

Implementation of Virtual Reality Technology in Industries

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Abstract:- Virtual Reality offers them the opportunity to access the framework and make an effective routine for working the hardware. Virtual mechanical observing is a strategy which is utilized to control and break down the parameters of the machine utilized as a part of businesses. Distinctive sorts of engines, for example, AC, DC, servo or stepper Motor are utilized as a part of the businesses relying on the application. We have executed the model for speed control of DC motor inside a system that can be utilized for divert mechanical checking inside various virtual and physical situations. The tuning of parameters under shifting conditions is performed by interfacing microcontrollers with virtual reality innovation utilizing Kiel Software.

Keywords: *Virtual reality, Motors (AC and DC) Zigbee, Microcontroller- ATMEL, Keil software.*

I. INTRODUCTION

Virtual reality (VR) normally alludes to PC innovations that utilization programming to produce the practical pictures, sounds and different impressions that repeat a genuine situation (or make a nonexistent setting), and reenact a client's physical nearness in this condition. VR has been characterized as "A Realistic and immersive reenactment of a three-dimensional condition, made utilizing intelligent programming and equipment, and experienced or controlled by development of the body "or as an "immersive, intuitive ordeal created by a PC".

The electric drive structures used as a piece of current applications are logically required to meet higher execution and steadfast quality necessities. The DC motor is an appealing piece of equipment in various mechanical applications requiring variable speed and load properties on account of its straightforwardness of controllability. Microcontrollers give a sensible technique for tending to these necessities. The AT89S51 is composed with static rationale for operation down to zero recurrence and backings two programming selectable power sparing modes. The Idle Mode stops the CPU while permitting the RAM, clock/counters, serial port and intrudes on framework to keep working.

Inferable from the great referred to attributes, Zigbee innovation has risen as a favored innovation for short-run correspondence in remote mechanical mechanization. Inside the mechanical situations remote exchanging, remote checking, supervisory or appropriated control are the key difficulties that require remote sensor systems for doing each one of those operations in which

cost, separate cover and speed of information exchange are the parameters to be considered.

Using Virtual reality technology, Atmel microcontroller and Zigbee communication technology, a virtual environment is created where workers can control the machines without physical contact.

II. EXISTING SYSTEM

In manufacturing industries, one wrong move can have dire consequences. For example, an employee who is not familiar with machine controls might accidentally injure themselves or a co-worker while performing the job duties.

Problems In Existing System:

- Manual control.
- Unsafe system.
- Unreliable system.
- Risk in human life

III. PROPOSED SYSTEM

Virtual Reality offers them the chance to master the system and create an efficient routine for operating the equipment. Instructors can also monitor their performance and remedy any issues promptly, which helps to prevent on-the-job fatalities and avoid compliance violations.

A. ANALYSIS OF VIRTUAL REALITY DEVICE

Virtual reality comes, really, from the definitions for both "virtual" and 'reality'. The significance of "virtual" is close and the fact of the matter is the thing that we experience. Virtual Reality solidifies with the ZIGBEE handset unit for data transmission and a USB camera for picture revamping and programming for picture taking care of. Virtual Reality can without quite a bit of an extend interface with PC or Laptop by the USB driver. By running the application, you can accommodate the partition by study the camera picture available in the PC or Laptop in which the enhance association can done.



Figure.1: Virtual Reality Kit

B. ELEMENTS OF VIRTUAL REALITY

The elements rely on upon the 3-I which remains for imbue, intercourse and imaginativeness.

a) creativeness, also called nearness, is the sentiment being available or starting a piece of the PC produced globe. This is accordingly of the incitement of the homosopiens detects (seeing, oral , reek and so forth) by the framework.

b) cross-fertilization is a methods for speaking accompanied by framework, however not at all like the conventional Human-Computer Interaction which utilizes 1 dimensional and 2 dimensional implies, similar to mouse, console or keypad, association in VR is for the most part through 3 dimensional (3D) implies. A few components for connection in VR frameworks are adequacy, ongoing response and human support.

c) creative power can be viewed as the prospect of the framework creator to execute a specific objective. With the appropriateness of parts of the VR framework for complex critical thinking in differing subject, its utilization as a more proficient and powerful methods for communicating thoughts than the conventional 2D drawing or content clarification, can't be debated.

