INTELLIGENT WIRELESS VIDEO MONITORING SYSTEM USING COMPUTER

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Abstract- The present wireless video monitoring system described in this paper is designed using wireless video monitoring system, to detect the presence of a person who is inside the restricted area. This type of automatic wireless video monitors is quite suitable for the isolated restricted zones, where the high security is required. On the earlier time much importance is not given for the security system. As we see today lot of terrorism has grown up across the country and need has arosed to develop different types of security systems for various applications to safe guard the zones of various types like, military zones, railway yards, borders etc., this kind of automatic video monitoring systems can be installed at borders, where the terrorists are crossing borders. Our country is spending lot of its revenue to safe guard the borders. Installing this type of security systems everywhere at critical points lot of revenue can be saved by minimizing the manpower.

Keywords- Robotic Action, Surveillance, Sensing Circuit, Transmitter

I. INTRODUCTION

The principle of remote sensing is utilized in this project, to detect the presence of any person who is very near to reference point within the zone. A video camera collects the images from the reference points and then converts into electronic signals. The images which are collected are converted from visible light into invisible electronic signals inside a solid-state imager. These electronic signals are transmitted to the monitor. Here for the demonstration purpose three reference points is taken. Each reference point is arranged with two infrared LED’s and one lamp. Arrangement is made to detect the presence of a person who is near the reference point. Reference point is nothing but restricted zone. When any person comes near to any reference point i.e. restricted zone, then immediately that particular reference point output will become high, this high signal is fed to the computer and the computer energizes that particular reference point lamp and rotates the video camera towards that reference point for collecting the images at that particular reference zone. To rotate the video camera towards interrupted reference zone, stepper motor is used.

II. PROPOSED SYSTEM

The video surveillance unit is designed for the portability and widest possible viewing range. The unit consists of a Stepper motor, which drives the camera towards reference points automatically by the computer and a transmitter transmits the images collected by the camera to a distant end. Thus an automatic controlled wireless camera is very useful for surveillance of places where the particular location makes it inconvenient or impractical for a wired operation of the system.

The robotic action made by the stepper motor is attached to the camera allows surveillance of maximum area with one single camera. There are several types of security systems existed in the Market; one of the most common security systems is CCTV (Closed Circuit Television). The CCTV consists of Video Surveillance Camera used as security-monitoring device plays a major role in security. One reason for this is the fact that a picture is worth then a thousand words. Especially this is true in a court of law where an eyewitness is required who can place the criminal at the scene of a crime. Here the Infrared sensing circuit consists of two infrared LED’s for transmitting the signal as well as receiving the signals.

The signal transmitted by the transmitting LED omits the signal in a line like laser beam; the radiated signal from the transmitting LED is invisible and harmless. Whenthe human body interrupts the transmitting signal, there the signal is reflected and this reflected signal is received by the infrared receiving LED.

III. INFRARED TRANSMITTER/ RECEIVER SECTION

This section is designed for detecting the presence of a person who is inside the restricted zone within the range. This is basically an infrared proximity detection system. Here high efficiency IR-LED is driven by PNP Transistor SK100 with a modulating frequency of about 10 KHz. Frequency is available from Pin 5 of LM 567 IC (versatile PLL tone decoder IC). The 47W resistor connected in series with the IR LED limits the IR-LED current. The basic function of the detector circuit is by radiating energy into space through IR LED and detecting the echo signal reflected from an object. The energy reflected that is...
returned to the receiving LED indicates the presence of a person who is within the range. Portion of the transmitted energy is intercepted by the target and re-radiated in many directions. The radiation directed back towards the system is collected by the receiving LED causes to produce a high signal at Pin No.8 of LMS67 IC. The output of the receiver is fed to the computer. When the computer receives a high signal from the reference area, the computer drives the stepper motor through the driving transistors and rotates the motor towards that particular reference point. Similar circuits are designed for the three different reference points.

