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VIRTUAL REALITY (HOLOGRAM) BASED FOOD SUPPLY SYSTEM

Ibrahim Sheriff.A Department of ECE,Loyola Institute of Technology

Devaruban.D Department of ECE,Loyola Institute of Technology

jana vamsi krishna Department of ECE,Loyola Institute of Technology

Mrs.S.V.Priya prof Department of ECE,Loyola Institute of Technology

ABSTRACT

Virtual Reality is seen as the high-end of human-computer interactions and it has the potential to target a wide range of applications .To improve the standardization and automation of disaster operation management, a new method of emergency management based on the activity network technology is presented. Firstly, the emergency plan is built upon emergency response activities by using the activity network technology.While a virtual trajectory may be represented using straight lines connecting waypoints of interest, this simple model does not accurately represent typical user behavior. We implemented the model within a framework that can be used for redirect food distribution within different virtual and physical environments. It is useful for the evaluation of redirected of parameters under varying conditions. The characteristics of each operation mode are analyzed, which provides an important reference for the researchers of the operation and management of the process food supply chain. In this project, virtual reality is projected from helicopter or far distance. The projected image with listed basic needs like food ,water, medicine....the person needs medicine need to stand on that projected medicine image then the dispatch section will distribute medicine for them.

Keywords: virtual reality sensing system,monitor,cpu,WSN,micro controller,relay,gyroscope,spectrometer,plexi glass.

I.INTRODUCTION

The concept of abrasive holograms was popularized by William Beaty in the 90s .Abrasive holography allows holographic effects to be achieved with simple means .In its basic form, arcs or circles are scratched onto the surface of reflective transparent plastic plates such as plexi-glass using calipers .The back of the glass is covered with black non-reflective material .When viewed under a bright light source, a certain point on the scratched arc will reflect the light as a bright highlight. The highlight position is determined by the position of the viewer and the light source. With a fixed light source, the reflected spot will move along the arc as the observer moves the head.

II. EXISTINGSYSTEM

There are mainly two existing types of gesture recognition methods, i.e vision- based and accelerometer and/or gyroscope based .These have some limitations like ambient optical noise, slower dynamic response, and relatively large data collections/processing of vision-based method .Less accuracy.

III. PROPOSEDSYSTEM

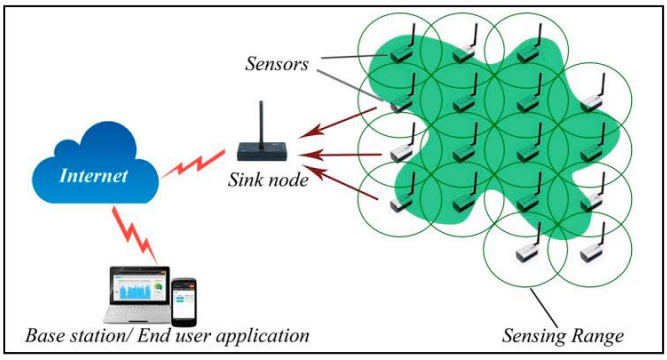
In hologram ,which detects wavelength distribution of a light source using a multiplex Fresnel hologram. In order to measure the wavelength distribution of the light source, a spectrometer is usually used, but in this case it is difficult to measure the wavelength distribution while using the light source.To separate the block in light source food, cloth etc.We using Transmission and receiver section.

IV.HARDWARE DISCRIPTION

WIRELESS SENSOR NETWORKS:

A wireless sensor network is the wireless network consisting of the spatial distribution autonomous devices which using the sensors to monitor the physical or environmental conditions in the process. A WSN system gives a gateway that provides the wireless connectivity again back to the wired world and distributed nodes in the system.

