

INDUSTRIAL ROBOT WITH IMAGE MONITORING USING CCTV

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Abstract: An embedded system is a special-purpose computer system designed to perform a dedicated function. Since the system is dedicated to specific tasks, design engineers can optimize it, reducing the size and cost of the product. Embedded system comprises of both hardware and software. Embedded technology uses PC or a controller to do the specified task and the programming is done using assembly language programming or embedded C. A robot is an apparently human automation, intelligent and obedient but impersonal machine. It is relatively, that robots have started to employ a degree of Artificial Intelligence (AI) in their work and many robots required human operators, or precise guidance throughout their missions. Slowly, robots are becoming more and more autonomous. This project presents the construction of an autonomous spy robot which has a wireless CCTV on it. The robot is capable to maneuver and scout a given particular area safely by avoiding obstructions across its path and streaming the wires video data onto a TV screen.

Keywords: Robotics, Microprocessor, Bluetooth Module

I. INTRODUCTION

Industrial automation has offered higher levels of productivity, efficiency, and quality as well as reduction to cost on the industry. In most Industries, the path towards increased productivity is through increased automation process and control. Automating using robot systems will increase productivity, efficiency and quality control. During operation, robots can be controlled to accommodate more work, and even operate beyond working hours.

With the advent of robotics, laborious and time consuming work in industrial plant and factories have made ease for workers to complete the operation. These workers are assigned to manipulate or control these robots instead of requiring them to carry the task by themselves. This control is made easy with the use of a Bluetooth device.

There is however an inevitability of worker exhaustion which can result to a decrease in the production line. This is the reason why robotics arises in industrial automation processes today. Here I am introducing the wireless communication technology, is mainly used for the movement of the robot and also by audio commands we can move this robot. Which helps to reduce the human efforts in industry and also it increase the productivity of a factory.

II. WORKING PRINCIPLE

Here in my proposed paper, it consists of the construction of an autonomous spy robot which has a wireless CCTV on it. The robot is capable to maneuver and scout a given particular area safely by avoiding obstructions across its path and streaming the wires video data onto a TV screen.

In industry during the production in an assembly line raw materials are required for its production. A wireless unmanned robot is installed in such a way that it supplies the raw material from the store to the assembly line whenever the raw materials are required. The actuation of the robot is lively controlled by the server sitting in the control room. The robot is built with a 8051 microcontroller and the program controls the travelling path of the robot in such a way that the location of the industry is predefined and also the travelling path to guide the vehicle from its loading point to the unloading point.

The server lively sends the signals to the robot of its loading section and unloading section using a wireless bluetooth module. A wireless CCTV camera is used to get the surveying location to the server sitting in the control room. If any obstructions are presented on the travelling path of the robot the PIR sensor detects the obstacles and sends the signal to the server. And after clearing the obstacle it continuous it's defined work which has been stopped.

III. ROBOTS WITH BLUETOOTH

1. The robot has to be built before to be controlled while the Bluetooth module has to be included in the project. Even you have a very big passion to build robots from scratch or to use robotic kits; the robot must be functional structurally as well as electrically.
2. In general, some robotic parts are included in almost all simple projects where little robots are controlled with Android devices. These parts are: robot structure (for example car chassis), the controller, Bluetooth module, electric motors, motor driver, and other parts like batteries, power cables, wheels, etc.
3. If you want to focus more on programming and less in electronics and mechanics, a robotic kit is the most useful and easy robot that can be controlled. Most projects including Android controlling robots uses wheeled robots. There is not a rule; you can control any type of robot using just a simple Android device.

IV. 8051 MICROPROCESSOR

We have used MCU8051 processor in our model due to its advanced features described below. We use only the keypad matrix, LCD display, UARTS, GPIO and I2C protocol. 8051 processor is a link between Bluetooth and mobile modules for communication. The description of 8051 is discussed in further sections.

- Compatible with MCS-51™ products
- 4K bytes of In-System Reprogrammable flash memory
- Fully static operation : 0 to 24MHz
- Three level program memory lock
- 128×8-bit internal RAM
- 32 programmable I/O lines
- Two 16 bit counters / timer
- Six interrupt sources
- Programmable Serial Channel
- Low-power Idle and Power down Modes

V. CCTV CAMERA

- CCTV stands for Closed Circuit TV. CCTV uses one or more video cameras to transmit video images and sometimes audio images to a monitor set of monitors or video recorder.
- Most wireless CCTV cameras use the 2.4 Gigahertz frequencies to transmit their video images to a monitor or DVR (digital video recorder). Usually, frequencies can be slightly changed to have more than one group of cameras in a specific space.
- Wireless CCTV cameras used at this frequency can easily transmit through most walls and obstacles; however each individual location will have its own operating limits.
- Expect most wireless CCTV cameras to send data to a range of about 200 feet, however many will more likely work well when transmitting less than 150 feet. A clear line of sight transmission will always work the best
- Obviously a wireless connection allows you greater freedom to place your CCTV camera almost anywhere. While wireless CCTV cameras transmit their video images to a digital video recorder or monitor, many of these types of cameras must be plugged into an electrical outlet. There is however some CCTV cameras that are battery operated.

VI. HARDWARE ARCHITECTURE

A. 8051 NODE

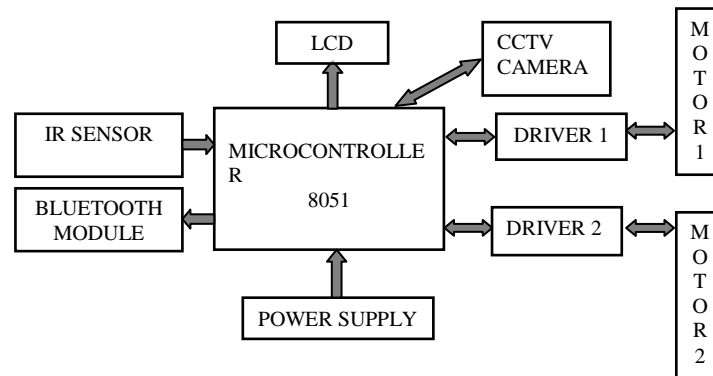


Figure 1: Block diagram of 8051 node

VII. ADVANTAGES

1. An unmanned vehicle use for the transporting the material from one point to the other.
2. There is a live control over the robot during its performing work.
3. Transmission of data from the robot to the server by using wireless technology.
4. Well programmed to identify the obstruction across its path.
5. Less cost and effective compared to AGV.

VIII. FUTURE SCOPE

The future scope of this project is enhanced applications with the addition of the required features. One such application is military purpose as well as in medical and industrial usage. It finds to reduce the effect of loading and unloading of any objects in the various fields. For example, as in the military field this robot is used to pull out the casualties from the particular field. And in case of industry it helps to takes the objects when reaching places out of human reach.(forging section).

IX. CONCLUSION

The proto-type industrial robot pick and place system utilizes the wireless technology with two modes as a remote control over the system using Bluetooth technology and the same with audio, sensor technology and a wireless camera is installed in such a way that it helps to keep the surveillance of the industry .also this system will be used in the field of military application such as for surveillance purpose, to pull out causalities, for security purpose etc.

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