VIRTUAL REALITY BASED CONTROLLED HOME APPLIANCES

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ABSTRACT

Virtual Reality (VR), generally cited as an immersive multimedia system may be computer-simulated surroundings that will simulate physical presence in places within the world. Virtual reality can recreate sensory experiences, that embody virtual style, sight, smell, sound, touch, etc. Most current video game environments area unit primarily empirical experiences, displayed either on a video display or with special stereoscopic displays, and a few regulated simulations embody further sensory info and emphasize real sound through speakers or headphones targeted towards witnesses. Some advanced, tactile systems currently embody tactile info Virtual Projection is will flip virtually any surface into a dynamic display screen. A projection device may be a sort of device whereby the image of a virtual secret's projected onto a surface It involves the employment of an optical device, interference, optical phenomenon strength recording, and appropriate illumination of the recording in a very planned system we tend to area unit victimization virtual based mostly to show pictures. Lightweight is copied somebody's and wherever he wants then projected through the source of illumination. secret's ironed then the image is captured by wireless camera Image is processed in mat work and perform a corresponding task is thought as "VIRTUAL REALITY BASED CONTROLLED SYSTEM".

1. INTRODUCTION

An image process is the form of signal processes that the input is a picture, like a photograph or a video frame; the output of the image process could also be either a picture or a collection of parameters associated with the image. Most image-processing techniques involve treating the image as a two-dimensional signal and applying the customary signal-processing techniques to that.

An interactive whiteboard (IWB), could be a massive interactive show that connects to a pc. A projector comes desktop onto the board's surface wherever users manage the computer employing a pen, finger, stylus, or different device. The board is often mounted to a wall or floor stand. They are utilized in a range of settings, together with lecture rooms in any respect levels of education, in company boardrooms and work teams, in coaching rooms for the skilled sports coaching jobs, in broadcasting studios, and others.

An interactive whiteboard (IWB) device is connected to a laptop via USB or a port cable, alternatively wirelessly via Bluetooth or a two.4 GHz wireless. Within the latter case, WEP and WPA/PSK security are offered. A tool driver is typically put in on the hooked up laptop, so the interactive whiteboard will act as like somebody's data input device (HID), sort of a mouse. The computer's video output is connected to a digital projector, so pictures could also be projected on the interactive whiteboard surface.

2. LITERATURE SURVEY

Pico projectors hooked up to mobile phones enable users to look at phone content employing a giant show. However, to supply input to projector phones, users have to be compelled to check out the device, amusing their attention from the projected image. In addition, different collocated users haven't any method of interacting with the device. Sharing data displayed on a mobile device's little screen with collocated individuals is troublesome. Pico projectors create it easier for mobile users to share visual data with those around them employing a projected image, which might be abundant larger than the device's screen.

The Recent progress in stereo algorithmic program performance is quickly outpacing the flexibility of existing stereo knowledge sets to discriminate among the best-performing algorithms, motivating the requirement for more difficult scenes with correct ground truth data. This paper describes a way for getting high-complexity stereo image pairs with pixel-accurate correspondence data victimization structured lightweight. In contrast to ancient range-sensing approaches, our technique doesn't need the activity of the sunshine sources and yields registered inequality maps between all pairs of cameras and illumination projectors.

Skin put is a technology that appropriates the organic structure for acoustic transmission, permitting the skin to be used as an associate degree input surface. Especially, we tend to resolve the situation of finger faucets on the arm and hand by analyzing mechanical vibrations that propagate through the body. We tend to collect these signals employing a novel array of sensors worn as an associate degree armband. Appropriating the organic structure as an associate degree data input device is appealing not solely as a result of we've got roughly 2 sq. meters of external area, however additionally as a result of a lot of it's simply accessible by our hands.

Bonfire is a self-contained mobile computer system that uses two portable computer-mounted optical maser micro-projectors to project associate degree interactive show area to either aspect of a laptop keyboard. As well as every micro-projector could be a camera to change hand gesture pursuit, seeing, and data transfer at intervals in the projected area. Thus, fire is neither a pure portable computer system nor a pure work surface system, however, associate degree integration of the two into one new mobile computing platform.

Play anywhere, a front-projected laptop vision-based interactive table system that uses a brand new commercially accessible projection technology to get a compact, self-contained type issue. Play Anywhere's configuration addresses installation, standardization, and movability problems that area units typical of most vision-based table systems, and thereby is especially motivated in client applications.

