DESIGN OF VIDEO MANAGEMENT SYSTEM FOR FORENSICS AND LIBRARIES

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ABSTRACT

Nowadays, security is the main issue in any fields, especially in banks, Libraries, ATM s, colleges, offices, construction areas, shopping malls, open air meetings, apartments. So in order to overcome problems and saving manpower, design of video management system is used. By this video management system, we can detect the unknown persons to enter and give full security .video management system consists of a PIR sensors, ATMEGA 644controller, buzzer, camera PIR. We use the sensor to detect the person.PIR sensor has an excellent performance infrared sensor for use in alarm burglar systems, visitor presence monitoring, light switches and robots. The device operates between 2.7-5.5 volts. When you add Video Management Software to a computer you create a Network Video Recorder System (NVR) These NVR products are Windows based applications that manage and record the video from networked IP cameras. There are wires that connect to an electrical source and a button when that button is pressed the buzzer will make a sound. Buzzer to rated voltage and running under normal working conditions, its consideration of that portion of the burden of the highest voltage.

INTRODUCTION

In today's times, it is very unfortunate, that we could possibly become the victim of a crime. And given the current state of the economy, a lot of people turn to crime as the easy way out of survival and start committing a lot of crime and that's when the catch of why we need security comes in, it's very funny but a fact too. The fortunate part is security systems being introduced and are being implemented for protection of yourself and your family. So if you ever consider installing security be it your home or work premises, then you have reached the right article to read.

Security is the degree of protection against danger, damage, loss, and crime Security as a form of protection are structures and processes that provide or improve security as a condition. Security has to be compared to related concepts: safety, continuity, reliability. The key difference between security and reliability is that security must take into account the actions of people attempting to cause destruction. With respect to classified matter, the condition that prevents unauthorized persons from having access to official information that is safeguarded in the interests of national security.

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See also national security. More and more businesses, financial institutions, media organizations and even hospitals are securing their premises and facilities with video analytics to ensure a safer environment for all. Rather than relying on basic surveillance infrastructure, video analytics solutions can respond to the varied needs of such organizations, including awareness of perimeter and other security breaches, protection of physical and intellectual property, post-event analysis and understanding of safety risks. Restricted Area Protection allows cameras to monitor service lanes and other restricted areas for unauthorized traffic and instantly alert the operator these events. Any activity Specially Protected Area not authorized by the plan of management relating to that site is prohibited. Any person who enters a protected area is required to provide a site visit report.

Security is no longer related only with protecting the territory of a state (national sovereignty), but also includes efforts to ensure, fulfil and protect the security of citizens (human). The use and need of security cameras in today's world is rapidly increasing each and every day. It is sad that with what we like to think is a civilized race; we may become a victim of a crime at any moment. With the rough economic times, many people turn to crime as a means of surviving which is where why we need security cameras comes into play.

Not only can it alert you, your neighbours or local police officers of a crime but it can even catch the person doing it or even deter them from every doing it in the first place. A home that is protected by a security system is far less appealing to a criminal. Being alert at your home or office is also helpful and a security system allows you to know what is going on at all times. This allows you to avoid unwanted accidents as well as burglaries and can also end up saving you and your family a lot of trouble and money.

Many security systems are very user friendly. You need to make sure you consider the features of your security system as well as the equipment and accessories that come along with it. A back-up power supply is also very helpful. A burglar will most likely cut the power to your house first so making sure your security system stays running with the power cut is extremely important. Security systems are some of the best weapons a home owner has against a burglary or a business owner has against theft. So make sure that if you feel unsafe at your home or office that you get a proper security system for protection as soon as possible for safety in the world. It does protect our data centre, other servers in our network, or a malicious user with physical access. The basic security system means you don't leave any of your doors or windows unlocked or open. What many people don't seem to understand is that being a victim of a crime costs you a lot of money. More money, say, and then it would take to install a security camera system. A proper security system can assist you in more than one way.

AIM OF THE PROJECT

The main aim of the project is to secure the restricted area. It captures the image of the person who is entering into the restricted area. When a person enter into the restricted area the buzzer alarms to indicate the danger and the camera captures the image of the person entering the restricted area. Senses the signal of the human beings by using PIR sensor module and according to the signal the buzzer alert is given and also the camera captures the image

METHODOLOGY

Exploiting a programmable microcontroller draws the approach to this project. The microcontroller used is the ATMEGA32, Along with the PIR sensor, camera, and buzzer. For carrying out this project we implemented it in two stages: software and the hardware initiations. In the software stage we write the program in embedded C and dump it in the microcontroller to get the right outputs. In hardware phase we designed the circuit diagram and implemented the layout on a circuit board. The PIR sensor senses the disturbances' in its field of view   and sends it to the ATMEGA32 after detecting the signal the buzzer alarms and camera captures.

SIGNIFICANCE

This system is designed to stop crimes and to secure the restricted area. It is well suited for research centres where the person is not allowed to enter the restricted area. The main advantage of this project is that the image of the criminal is obtained to know the crime as soon as possible. This project can also be elaborated by using the GSM where the information will be automatically send to the police.