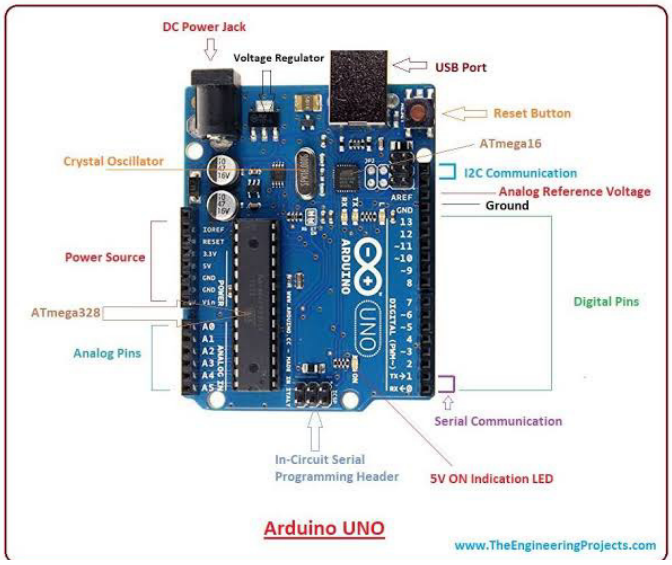
The WSN is built in of nodes from a few to several hundreds or even thousands,where each node is connected to one sensors.each of the sensor network node has the typically several parts they are a radio transceiver with an internal antenna or the connection to an external antenna,a microcontroller and an electronic circuit for interfacing with the sensors.



ARDUINO UNO (MICRO CONTROLLER):

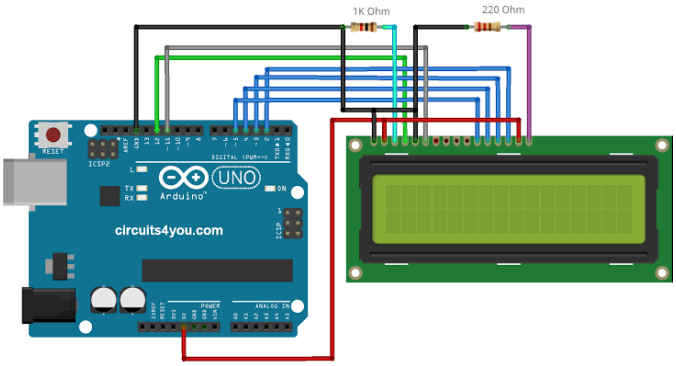
Arduino uno is the single board micro controller which meant to make the applications more accessible which are interactive objects and to its surroundings.the hardware board designed around with an 8 bit atmet avr micro controller or a 31 bit Atmet ARM.current models consists of a usb interface and the 6analog input pins and 14 digital input output ports that allows the user to attach the various extension.it is based on ATmega328.it hhas 14 digital input output pins in which the 6 pins can be used as for PWM outputs,a 16 mhz ceramic resonator ,and an ICSP header,a USB connection ,6 analog inputs ,a power jack and a reset buttons where present.this contains all the required support needed for the micro controller.

In order to get started ,they were simply connected to a computer with a USB cable or with the AC to DC adapter or a battery.this board varies than the other boards which did not use the FTDI usb to the serial driver chip in the system.it is featured by the Atmega16U2 programmed as a usb to serial convertor.



LIQUID CRYSTAL DISPLAY:

A liquid crystal display (LCD) is a flat panel display or the electronically modulated optical device which uses the light modulating properties of the liquid crystal.they do not emit the light directly ,rather than they using a backlight or reflector to produce images in color.LCDs are available to display the arbitrary images or fixed images with the low information ,as in a digital clock .they were using the same basic technology ,except that the arbitrary images were made up of the large number of small pixels ,were other displays having a larger elements .a character positive lcd with a backlight which will have black lettering on a background and they are the color of the backlight ,and a character negative lcd in which a black background with the letters are the same color as like the backlight .optical filters were used to white on blue lcds to give them their characteristic appearances.