3.   PROPOSED SYSTEM FUNCTION

PROPOSED SYSTEM

A Projector and camera has been used to form up a 3-D measurement system. During this field, structured lightweight, that achieves 3-D reconstruction by analyzing a feedback image of a particular pattern projected on the thing, is one in every of the foremost promising techniques however the procedure quality of 3-D reconstruction is high, which can greatly influence the period of time capability of the system. Therefore, we have a tendency to propose a unique approach that takes advantage of the buttons' distortions caused by the fingers to notice the bit operation on the screen.
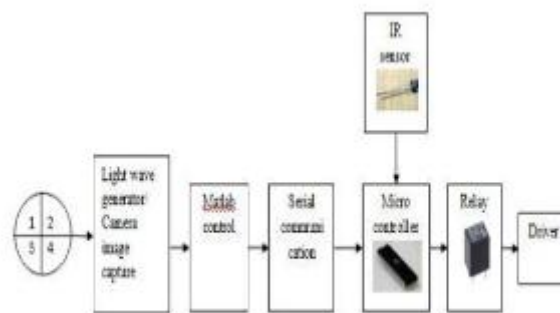
FUNCTIONAL BLOCK DIAGRAM

Figure 1: Block Diagram

4.   HARDWARE DESCRIPTION

ARDUINO

Arduino is a pc hardware and software program gadget enterprise, mission and user network that styles and manufactures microcontroller kits for constructing virtual devices and interactive items that may sense and manage objects within the physical world. The project's board styles use a range of microprocessors and controllers. These systems offer sets of digital and analog input/output (I/O) pins that will be interfaced to varied enlargement boards ("shields") and alternative circuits. The boards feature serial communications interfaces, as well as Universal Serial Bus (USB) on some models, for loading programs from personal computers. The microcontrollers are in the main program employing a non-standard speech of options from the programming languages C and C++.

Figure 2: Diagram of Arduino
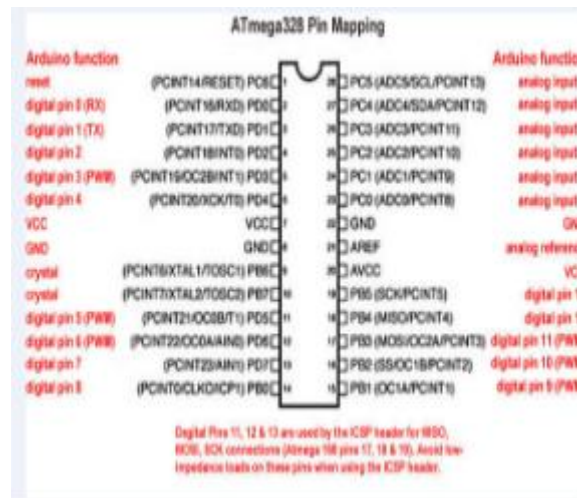
Figure 3: Pin Diagram of Arduino UNO
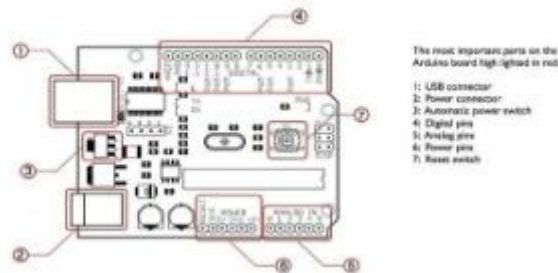
Figure 4: Parts in Arduino Board

COMMUNICATION

The Arduino Uno encompasses a range of facilities for acts with a laptop, another Arduino, or different microcontrollers. The ATmega328 provides UART TTL (5V) serial communication, that is obtainable on digital pins zero (RX) and one (TX). Associate degree ATmega8U2 on the board channels this serial communication over USB and seems like a virtual com port to software package on the pc. The '8U2 microcode uses quality USB COM drivers, and no external driver is required. However, on Windows, a .Inf file is needed. The Arduino software package includes a serial monitor that permits easy matter information to be sent to and from the Arduino board. The RX and Lone-Star State LEDs on the board can flash once information is being transmitted via the USB-to-serial chip and USB affiliation to the pc (but not for serial communication on pins zero and 1).

PROGRAMMING

The Arduino Uno will be programmed with the Arduino software system. Pick "Arduino Uno" from the Tools > Board menu (in keeping with the microcontroller on your board). For details, see the reference and tutorials. The ATmega328 on the Arduino Uno comes pre-burned with a boot loader that permits you to transfer new code thereto while not the employment of associate degree external hardware computer programmer. It communicates victimization of the initial STK500 protocol (reference, C header files).