ORGANIZATION OF WORK

ATMEGA32 gives the detailed hardware description of the microcontroller. Block diagram gives the description of the hardware of the project. It includes detailed circuit description. Next deals with the software part of the project

BLOCK DIAGRAM
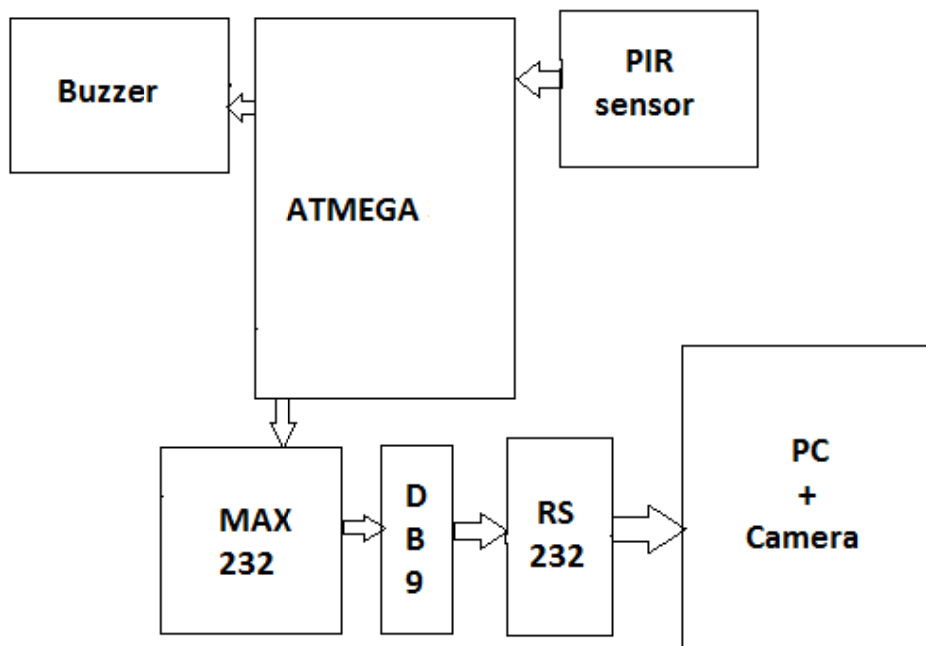
Video management system consists of a PIR sensors, ATMEGA 644controller, buzzer, camera PIR. PIR sensor has an excellent performance infrared sensor for use in alarm burglar systems, visitor presence monitoring, light switches and robots. PIR sensor sends signal to the microcontroller. Microcontroller sends the signal to the camera, and then it performs the

monitoring operation. When the PIR signal is high then buzzer sounds and the camera captures the picture of signal. Max232 is connected to the controller and the DB9 is connected to Max232. RS232 is a cable which is connected to the DB9 and the pc in which lab view software is installed. Camera is connected to the pc along with the installed drives in it. When the signal is detected microcontroller gives the signal and buzzer sounds and the camera captures.

LABVIEW

LABVIEW (short for Laboratory Virtual Instrumentation Engineering Workbench) is a system design platform and development environment for a visual programming language from National Instruments

INTERFACING

A key benefit of LABVIEW over other development environments is the extensive support for accessing instrumentation hardware. Drivers and abstraction layers for many different types of instruments and buses are included or are available for inclusion. These present themselves as graphical nodes. The abstraction layers offer standard software interfaces to communicate with hardware devices. The provided driver interfaces save program development time. The sales pitch of National Instruments is, therefore, that even people with limited coding experience can write programs and deploy test solutions in a reduced time frame when compared to more conventional or competing systems. A new hardware driver topology (DAQmxBase), which consists mainly of G-coded components with only a few register calls through NI Measurement Hardware DDK (Driver Development Kit) functions, provides platform independent hardware access to numerous data acquisition and instrumentation devices. The DAQmxBase driver is available for LABVIEW on Windows, Mac OS X and Linux platforms.

Although not a .NET language, LABVIEW also offers an interface to .NET Framework assemblies, which makes it possible to use, for instance, databases and XML files in automation projects.

CODE COMPILATION

In terms of performance, LABVIEW includes a compiler that produces native code for the CPU platform. The graphical code is translated into executable machine code by interpreting the syntax and by compilation. The LABVIEW syntax is strictly enforced during the editing process and compiled into the executable machine code when requested to run or upon saving. In the latter case, the executable and the source code are merged into a single file. The executable runs with the help of the LABVIEW run-time engine, which contains some precompiled code to perform common tasks that are defined by the G language. The run-time engine reduces compile time and also provides a consistent interface to various operating systems, graphic systems, hardware components, etc. The run-time environment makes the code portable across platforms. Generally, LABVIEW code can be slower than equivalent compiled C code, although the differences often lie more with program optimization than inherent execution speed.

LARGE LIBRARIES

Many libraries with a large number of functions for data acquisition, signal generation, mathematics, statistics, signal conditioning, analysis, etc., along with numerous graphical interface elements are provided in several LABVIEW package options. The number of advanced mathematic blocks for functions such as integration, filters, and other specialized capabilities usually associated with data capture from hardware sensors is immense. In addition, LABVIEW includes a text-based programming component called math script with additional functionality for signal processing, analysis and mathematics. Math Script can be integrated with graphical programming using "script nodes" and uses a syntax that is generally compatible with MATLAB

CODE RE-USE

The fully modular character of LABVIEW code allows code reuse without modifications: as long as the data types of input and output are consistent, two subs VIs are interchangeable. The LABVIEW Professional Development System allows creating stand-alone executables and the resultant executable can be distributed an unlimited number of times. The run-time engine and its libraries can be provided freely along with the executable.