IV. BLOCK DIAGRAM

It consists of two parts namely

- Transmitter and
- Receiver.

A. TRANSMITTER

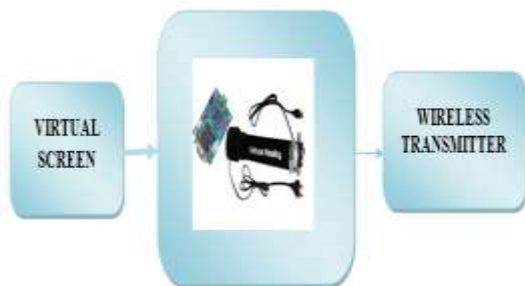


Figure.2: Block Diagram of Transmitter

B. RECEIVER

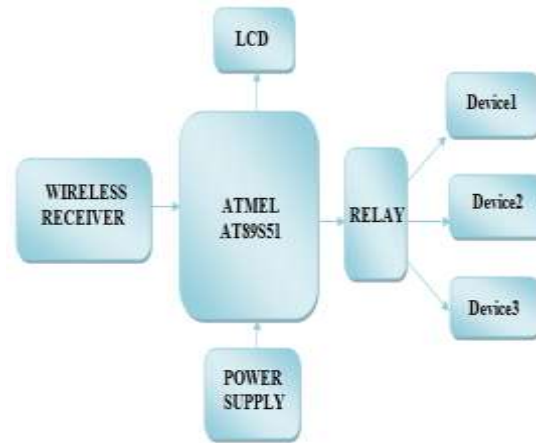


Figure.3: Block Diagram of Receiver

C. WORKING

The input is given to the virtual reality gadget where the transmitter shows the virtual screen. It comprises of the current situation with the gadget/stack which will be worked. At the point when an operation is to performed, by touching the virtual screen we can give the contribution to the transmitter which changes over the computerized input motion into simple yield flag and it is encouraged to the beneficiary. Presently the beneficiary is associated with microcontroller (AT89S51) where the program is implanted by utilizing KEIL programming to control the heaps. Here we utilize AC and DC engine where the speed control of DC engine is worked in three phases as LOW, MEDIUM, HIGH and ON/OFF of AC engine.



Figure.4:Working Block Diagram

- **INPUT DEVICES:** Here virtual reality device shown in figure.1 is the input device where input is given by touching on the screen which is visualized by the device probably on the wall.
- **COMPUTER/VR ENGINE:** It must be chosen by the necessity of the application. Realistic show and picture era are the absolute most critical elements and tedious assignment in a VR framework. The decision of the VE motor relies on upon the application field. Here Atmel (AT89S51) microcontroller is used to interface the input device with the output devices by programming using Keil Software.
- **OUTPUT DEVICES:** The machines (DC and AC motors) used in the industries are considered as output devices where the speed of the motor is controlled and performance is analyzed.

Interfacing Atmel(AT89S51) with relays which are later connected with the machines.

D. ANALYSIS OF ATMEL- MICROCONTROLLER

A microcontroller is a lone chip microcomputer created from VLSI manufacture. A miniaturized scale controller is otherwise called installed controller. Today different sorts of microcontrollers are accessible in market with various word lengths, for example, 4bit, 8bit, 64bit and 128bit microcontrollers. Microcontroller is a packed small scale PC produced to control the elements of implanted frameworks in office machines, robots, home apparatuses, engine vehicles, and various different devices. A microcontroller includes segments like – memory, peripherals and above all a processor. Microcontrollers are fundamentally utilized in gadgets that need a level of control to be connected by the client of the gadget.

E. ANALYSIS OF ZIGBEE COMMUNICATION TECHNOLOGY

Zigbee is exceptionally intended for minimal effort, low information rate and low-control utilization remote individual region systems (WPANs). Its work topology of system makes this system most appropriate for modern computerization too for production line floor mechanization.



Figure.5: Zig Bee

It comprises of three sorts of gadgets: Zigbee coordinators, routers and devices. The Coordinator is the base of the system as it goes about as a scaffold to different systems. It handles and stores the data for getting and transmitting operations inside the system. Switches pass information to different gadgets as mediators. So as to make longer battery life and less many-sided quality, end point gadgets are made for restricted usefulness.

