

Virtual Reality based Controlled Home Appliances

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Abstract- Virtual Reality (VR), which is frequently referred to as an immersive multimedia system, is a type of computer-simulated environment that mimics being physically present in different locations across the globe. Through the use of virtual reality, it is possible to duplicate sensory experiences such as sight, hearing, touch, and smell. Today, some sophisticated tactile systems incorporate tactile information. Almost any surface can be transformed into a dynamic display screen using virtual projection. A projection device is a type of apparatus that projects the picture of a virtual secret onto a surface. It requires using an optical device, interference, capturing optical phenomenon strength, and properly illuminating the recording in a well designed way. We typically use virtual reality systems to display pictures. Secret is ironed before a wireless camera takes a picture of it. When an image is processed mathematically, it is considered to be CONTROLLED SYSTEM BASED ON VIRTUAL REALITY

Keywords- ATMEGA08, DC Motor, Leapmotion, USB Camera, LCD, MATLAB software 12.0

I. INTRODUCTION

Leap motion is developed by MICHAEL DUCHWALD and DAVIDHOLZ. Leap motion control is based on the idea of magic. In a popular cars like BMW's 7 series will feature gesture recognition to allow drivers to control its infotainment system with simple hand movements. The Leap motion controller can be used to create a virtual touch surface in the air. By touching the space you can create virtual touch even on your screen. Leap motion is step forward it to the computer interaction. 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. 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. 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.

II. 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. [1]

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. [2]

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.[3] 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. [4]

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.[5]

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. [6]Play anywhere, a front-projected laptop vision-based interactive table system that uses a brand new commercially accessible projection technology to get a

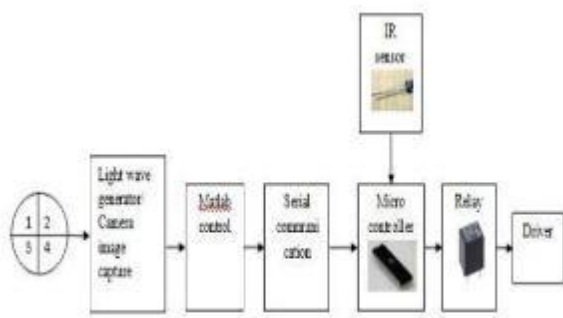
compact, self-contained type issue. Play Anywhere’s configuration addresses installation, standardization, and movability problems that area units typical of most vision-based table systems, and thereby is especially motivated in client applications.

III. EXISTING SYSTEM:

User can control the electronic visual display through a touchscreen. A user can give input through simple or multi-touch gestures by touching the screen with a special stylus one or more fingers. It enables the user to interact directly with what is displayed, rather than using a mouse, touchpad. Exact communication among users. Touchscreens are common in devices such as game consoles, personal computers. Demerits of a touchscreen is exactness, display screen will stained, when touch the screen with wet finger it will sense an electric shock. Kinect which is a motion sensing input device developed by Microsoft in the year 2010. Users can interact with Xbox without touching. It can control through a gesture and spoken commands. Some demerits of Kinect:-requires an additional power supply, lethargic feedback, does not recognize a body gesture and not follow a spoken command frequently.

IV. 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.



Block diagram of the existing system

V. HARDWARE COMPONENTS :

1. ATmega328

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)



2. LCD Display

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 well known-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.



3. Leapmotion

Leap motion is the most affordable new mechanism. It is a sensing device joined with a computer via USB port. It can recognize a tiny movements also. It is 200 times more sensitive than existing technologies. Leap motion can rule a computer through a gesture by using fingers or pen. It has a powerful reorganization. It is more accurate than mouse and reliable as a keyboard. Leap motion can control a 3-D actions by using a finger and hand.



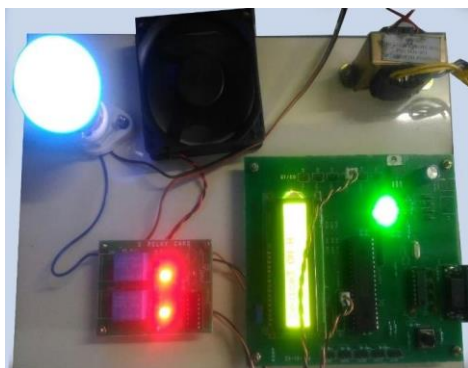
VI. SOFTWARE COMPONENTS

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.

VII. RESULTS

The employment of the Home appliance Control in virtual reality by using leap motion in Fig.5. A Bulb and an electrical fan were controlled by the leap motion somatosensory controlled switches. The relay module is operated as electrical controlled switches which receives a signal from PIC16F877A that received the instructions were controlled by using leap motion somatosensory. The Bulb was employed to prove that this system can control other AC electrical appliances, if the users need to increase the operations of the AC electrical appliance .



Home appliance Control in virtual reality by using leap motion

VIII. DISCUSSIONS

The module supports the probability of the games that can be enlarged to the real-time applications. The light beams, water beams, and audio signals can be transmitted by the control of this module in VR. Therefore, the games will be more attractive than the actions of the game devices only in the VR. The mechanism is mainly used for disabled persons to control the light bulb, fan and other electrical appliances. The non-touch VR switches avert to the chances of infections which cause from the hands’ touches of the switches in some places like hospitals, surgery operating room. The price of this system will be decreased by lots of production. The trend of using the somatosensory sensors have been predicted to be famous in the forthcoming. Therefore, the model module is a basic trail of the forthcoming evolutions. The relay module was operated as an electrical controlled switches which received the signal from PIC16F877A that received the instructions that were controlled by using leap motion .The module supports the probability of the games that can be enlarged to the real- time applications. The light beams, water beams, and audio signals can be transmitted by the control of this module in VR. Therefore, the games will be more attractive than the actions of the game devices in the VR.

IX. CONCLUSIONS

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:

- Mapping by homography and extracting the region of interest,
- Distortion detection
- 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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