AUTOMATIC (SOFTWARE) RESET

Rather than requiring a physical press of the button before AN transfer, the Arduino Uno is meant in an exceeding means that enable it to be reset by a software package running on a connected laptop. One in all the hardware flow management lines (DTR) of the ATmega8U2 is connected to the reset line of the ATmega328 by one hundred nanofarad electrical devices. Once this line is declared (taken low), the reset line drops long enough to reset the chip. The Arduino software package uses this capability to permit you to transfer code by merely pressing the transfer button within the Arduino set. The boot loader could have a shorter timeout because lowering of DTR with the start of the switch. This setup has alternative implications.

LCD

An electronically modulated optical device in which liquid crystals uses the light-modulating properties and are combined with polarizes is called Liquid Crystal Display (LCD) . Liquid crystals do not emit light directly, rather using a reflector or backlight to produce images in color or monochrome. LCDs are available to display arbitrary images (as in a wellknown-reason computer display) or fixed pictures with low records content material, which can be displayed or hidden, including preset words, digits, and seven-section displays, as in a digital clock.

Figure 5: Liquid Crystal Display (LCD)

POWER SUPLLY

The ac voltage, generally 220V rms, is connected to an electrical device, that steps that ac voltage all the way down to the extent of the required dc output. A diode rectifier then provides a full-wave corrected voltage that's at the start filtered by an easy condenser filter to provide a dc voltage. This dc voltage has ripple or ac voltage variation. A regulator circuit removes the ripples and conjointly remains constant dc worth although the input dc voltage varies, or the load connected to the output dc voltage changes. This voltage regulation is sometimes obtained mistreatment one amongst the favored transformer IC units.

BLOCK DIAGRAM
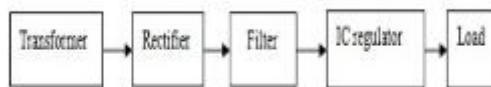
Figure 6: Power supply block Diagram

5. WORKINNG PRINCIPLE

TRANSFORMER

The transformer will step down the supply voltage (0-230V) to (0-6V) level. Then the precision rectifier is connected to the secondary of the potential transformer, which is implemented with the help of op–amp. The benefits of using precision rectifier are it's going to deliver high voltage output as DC; rest of the circuits will supply handiest RMS output.

BRIDGE RECTIFIER

When 4 diodes are connected as shown in the figure, it is called as bridge rectifier. The input to the circuit is carried out to the diagonally opposite corners of the network, and the output is taken from the final corners. Let us assume that the transformer is working well and there is a negative potential, at point B and a positive potential at point A. the positive potential at point A will reverse bias D4 and forward bias D3.

The negative potential at point B will reverse D2 and forward bias D1 . At this time D4 and D2 are reverse biased and blocks current flow ; D3 and D1 are forward biased and allow current to flow through. The path for current flow is from point B through D1, and to RL, next to D3, and finally to the secondary of the transformer back to point B. this path is indicated by solid arrows. Waveforms (1) and (2) is observed across D1 and D3.

One benefit of a bridge rectifier over a conventional full-wave rectifier is that with a given transformer the bridge rectifier produces a voltage output that is nearly twice that of the conventional full-wave circuit. This could be shown by assigning values to some of the components shown in views A and B. Assume that the same transformer is used in both the circuits. The peak voltage developed between points X and y is 1000 volts in both the circuits. In conventional full-wave circuit shown—in view A, the peak voltage from the center tap to either X or Y is 500 volts. Since only one diode can conduct at any instant, the maximum voltage that could be rectified at any instant is 500 volts.

The maximum voltage that appears across the load resistor is never exceeds-500 v0lts, as result of small voltage drop across the diode. In view B, the maximum voltage that can be rectified is the full secondary voltage, which is 1000 volts in the bridge rectifier. The peak output voltage across the load resistor is nearly 1000 volts. Both circuits using the same transformer, the bridge rectifier circuit produces higher output voltage than the conventional full-wave rectifier circuit.

IC VOLTAGE REGULATORS

Voltage regulators consist of wide range of ICs. Regulator IC unit contains the circuitry for comparator amplifier, reference source, overload protection, and control device, all in a single IC. IC units will provide regulation of either a fixed negative voltage, a fixed positive voltage, or an adjustably set voltage. The regulators could be selected for operation with load currents from hundreds of milli amperes to tens of amperes, corresponding to power ratings from milli watts to tens of watts.