Zigbee works in two modes: guide and non-reference point mode. In a non-signal mode, the beneficiaries of the switches and the organizers are persistently dynamic, and subsequently, in this kind of topology, the power supply utilization is more. In a signal mode, the facilitator intermittently stirs and transmits reference points to the switches of that system. These reference points additionally stir different hubs of the system for their status of approaching messages. Without any messages, these hubs and facilitators backpedal to the rest mode, and subsequently, the power is monitored in the guide mode.

V. SOFTWARE IMPLEMENTATION

Keil Software is the main seller for 8/16-bit improvement devices (positioned at top place in the 2004 Embedded Market Surveys of the Embedded Systems and). Keil Software is spoken to worldwide around the 40 nations. In so much as the market presentation in 1988, the Keil C51 Compiler is the true business grade and backings high than 500 current Intel MCS-51 gadget variations. Presently, Keil Software offers advancement apparatuses for ARM.

It is fulfilled to report reenactment support for the Atmel AT91 ARM gathering of microcontrollers. The Keil μ Vision Debugger reenacts the whole ARM course set and the on-chip peripherals for each contraption in the AT91 ARM/Thumb microcontroller family. The consolidated test framework gives complete periphery diversion. Another new components in the μ Vision applet include:

- a) A consolidated Software Logic caricaturist that decide I/O movements and furthermore program factors and enables fashioners to make complex banner taking care of computations
- b) An Execution Profiler that measures time spent in every limit, source line, and building operator rule. Directly planners can find absolutely where programs contribute the most vitality.

The μ Vision2 IDE from Keil Software, consolidates extend administration, make offices, source code altering, program troubleshooting, and finish reproduction in one effective condition. μ Vision2 helps you get programs working speedier than at any other time while giving a simple to-utilize advancement stage. The editorial manager and debugger are incorporated into a solitary application and give a consistent installed extend advancement condition.

VI. HARDWARE IMPLEMENTATION



Figure.6: Virtual reality Kit for Motors ON/OFF Operation

VII. RESULT

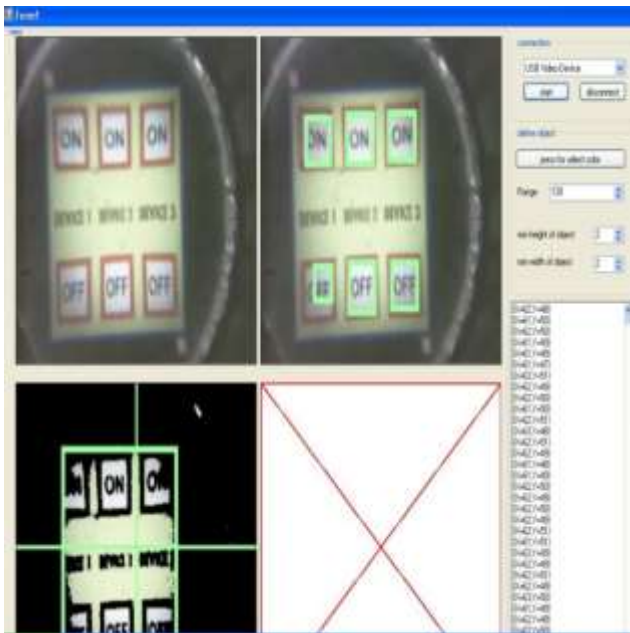


Figure.7: Result Screen from the VR

By touching the screen and using the other components we can easily ON/OFF the AC motors and also can control the speed of the DC motors.

As a result, the implementation of hardware and software has been executed and the hardware output is obtained. Comparison of existing system and proposed system is listed below in order to analyze the results in an efficient manner.

A. EXISTING SYSTEM

- Manual control
- Unsafe system
- Unreliable system

B. PROPOSED SYSTEM

- Automatic control.
- Wireless technology used.
- Reliable system.
- A Wireless Link between two or more objects.
- Designing a set of protocols for inviolable and robust communication between the modules.

VIII. CONCLUSIONS

Virtual condition innovation has been creating over long stretch, and offering nearness reproduction to clients as an interface representation to an integrated world has turned into the examination motivation for a developing group of analysts and enterprises. More research has exhibited its handiness both from the developmental forthcoming of giving a superior UI and from the progressive planned of empowering already unimaginable applications.

In enterprises, human work can be lessened by making the virtual condition where specialists can work the machines from the control room as opposed to working it straightforwardly.

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