A benefit of the LABVIEW environment is the platform independent nature of the G code, which is (with the exception of a few platform-specific functions) portable between the different LABVIEW systems for different operating systems (Windows, Mac OS X and Linux). National Instruments is increasingly focusing on the capability of deploying LABVIEW code onto an increasing number of targets including devices like Phar Lap or Vx Works OS based LABVIEW Real-Time controllers, FPGAs, Pocket PCs, PDAs, Wireless sensor network nodes, and even Lego Mind storms NXT

USER COMMUNITY

There is a low-cost LABVIEW Student Edition aimed at educational institutions for learning purposes. There is also an active community of LABVIEW users who communicate through several e-mail groups and Internet forums
.
LICENSING

Building a stand-alone application with LABVIEW requires the Application Builder component which is included with the Professional Development System but requires a separate purchase if using the Base Package or Full Development System. There is no LABVIEW 2011 student license for Linux.

RUNTIME ENVIRONMENT

Compiled executables produced by all newer versions of the Application Builder (since version 6.0) are not truly standalone in that they also require that the LABVIEW run-time engine be installed on any target computer on which users run the application. The use of standard controls requires a runtime library for any language and all major operating system suppliers supply the required libraries for common languages such as C. However, the runtime required for LABVIEW is not supplied with any operating system and is required to be specifically installed by the administrator or user. This requirement can cause problems if

an application is distributed to a user who may be prepared to run the application but does not have the inclination or permission to install additional files on the host system prior to running the executable.

FORMAL TESTING

For an environment targeted for repetitive application, especially in process automation, LABVIEW includes no built-in functions for formally testing limits, reading a limits file, and conveniently tracking the passing or failing results.Due to such constraints in effect with formal and dynamic testing, the recommended usage potentially will not cover the required scope for production or therapy processes, especially when these are subject of risk and security auditing,

AVR STUDIO 5

AVR Studio is an Integrated Development Environment for writing and debugging AVR applications in Windows® 98/XP/ME/2000 and Windows NT® environments. AVR Studio provides a project management tool, source file editor and chip simulator. It also interfaces with In-Circuit Emulators and development boards available for the AVR 8-bit RISC family of microcontrollers.

Open the AVR studio 5.0. From the menu bar, select file and open new project window. Give the file name, select the file location, and click OK
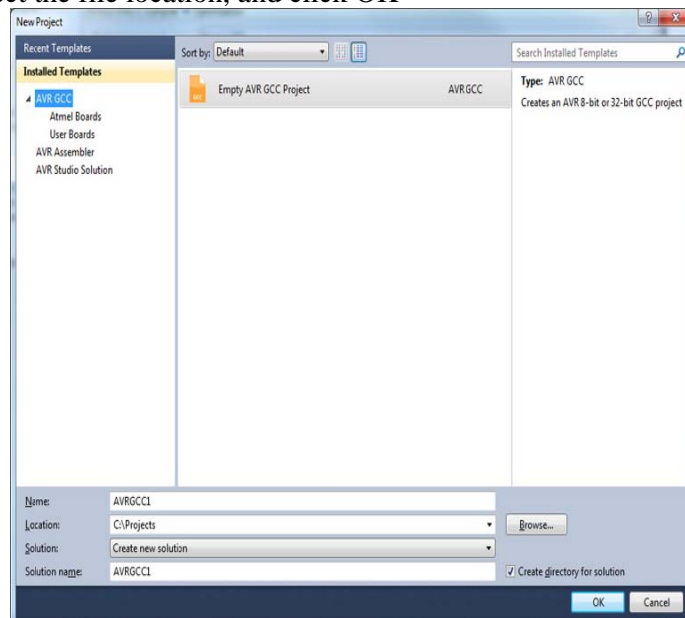