A fixed three-terminal voltage regulator has an unregulated dc input voltage, Vi, applied to one input terminal, a regulated dc output voltage, Vo, from a second terminal, with the third terminal connected to ground. The series 78 regulators will provide fixed positive regulated voltages from 5 to 24 volts. Similarly, the series 79 regulators will provide fixed negative regulated voltages from 5 to 24 volts.

[1]   For ICs, microcontroller, LCD 5 volts

[2]   For alarm circuit, op-amp, relay circuits 12 volts
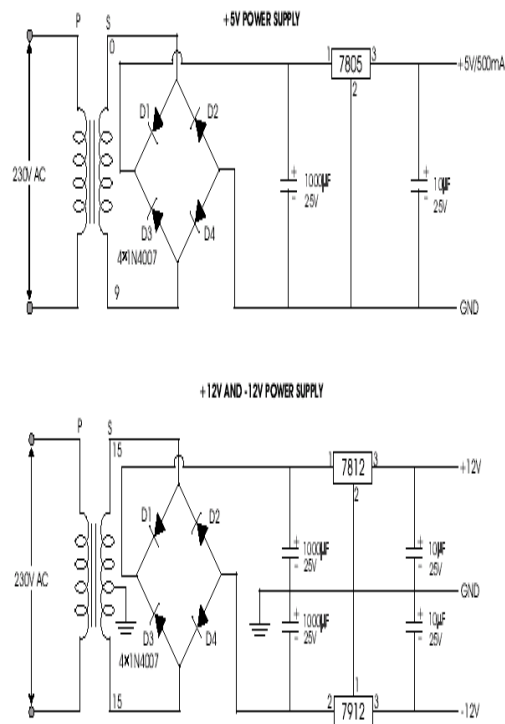
Figure 7: Diagram of IC Voltage Regulators

INFRARED

Infrared (**IR**) radiation is a type of electromagnetic radiation (a wave with electricity). It has longer wavelength that human can see and shorter than microwaves. The word *infrared* means *below red*. The word *infra means below in Latin* and the English word *red*. (It has a frequency *below* the frequency of red light.) Red light has the longest wavelength that human eyes can see. Infrared waves cannot be seen by human eye. The infrared wave is between 750 nm and 1 mm. People sense infrared as heat. In remote controls infrared are used to send the control signals.

Infrared (IR) light is electromagnetic radiation with longer wavelengths than that of visible light, extending from the nominal red edge of the visible spectrum at 0.74 micrometres (μm) to 0.3 mm. The wavelengths corresponds to this frequency range of approximately 430 down to 1 THz, and

includes most of the thermal radiation emitted by objects near room temperature. Infrared light is absorbed or emitted by molecules when they change their rotational-vibrational movements. The infrared radiation was first discovered by astronomer William Herschel in 1800 .

Infrared light is used in scientific, industrial, and medical applications. Night-vision devices uses infrared illumination and it allows people or animals to be observed without the observer being detected. In astronomy, imaging at infrared wavelengths allows observation of objects difficult to seen by interstellar dust. Infrared imaging cameras are used to observe changing blood flow in the skin, to detect heat loss in insulated systems and to detect overheating of electrical apparatus.

Humans at normal body temperature radiate chiefly at wavelengths around 10 μm (micrometers), as shown by Wien's displacement law. At the atomic level, infrared energy brings out vibrational modes in a molecule through a change in the dipole moment, making it a useful frequency range for study of these energy states for molecules of the proper symmetry. Infrared spectroscopy examines transmission and absorption of photons in the infrared energy range, based on their frequency and intensity.

MATLAB

MATLAB stands for MATrix Laboratory. Everything could be a matrix – simple to try and do algebra. MATLAB ("MATrix LABoratory") could be a tool for numerical computation and images. The essential information component could be a matrix, therefore if you would like a program that manipulates array – based information it's typically quick to written down and run in MATLAB. It is a high - level language for technical computing.

6. CONCLUSION

IPS, an interactive projective system, was proposed and composed of a projector and a mono – camera. A bit of interaction on a flat surface was supported by the system. To attain this goal, we have a tendency to explore the finger's influence on the button's distortion and engineered a model to explain the button's distortion. We have a tendency to find that there was a big correlation between the button's distortion and also the height of a clean finger. Then a unique, fast, and strong approach was planned to sight the bit action on the surface. It was performed in three stages: 1) mapping by homography and extracting the region of interest, 2) distortion detection, and 3) bit judgment. Meanwhile, the button's distortion detection, which was almost like cagey edge detection, was strong to the shadows and finger's edge, by scrutiny the detected edge direction with the button edge's direction.

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