![Sensing circuit diagram](image)

**Fig (I): Sensing circuit diagram**

### IV. USE OF COMPUTER & STEPPER MOTOR

The computer is playing a major role in this system. Main function of the computer is to identify the interruption made by the person, where exactly the signal is interrupted, and at which reference point identifying the point and displays the information on the screen. Another major function of the computer is to drive the stepper motor according the signal received. This block is also responsible for identifying the reference point. Any normal configuration computer can be employed here. The software program defining the operations for the computer is written in ‘C’ language. The output of the obstacle sensor is fed to the computer through the parallel port. Original purpose of Parallel port was to enable communication between a PC and a peripheral. Other use that has become very popular is transferring information or receiving the information/instruction. In this project work the received information from the detector circuit is used to drive the motor to rotate video camera, which is useful for the system for identifying the interrupted reference zone. With the help of associated software written in ‘C’ language the received information can be displayed on computer screen. Computer reads the data received through parallel port and can store the data; the same data will be displayed on computer screen. The program contains instruction about what has to be done with the data. The CPU executes the programs stored in the main memory by performing fetch instruction from memory and right data either to a memory location or on an output device. Main components of the CPU are ALU (Arithmetic and Logic Unit), CU (Control Unit), and a set of registers. Control unit is responsible for the moment of data and instructions in and out of the memory and CPU. It is also responsible for the decoding of an instruction and determining as to what is desired by the same. Complete electronic Hardware is interfaced with parallel port. To drive the stepper motor in both the directions (clockwise or anticlockwise) the system is programmed to produce the pulses in a sequence at four different outputs, these sequential programmed outputs energizes the motor windings one after another in a sequence either from top to bottom or from bottom to top. To drive the motor in clockwise, the sequence starts from top to bottom, similarly to drive the motor in anti-clockwise the sequence starts from the bottom to top. The output of the computer through parallel port is used to drive the switching transistors; finally these switching transistors drive the stepper motor. These transistors provide the required current to energize the motor. Output of the computer is also used to drive the three relays and one buzzer. When any human body interrupts any reference zone, the computer energizes the alarm at the same time the computer energizes the corresponding relay also. These relay contacts are used to energize the three different lamps corresponds to the three reference points independently. Circuit diagram of relays and buzzer driven by the computer is shown in fig II.

![Relay and buzzer circuit diagram](image)

**Fig (II): Relay and buzzer circuit diagram**

### V. TRANSMITTER

The output of the video camera is fed to this transmitter block, for transmitting the video signals in amplitude modulation. Video signal coming out of video camera is nothing but pure composite video signal and this signal is fed to this AM transmitter. The transmitter circuit generates a continuous

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frequency of 100MHz approximately, that is used to form a permanent link between the transmitter and receiver, and this is known as carrier frequency. The output of video camera is fed to this carrier input as a modulating wave. This is a frequency modulated radio transmitter. The radiating power of the transmitter is less than 20mw, such that the range between transmitter and receiver can be less than 25 feet. The AM transmitter consists three sections namely

1. VHF Oscillator
2. Driver Stage or Modulator
3. Final Amplifier Stage.

The output of the VHF oscillator is treated as carrier and the same is fed to the modulator block. The output of the VHF oscillator is fed to collector and the final output taken from the emitter of the PNP transistor of the modulator section. Since it is a PNP transistor there won’t be any phase reversal (180 degree phase shift), because this transistor is configured in common base configuration. Therefore finally at the output of this stage, a perfect AM wave can be obtained. In the amplifier section 2 N 3866-NPN Transistor is used to amplify the input signal. The Complete Circuit Diagram of transmitter including three stages is given in fig (IV).

The carrier is designed for transmitting the picture details. At the receiving end, a small television set of 4” screen is used to display the picture caught. In this way using this wireless video camera we can detect the entry of unauthorized persons especially in case of military to detect our enemies crossing the border.

VI. FUTURE WORK

We can implement the tracking algorithms to track multiple intrusions at a time. Image database of potential attackers can be included in the system and facial recognition algorithm can be implemented to match the intruders with the information in the image database.

CONCLUSION

This system can be used as an efficient surveillance system with minimum cost. This paper presented a system design for wireless video surveillance, including video capture with automatic camera control and data transmission. Wireless camera based surveillance systems significantly contribute to situation awareness.

Such systems transform video surveillance from a data acquisition tool to information and intelligence acquisitions Systems. Real-time video analysis provides smart surveillance systems with the ability to react to an activity in real-time, thus acquiring relevant information at much higher resolution. The long-term operation of such systems provides the ability to analyze information in a spatiotemporal context.

As such systems evolve, they will be integrated both with inputs from other types of sensing devices and also with information about the space in which the system is operating, thus providing a very rich mechanism for maintaining situation awareness in areas which require high security.

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