A "device selection" dialog box appears, choose a microcontroller, and click OK. This is to select any of the micro controllers we like to choose for the implementing of the coding.
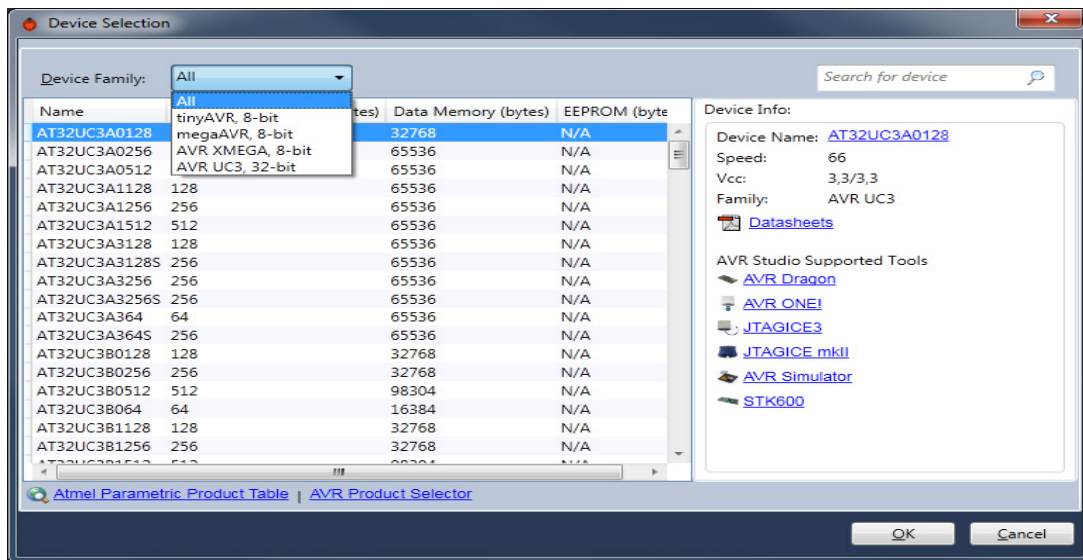
From the menu bar, select project, go to "file name properties "We get a file, from that click on generate files, click on ".hex" , ".map", ".iss"," .eep" files. Go to tool chain in that file, from the drop down box, select optimization. Select optimization level as "optimize for size (_os)" Save changes.
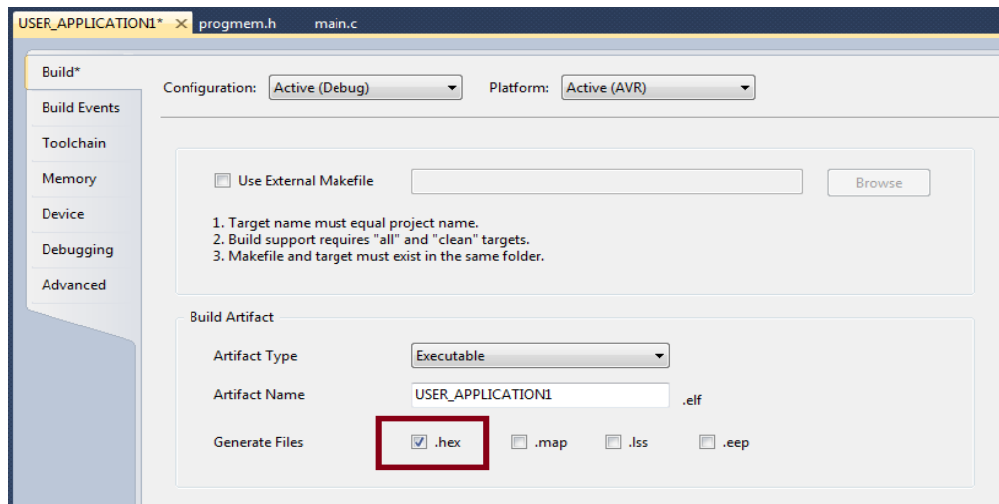

Write the code, save the file. Build (F7) until the program is succeeded. Error list will be given at the bottom. Check the errors and build the program until the program is succeeded.
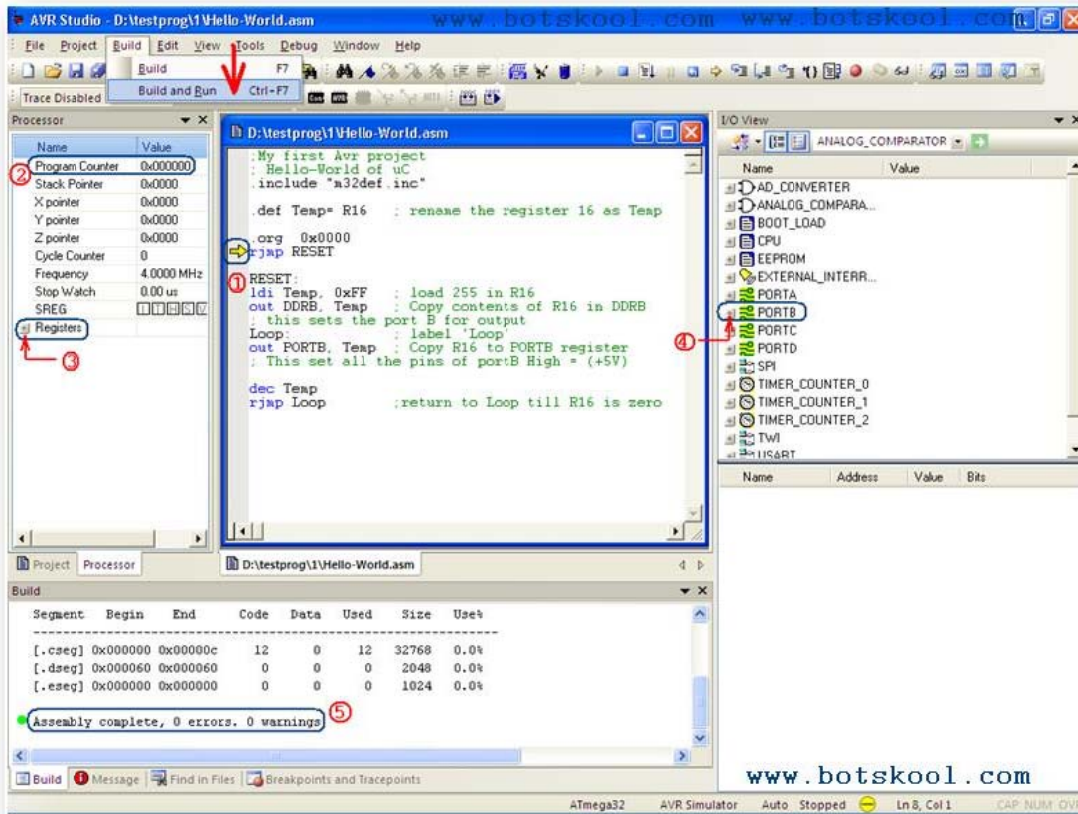
AVR is an integrated Development Environment for Writing, Compiling and Debugging Software. It is Fully Symbolic Source-level Debugger. It contains Configurable Memory Views, Including SRAM, EEPROM, Flash, Registers, and I/Os. Unlimited Number of Break Points is present. Trace Buffer and Trigger Control. Simulator Port Activity Logging and Pin Input Stimuli. File Parser Support for COFF, UBROF6, UBROF8, and Hex Files. Support for C, Pascal, BASIC and Assembly Languages

