(const unsigned char *disp)
{
int x;
for(x=0;disp[x]!='\0';x++)
{
txs(disp[x]);
}
}
voiddataa( const unsigned char *gsm)
{
int d1;
for(d1=0;gsm[d1]!='\0';d1++)
{
lcddata(gsm[d1]);
}
}
```

```
voidtxs(unsigned char val)
{
int i;
while(!TXIF)
continue;
TXREG=val;
for(i=0;i<1000;i++);
}
void delay2()
{
long i;
for(i=0;i<50000;i++);
}
unsigned char rxs(void)
{
int c=0;
while(!RCIF)
{
c++;
if(c>5000)
break;
}
return RCREG;
}
unsigned char val[6],flagx=0,val1[90];
int j=0;
int x;
int sp,sp1,spt;
voidrxmo()
{
char i;
unsignedint c=0;
txs('A');txs('T');txs('+');txs('C');txs('M');txs('G');
txs('R');txs('=');txs('1');txs(13); txs(10);
for(i=0;i<90;i++)
{
while(!RCIF)
{
c++;
if(c>65000)
break;
}
val1[i]=RCREG;
RCIF=0;
CREN=0;
//for(x=0;x<10;x++);
CREN=1;
}
}
voidsms()
{
txs('A');txs('T');txs('+');txs('C');txs('M');txs('G');
txs('S');txs('=');txs("");
txs('8');txs('5');txs('3');txs('1');
txs('0');txs('6');txs('6');txs('0');txs('4');txs('7');
txs("");
txs(13); txs(10);
Delay();
Delay();
```



```
send("Un-Authorized Entry Alert");
delay(10000);
txs(26);
Delay();
Delay();
}
unsignedint d=0,e=0,f=0,flgg=0;
unsignedint m=0;
void Delay()
{
long i;
for(i=0;i<20000;i++)
{
}
}
voidsendtx(unsigned char val[],unsigned char length)
{
int i;
for(i=0;i<length;i++)
{
txs(val[i]);
}
}
/* Sample code to set up the A2D module */
void init_a2d(void){
  ADCON0=0; // select Fosc/2
  ADCON1=2; // select left justify result. A/D port configuration 0
  ADON=1; // turn on the A2D conversion module
}
/* Return an 8 bit result */
unsigned char read_a2d(unsigned char channel){
channel&=0x07; // truncate channel to 3 bits
  ADCON0&=0xC5; // clear current channel select
  ADCON0|=(channel<<3); // apply the new channel select
  ADGO=1; // initiate conversion on the selected channel
while(ADGO)continue;
return(ADRESH); // return 8 MSB of the result
}
void main() //Main entry
{
unsigned char temp,ecg,dat;
intm,op=0;
CMCON=0x07;
RCSTA=0x90; // receive enabling with the same speed
TXSTA =(0x24); // High speed selection baud rate 9600
SPBRG = 64;
CVRCON=0x00;
TRISD=0x00;
TRISE=0x00;
txs('A');txs('T');txs('+');txs('I');txs('F');txs('C');
txs('=');txs('0');txs(',')txs('0');txs(13);
txs('A');txs('T');txs(13); txs(10);
txs('A');txs('T');txs('+');txs('C');txs('M');txs('G');
txs('F');txs('=');txs('1');txs(13); txs(10);
Delay();
Delay();
RBPUE=0;
Lcdinit();
init_a2d();
```

```
TRISC1=1;
TRISC2=0;
  TRISB3=0;
TRISC0=0;
TRISB4=0;
TRISB0=0;
Delay();
RC0=0;
RC2=1;
RB3=1;
  RB4=1;
Lcdcmd(0x80);
dataa(" Security System  ");
//RB3=0;
//RB4=1;
//RB0=0;
//delay();
//
//delay();
//RB0=1;
//sms();
Delay();
Delay();
Delay();
RB3=0;
while(1)
{
  while(!RCIF)
  {
    if(op==1)
    {
      Lcdcmd(0x80);
      dataa(" Authorized  ");
      Lcdcmd(0xc0);
      dataa(" Welcome  ");
      RB3=1;
      RB4=0;
      RB0=0;
      delay();
      delay();
      RB0=1;
      RB3=1;
      RB4=1;
      delay();
      delay();
      while(!RCIF);
    }
    if(op==2)
    {
      Lcdcmd(0x80);
      dataa(" Un-Authorized  ");
      if(RC1==1)
      {
        Lcdcmd(0xc0);
        dataa("Vib Detected  ");
        RC0=1;
        RB3=0;
        RB4=1;
        RB0=0;
```

```
delay();
delay();
RB0=1;
RB3=1;
RB4=1;
delay();
delay();
sms();
Delay();
Delay();
Delay();
}
else
{
Lcdcmd(0xc0);
dataa(" Illegal Entry ");
RC0=0;
RC3=1;
}
}
}
dat=RCREG;
Lcdcmd(0xcf);
lcddata(dat);
if(dat=='A')
{
op=1;
}
if(dat=='B')
{
op=2;
}
//else
//{
//op=0;
//}
}
```

VI CONCLUSION

Self-dependence and alert system for individuals is help to avoid the crimes when they stay in alone. By using this system whenever there is a threat to the disable person then he/she has to be saved by the voice sensors by communicating the alert information. GPS, GPRS, a web camera is attached to the equipment and captures the image and sent SMS to the particular registered mobile number and using further evidence about the crime which may be happened. so the life saved.

The Unauthorized person detection circuit is designed and its operations were verified that is when a disable stay inside a house alone their family members went away due to critical work this device prevent the life of the disable like image processing method, here the disabled relation family members photos are saved when their entry to the house it matched and open the door otherwise if the photo not matched voice sensors tell Unauthorized entry and monitoring the new person entry if the new one vulgarly break the door the vibration sensor activated and with high force keep the door closed and send SMS alert to the relatives, police station etc.

REFERENCES:

- [1]. D. Suvarna Kumara , D. Narender Singh “Self Depence and Alert System for Individuals” International Journal of Engineering Development and Research (www.ijedr.org), 2014 IJEDR | Volume 2, Issue 1 | ISSN: 2321-9939
- [2]. Hasan, K. S., Rahman, M., Haque, L. A., Rahman M. A., Rahman, T. and Rasheed, M. M., (2009), —Cost Effective GPSGPRS Based Object Tracking System, I Proceedings Of International Multiconference of Engineers and Computer Scientists, March 2009, Vol-I.
- [3]. Yuan, G., Zhang, Z. and Wei Shang Guan (2008), —Research and Design of GIS in Vehicle Monitoring System, I IEEE International on Internet Computing in Science and Engineering

- [4]. Aloquili, O., Elbanna, A. and Al-Azizi, A., —Automatic Vehicle Location Tracking System Based on GIS Environment, IET Software, 2009, 3.4, pp. 255-263.
- [5]. Michael, K., Mcnamee, A., Michael, M. G. and Tootell, H., (2006), —Location-Based Intelligence-Modeling Behavior in Humans Using GPS, Proceedings of IEEE.

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