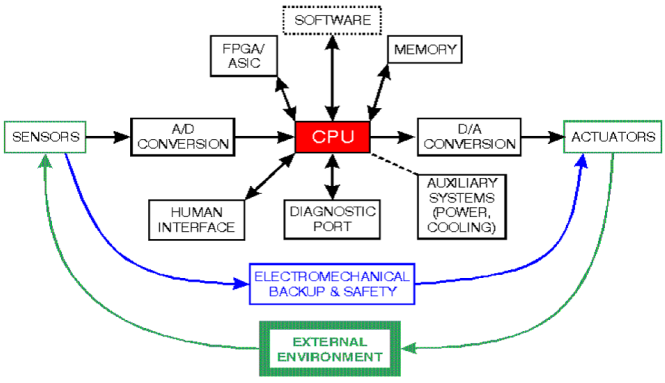
RELAY:

A relay is an electrically operated switch in which many relays were used as an electromagnetic to mechanically operate a switch .relays are used where it is needed to control a circuit by a separate low power signal ,or where the several circuits are to be controlled by one signal .relays were used extensively in the telephone exchanges and early computers to perform the logical operations .a type of relay that will handle the high power in which it required to directly control electric motor or the other loads is called as the contactor.

V.SOFTWARE DISCRIPTION:

EMBEDDED SYSTEM:

An embedded system is a special-purpose computer system designed to perform one or a few dedicated functions, often with real-time computing constraints. It is usually embedded as part of a complete device including hardware and mechanical parts. In contrast, a general-purpose computer, such as a personal computer, can do many different tasks depending on programming. Embedded systems have become very important today as they control many of the common devices we use. Since the embedded system is dedicated to specific tasks, design engineers can optimize it, reducing the size and cost of the product, or increasing the reliability and performance. Complexity varies from low, with a single microcontroller chip, to very high with multiple units, peripherals and networks mounted inside a large chassis or enclosure. In general, "embedded system" is not an exactly defined term, as many systems have some element of programmability.



HOLOGRAM:

WORKING PROCESS:

The setup for 3D optical correlation based on binary computer-generated hologram. The collimated plane wave is generated for the illumination, and the encoding process is conducted based on an iterative approach between spatial space and reciprocal space. Here, the 2D input image is divided into some squared blocks which are placed in 3D space [23], [28]–[31]. Each block contains some neighbouring pixels of the input image. During the iterative retrieval, some data, such as the input image placed in 3D space and a series of axial distances, are applied as known parameters, and the encoding objective is to generate an approximated phase-only pattern.

The iterative encoding process is described as follows:

1. Symbol i (1,2,3,……,K) is used to denote the series of squared blocks, and each block contains 16 16 × neighbouring pixels of the input image. Each block is placed at a random axial position. In the initial stage, a random phase-only pattern (in a range of [0, 2pi]) is used as a guess, i.e., denoted as (,)(,). In M μ ν Symbol n denotes the iteration number, and (,) μ denotes coordinate for the phase-only pattern plane.

2. Wave propagation is conducted between the phase pattern plane and the image plane. Image (1) where WP denotes free-space wave propagation [32], () id denotes the axial distance, and (,) O ξ η denotes complex-valued wave front in the image plane. The symbol (,) ξ η denotes coordinate for the input image plane.

3. A constraint is applied in the image plane for updating the complex-valued wave front (,) O ξ η using a specific block (i.e., within the block i) to generate an updated complex valued wave front '(,). O ξ η

4. Subsequently, back propagation process is conducted by: (,) () (,) WP '(,) , in id OO μ ν ξ η −= ª° ¬¼ where (,)(,) in O μ ν denotes the wave front in phase-only pattern plane. Hence, an updated phase-only pattern can be generated by using a constraint [33]–[35].

where | | denotes a modulus operation, and (,) ˆ (,) in M μ ν denotes the updated phase-only pattern.