KICAD

Kicad is open source (GPL) software for the creation of electronic schematic diagrams and printed circuit board artwork. This project was started by Jean-Pierre Charras, a researcher at GIPSA-LAB and a teacher in IUT de Saint Martin d'Hères. (France), in the field of electrical engineering. It is now mature and very actively supported by a team of developers and a user group. This team counts 3 main developers and a dozen regular contributors.
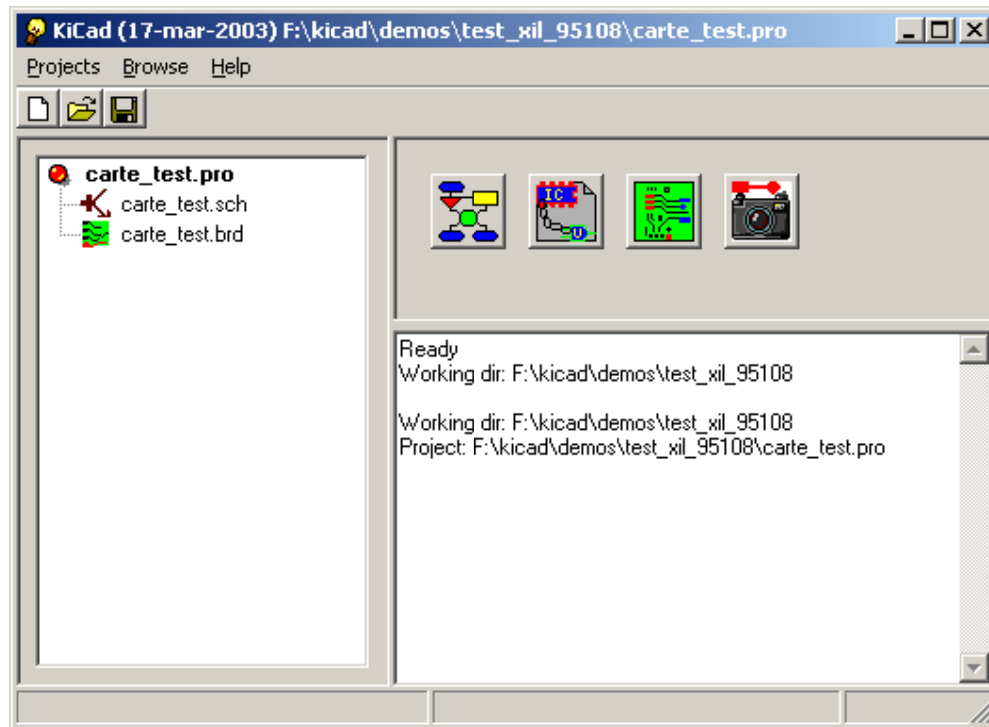
KICAD is software which includes a project manager and four tools:

- **Eeschema**: Schematic entry.
- **Pcbnew**: Board editor.
- **Gerbview**: GERBER viewer (photo-plotter documents).
- **Cvpcb**: footprint selector for components used in the circuit design.

EESCHEMA:

1. Open KICAD EESCHEMA (schematic editor)
2. From the left side menu, select "place a component" and "place a wire" etc
3. Prepare the circuit with the required components
4. Go for annotation and give the specific value to the components
5. From the toolbar, select PCB ERC check
6. Save the current schematic as ".sch" file
7. Go for Net list generation, save the file as ".net file"
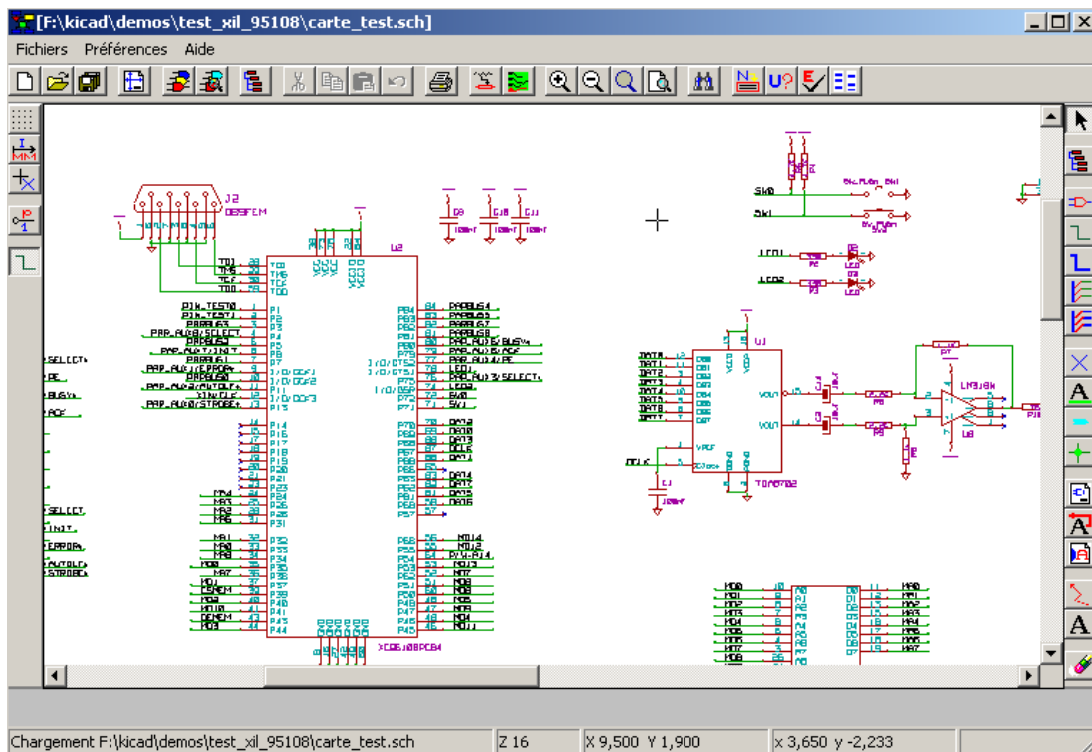
CVPCB:

1. Open CVPCB (components to modules)
2. From the toolbar, select file for opening of our required file
3. There will be appearance of component list, select "display full footprint" from the toolbar
4. Give the dimensions according to the components
5. Save the file as ".net" file
6. Click OK
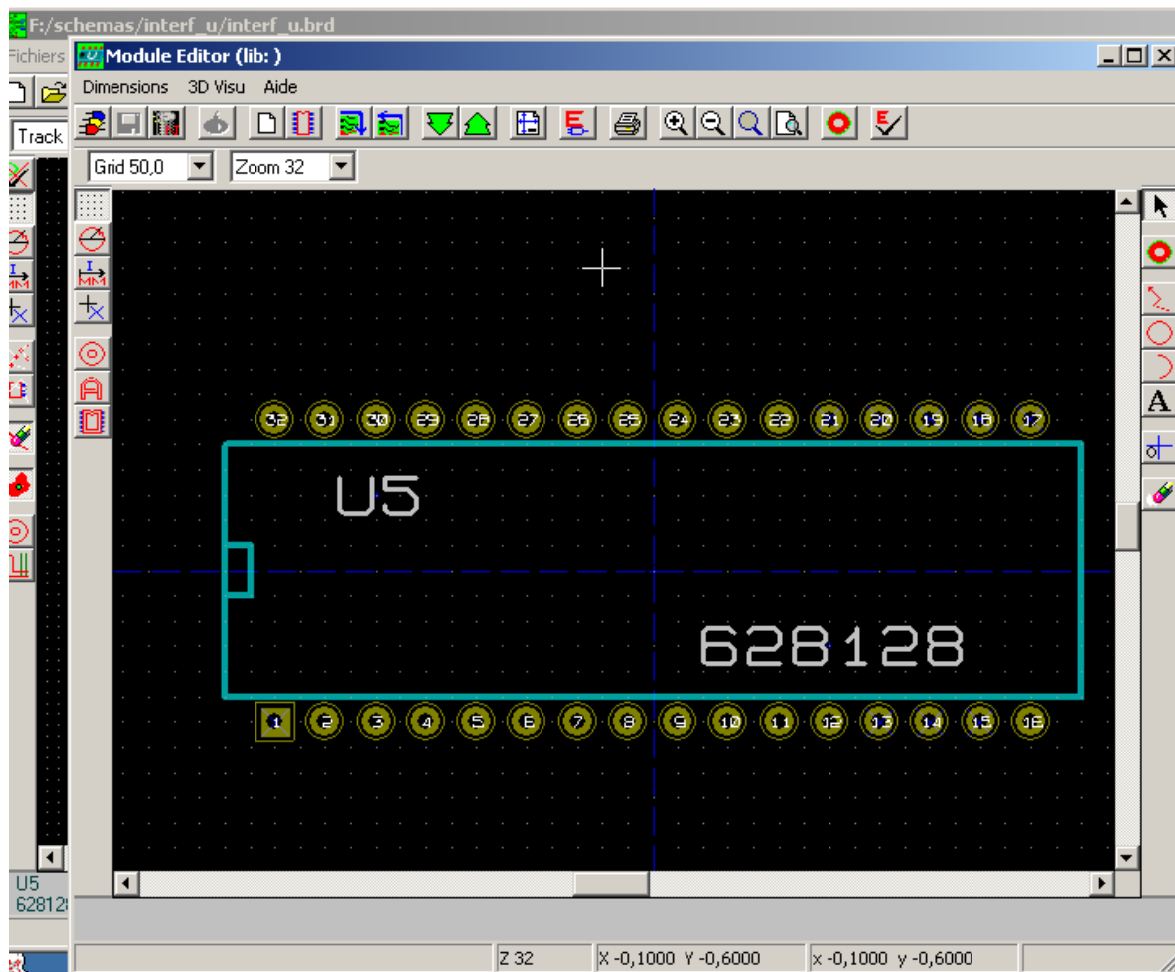
PCBNEW:

1. Open PCB New(PCB editor)
2. From the toolbar, select "read net list", we get "net list dialog box"
3. From the dialog box, select browse and choose our require file
4. Click on "read current net list", close the dialog box
5. We get all the required components in a group, separate each component
6. From left menu, select "show board radsnest", we have circuit connection between the components
7. Arrange the components in such a way that there will be no overlapping of circuit connections
8. Select from the menu bar, select "back view(pg<dn>)"
9. Select "get traces", we have to draw the final connections
10. From menu bar, select "PCB Edges", select "add graphic line" ,to draw the outline for the circuit board
11. Save the file as ".brd" file
12. In order to see our board file in a real view, then go for 3D view

PROTEUS

ISIS provides the development environment for PROTEUS VSM, our revolutionary interactive system level simulator. This product combines mixed mode circuit simulation, ISIS micro-processor models and interactive component models to allow the simulation of complete micro-controller based designs. ISIS provides the means to enter the design in the first place, the architecture for real time interactive simulation and a system for managing the source and object code associated with each project. In addition, a number of graph objects can be placed on the schematic to enable conventional time, frequency and swept variable simulation to be performed.

1. Open proteus 7.6 SP0 version
2. Go to "pick from libraries(p)",type the device name, click OK
3. Draw the circuit with required components
4. Save the file
5. In order to dump the code in the microcontroller, click on microcontroller, edit properties, select the ".hex" file, select the frequency, click Ok
6. Next run the program, we will able to see the output in proteus.
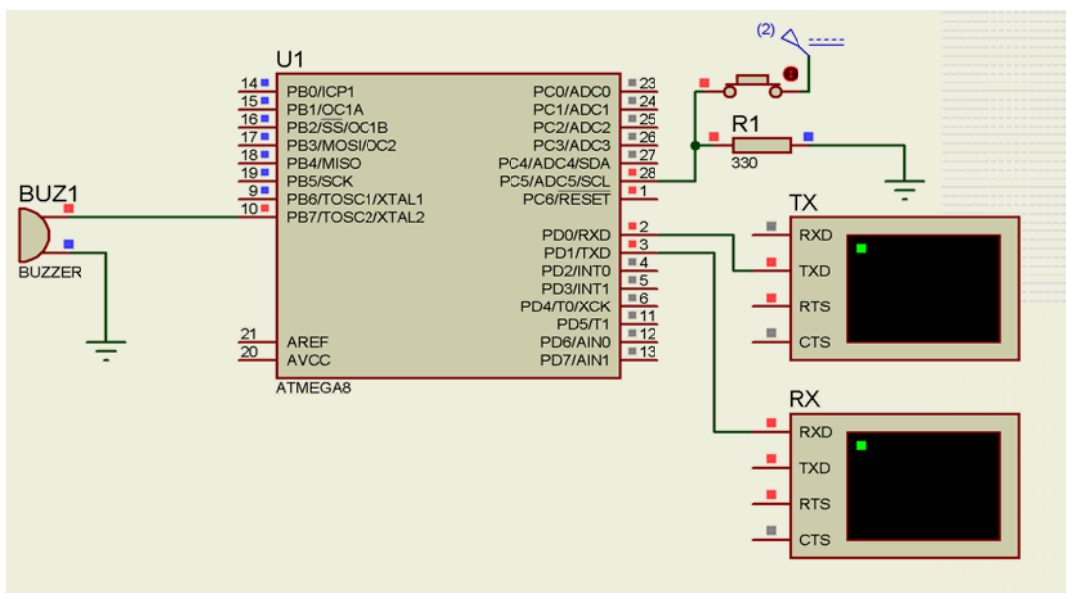
CIRCUIT DIAGRAM
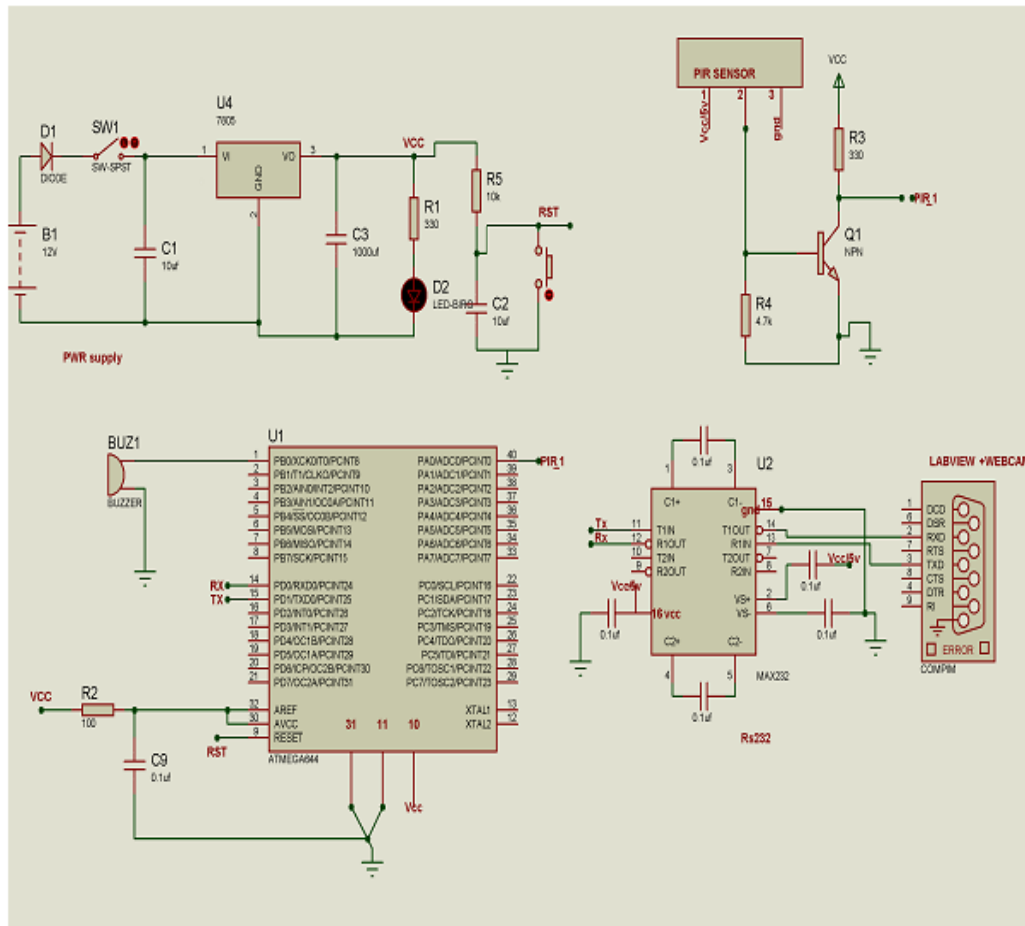
WORKING

The major components in our project are the microcontroller, PIR sensor, buzzer, camera, and other components are MAX232 IC, DB9 connector, RS232 cable. This project is implemented in highly restricted areas. PIR sensor will sense the persons who are entering into the specific area. It will give the output as logic high and logic low. The PIR Sensor has a range of approximately 20 feet. It can sense the person only who are within 20 feet. They are often referred to as PIR, "Passive Infrared", "and Pyro electric".

PIR sensors allow you to sense motion, almost always used to detect whether a human has moved in or out of the sensors range. Easy to use PIR Sensor Module for human body detection. Incorporating a Fresnel lens and motion detection IC. This can vary with environmental conditions. We dumped the code into the microcontroller in such a way that whenever the PIR sensor senses the person, it will give the output as logic high.

When the PIR output is high then microcontroller sends the signal. Then buzzer will be in ON condition, and the camera starts working an then it captures the image of the person. When no one is present in the area then PIR output is low and buzzer will be in OFF condition. Camera has the ability to record the situation till some minutes but in this project

we are just capturing the image because the alert of the buzzer have given to it. When the buzzer is on then we will come to know that someone has been entered the hall. But if atoll we do not concentrate on the buzzer then the camera is used. It captures the criminal image.

Video management system for forensics is the system which is more advantageous an which reduces the human efforts. It can help in catching criminals. It deters people from committing crimes. It allows the people to see how a crime was committed. We can further implement the system by using GSM. If we include GSM it automatically gives the information to the police after the detection of the human signal.

CODING

```
#include <avr/io.h>
#include <util/delay.h>
Void _usart_init(void)
{

        UBRRL=0X33;
        UCSRC=(1<<URSEL)|(3<<UCSZ0);
        UCSRB=(1<<RXEN)|(1<<TXEN);
}
Unsigned int _usart_tx(data)
{
        UDR=data;
        While (!(UCSRA &(1<<TXC)));
        UCSRA|=1<<TXC;
}
Unsigned char _usart_rx()
{
        While (!(UCSRA & (1<<RXC)));
        UCSRA=(0<<RXC);
        return (UDR);
}
int main (void)
{
        DDRC=0X00;
        DDRB=0XFF;
        Unsigned char X="A";
        _usart_init ();

                While (1)
        {

                if ((PINC & 0X20)==0X20)
                {
                        PORTB=0X80;
                        _delay_ms (2000);
                        _usart_tx ('A');
                        _delay_ms(1000);
```

```
            }
            else if((PINC & 0X02)==0X00)
            {
                    PORTB=0X00;
                    _delay_ms (1000);

                    _usart_tx ('B');
            }


        }
}
```

ADVANTAGES

- It can help in identifying criminals.
- It deters people from committing crimes.
- It allows the people to see how a crime was committed.
- Does not require any human efforts.
- Cost is low.

DISADVANTAGES

- It can detect the person but cannot count the number of persons entering.
- Cameras may get stolen or damaged.
- Requires ongoing maintenance

APPLICATIONS
- ATM's.
- Libraries
- research centers.
- shopping malls.
- Home security system
- Bank lockers

FUTURE SCOPE

We can further implement the system by using GSM. If we include GSM it automatically gives the information to the police after the detection of the human in the restricted area.

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