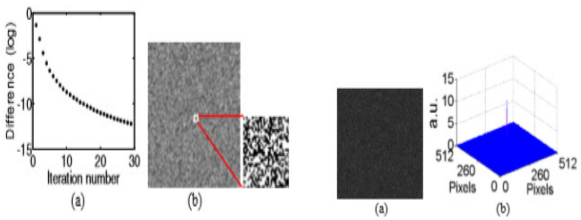
5.The updated phase-only pattern is further used, and the steps 2–4 are repeatedly applied. After all blocks (i.e., i=K) are processed, a preset threshold is used to judge whether the iterative process can be stopped. If the threshold cannot be satisfied, the updated phase-only pattern is further used for the next iteration, i.e., n=n+1. When a new iteration starts, the block symbol i should be reset as 1. If the threshold can be satisfied, the finally generated phase-only pattern is denoted as (,).M μ ν

6.Finally, an average value of [(,)] angle M μ ν (where angle denotes phase extraction) can be calculated and used as a threshold for the binarization, hence a binary phase distribution can be correspondingly generated as ciphertext, i.e., (,). B M μ ν

In practice, a coefficient or factor can be multiplied by the calculated average value to be employed as a threshold for the binarization operation. For the decoding, binary phase-only pattern and setup parameters are applied. A decoded image ˆ(,) I ξ η can be obtained by [28],[30],[31]

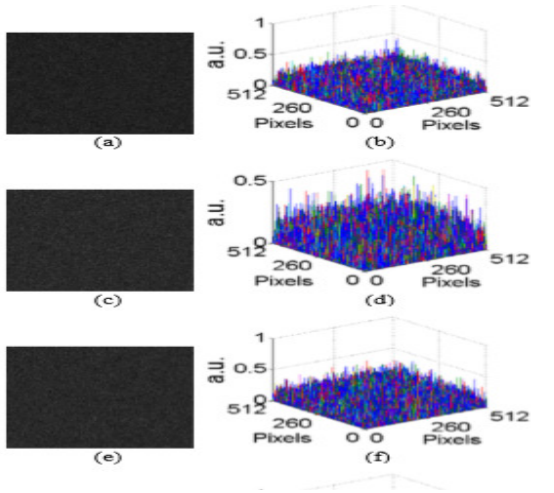
The schematic setup in Fig. 1 is computationally conducted to verify the validity. The plane wave with wavelength of 630.0 nm is applied for the illumination, and a recording device with 512 512 × pixels and 4.65 m μ pixel size can be used. During the encoding, a binary phase-only pattern is generated as ciphertext, and an average value of [(,)] angle M μ ν is calculated and used as a threshold. The series of axial distances () id is randomly distributed in a range of [6.0 cm, 15.0 cm]. Here, grayscale image "Baboon" (http://sipi.usc.edu/database/) is used as an input image. Figure 2(a) shows a relationship between the number of iterations and the calculated difference (logarithm scale) during the encoding. The threshold is set as 0.000005. It can be seen that only 29 iterations are needed, and a rapid convergence rate can be achieved in the iterative process. Figure 2(b) shows a generated binary phase-only pattern which is used as ciphertext. When an authorized receiver uses correct ciphertext and security keys, a decoded image is obtained in Fig. 3(a). Due to the designed strategy no information can be visually observed, and a correlation distribution is generated in Fig. 3(b). It is illustrated that the decoded image in Fig. 3(a) can be effectively verified.

A relationship between the number of iterations and the calculated difference (logarithm scale) during the encoding, and (b) the generated binary phase-only pattern. A small area has been enlarged to clearly show some information in the ciphertext.



Performance of system parameters is further analyzed. When only the binary phase-only pattern is wrongly used during the decoding, a decoded image is shown in (a). The corresponding correlation distribution is generated in (b). When only the wavelength contains an error of 2.0 nm during the decoding, a decoded image is shown in (c). The corresponding correlation distribution is generated.

When only the series of axial distances is wrong during the decoding, a decoded image is shown in (e). The corresponding correlation distribution is generated in (f). When the decoding process is conducted by using only an axial position (i.e., 10.0 cm) during the decoding, a decoded image is shown in (g). The corresponding correlation distribution is generated in (h). The CC values for (a), (c), (e) and (g) are -0.0021, 0.0056, -0.0004 and 0.0012, respectively. It is illustrated in (b), (d), (f) and (h) that when security keys or ciphertext are not correctly applied, only noisy nonlinear correlation maps can be generated.

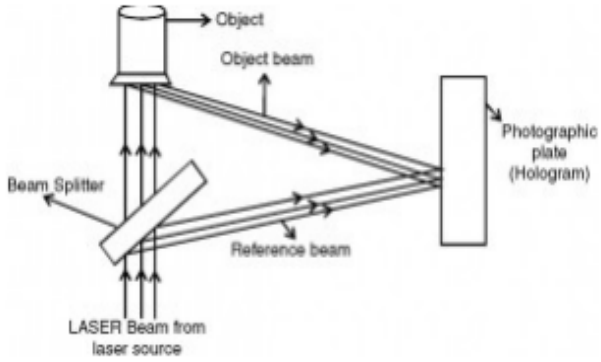


Workstations had offered higher performance than personal computers, especially with respect to CPU and graphics, memory capacity and multitasking capability. They are optimized for the visualization and manipulation of different types of complex data such as 3D mechanical design, engineering simulation animation and rendering of images, and mathematical plots. Workstations are the first segment of the computer market to present advanced accessories and collaboration tools. Presently, the workstation market is highly commoditized and is dominated by large PC vendors, such as Dell and HP, selling Microsoft Windows/Linux running on Intel Xeon/AMD Opteron. Alternative UNIX based platforms are provided by Apple Inc., Sun Microsystems, and Silicon Graphics International (SGI) (http://en.wikipedia.org/wiki/Workstation). Computer workstation is used to control several sensory display devices to immerse you in 3D virtual environmentSensory displays are used to display the simulated virtual worlds to the user. The most common sensory displays are the computer visual display unit, the head-mounted display (HMD) for 3D visual. This is an "Advanced Learning Technology Company" that creates collaborative interactive learning solutions for Federal Systems, Healthcare and Corporate Training markets (http://www.virtualheroes.com/about.asp). VHI applications facilitate highly interactive, self-paced learning and instructor-led, distributed team training on its Advanced Learning Technology (ALT) platform. Major components of this platform include the Unreal® Engine 3 by Epic Games, and Dynamic Virtual Human Technology (DVHT). ALT leverages simulation learning and digital game-based learning paradigms to accelerate learning, increase proficiency and reduce costs. DVHT combines best-in-class electronic computer game technology with a digital human physiology engine, digital pharmacokinetic drug models, accurate biomechanical parameters and artificial intelligence subroutines for the most realistic virtual humans available.

Basics of Holography A hologram is a recording in a two- or three-dimensional medium of the interference pattern formed when a point source of light (the reference beam) of fixed wavelength encounters light of the same fixed wavelength arriving from an object (the object beam). Ordinary light is made up of many different wavelengths, none of which maintains a fixed phase relationship with each other or with themselves over a period of time. It has poor temporal coherence. Such incoherent light is not capable of interfering with itself, which is the most important for the application of holography. So lasers are used to produce light beams which are coherent over 10^10 wavelengths and more. • Interference: It is a phenomenon in which two waves superpose to form a

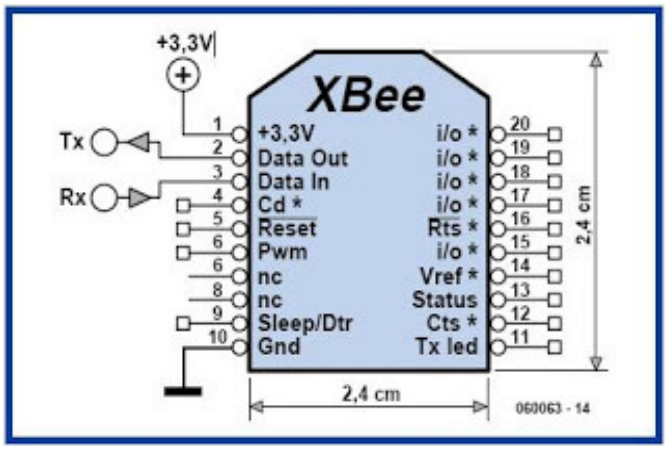
resultant wave of greater or lower amplitude. Interference usually refers to the waves that are coherent with each other. • Diffraction grating: The recorded light pattern is diffraction grating. When it is illuminated by only one of the waves used to create it, it can be shown that one of the diffracted waves emerges at the same angle at which the second wave was originally incident so that the second wave has been reconstructed. Thus, the recorded light pattern is a holographic recording. Photographic plate: Only records the intensities.

creating holograms we need, 1) Laser 2) Beam splitter 3) Photographic plate or Hologram plate 4) Mirror It involves two processes: a) Recording a Hologram b) Reconstructing a Hologram A coherent light from a Laser is directed on a Beam Splitter. A Beam-Splitter divides the laser beam into two identical beams, which are aimed in two different directions. The two beams are Object beam and Reference beam. The object beam is reflected by the surface of the object onto the plate. The reference beam directly falls onto the plate. So the laser beams interfere with each other. A laser light hologram is recorded To capture the three-dimensionality of an object, the film stores not only the amplitude but also the phase of the light rays. This recorded interference pattern actually contains much more information that a focused image, and enables the viewer to view a true three-dimensional image which exhibits parallax.



ZIGBEE:

ZigBee is a specification for a suite of high-level communication protocols used to create personal area networks built from small, low-power digital radios. ZigBee is based on an IEEE 802.15.4 standard. Though its low power consumption limits transmission distances to 10–100 meters line-of-sight, depending on power output and environmental characteristics,[1] ZigBee devices can transmit data over long distances by passing data through a mesh network of intermediate devices to reach more distant ones. ZigBee is typically used in low data rate applications that require long battery life and secure networking (ZigBee networks are secured by 128 bit symmetric encryptionkeys.) ZigBee has a defined rate of 250 kbit/s, best suited for intermittent data transmissions from a sensor or input device. Applications include wireless light switches, electrical meters with in-home-displays, traffic management systems, and other consumer and industrial equipment that requires short-range low-rate wireless data transfer. The technology defined by the ZigBee specification is intended to be simpler and less expensive than other wireless personal area networks (WPANs), such as Bluetooth or Wi-Fi.



Zigbee protocol features include ;

- Support for multiple network topologies such as point-to-point, point-to-multipoint and mesh networks
- Low duty cycle – provides long battery life
- Low latency
- Direct Sequence Spread Spectrum (DSSS)
- Up to 65,000 nodes per network
- 128-bit AES encryption for secure data connections
- Collision avoidance, retries and acknowledgements

ZigBee Applications:

ZigBee enables broad-based deployment of wireless networks with low-cost, low-power solutions. It provides the ability to run for years on inexpensive batteries for a host of monitoring and control applications. Smart energy/smart grid, AMR (Automatic Meter Reading), lighting controls, building automation systems, tank monitoring, HVAC control, medical devices and fleet applications are just some of the many spaces where ZigBee technology is making significant advancements.

DIGI ZIGBEE TECHNOLOGY:

Digi is a member of the ZigBee Alliance and has developed a wide range of networking solutions based on the ZigBee protocol. XBee and XBee-PRO modules and other XBee-enabled devices provide an easy-to-implement solution that provides functionality to connect to a wide variety of devices.

CONCLUSION:

- We implemented the model within a framework that can be used for redirect food distribution within different virtual and physical environments.
- It is useful for the evaluation of redirected of parameters under varying conditions.
- In this paper, we using virtual reality due to light rays through the wall to display through the Buttons like FOOD, CLOTH, MEDICINE Etc.
- In future to be display long distance through the laser beam light.

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