IMPLEMENTATION OF REAL TIME HAND GESTURE FOR 3D HOLOGRAPHIC DISPLAY USING ARTIFICIAL INTELLIGENCE

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Keywords

3D Holograph, Artificial Intelligence, Light Diffraction, Projection.

Introduction:

Three-dimensional technology is defined as a system that works on displaying images or elements in a model that appears in the form of a particular structure so that its dimensions including height, width and depth are preserved. Holographic Projection is the latest advancement made in 3D technology. It enables users feel that the scene is simulating. 3D holograms are the projections that exist freely in space. The word Hologram includes two Greek terms, "holos" which means "Complete view" and "gram" which means "written". Holographic technology was discovered by Dennis Gabor in 1947 while working on advancement, research for electron micro-scopes and other related fields. But the technology was not completely described and came into effect until 1960's. 3D Holographic Technology (3DHT) was actually implemented in 1962.The 3D holographic projection is also known as "Musion Eyeliner". Holography is a way of producing unique photographic image in three-dimensional view of the object unlike the traditional 2D view. The projected image can be viewed without any lens or spectacles. The method of recording and duplicating genuine three- dimensional pictures of objects utilizing the rule of interference. Owing to the recent trends in 3D display and the level of realism, multiple technologies have come up to deliver a convincing 3D viewing experience. The 3D pictures utilizing focal point shown nowadays will before long be a thing of past. Presently, with the approach of visualizations rehashing the show highlights that direct the way for different key applications, promoting, political and therapeutic purposes. Hologram projectors, render 3D projections whether its inside a glass tube or suspended in thin air. 3D images enable users to interact with content from a 360-degree viewing point. The system produces holographic projections created from picture by refraction through the interference design, without losing any light, working with more productivity.

Objectives:

(a) To solve the problem of 2 - D single perspective Image by creating a multi perspective Image.

(b) To provide a wireless communication between the computer and the controller.

(c) To design a virtual 3 – Dimensional image that can be seen by naked eyes without the use of 3D Glasses.

(d) To create contactless input to the system by using hand gestures and process the output instantly.

Methodology:

The proposed system uses Raspberry Pi controller-based system to achieve holographic projections. Here, the Raspberry Pi controller is loaded with the recorded videos which are to be projected onto the display system through and the code, which controls the whole set up. It is interfaced with a microcontroller that processes the voltage levels of IR sensors and thus gives input to the Raspberry Pi and required gesture is acted upon.
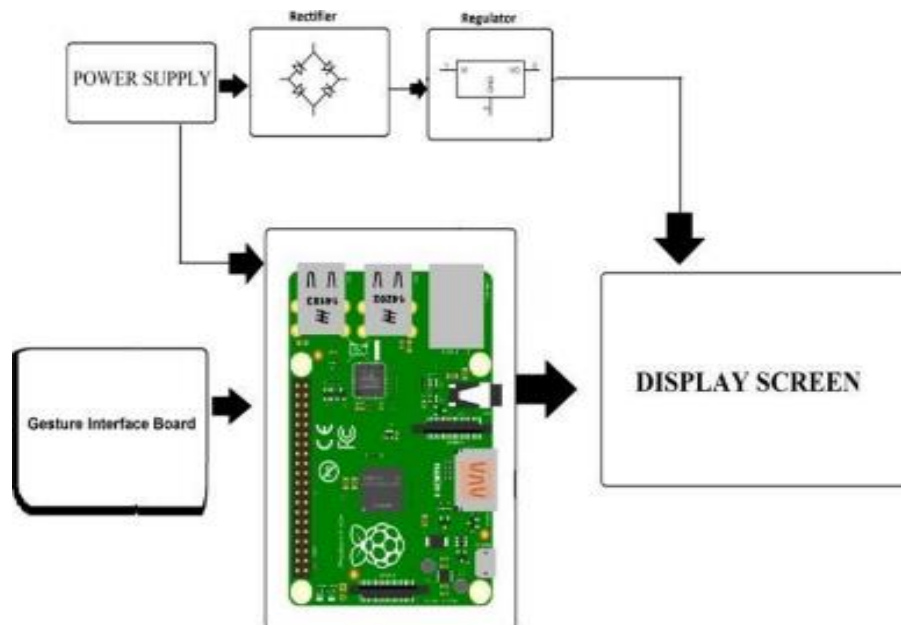
A Gesture sensing board for Raspberry Pi to detect the gesture input provided by user and then use it to go forward or rewind to previous projections without even touching the panel. The power supply unit is designed such that it is connected to both the Raspberry Pi board and the Gesture Interface board simultaneously, both circuits are provided with different voltage and power requirements. The Raspberry pi board works at 2.5A5V. The peak power consumption of the Raspberry Pi 3 under heavy load is about twice that of the Raspberry Pi 2 (750mA vs 360mA). The power supply unit consists of a bridge rectifier, capacitive filters and voltage regulators (LM7805). All the dams will have base stations like these which gather data and transmit data to the cloud. So, the command centre has the real time data of all the dams across the country.

Results and Conclusions:
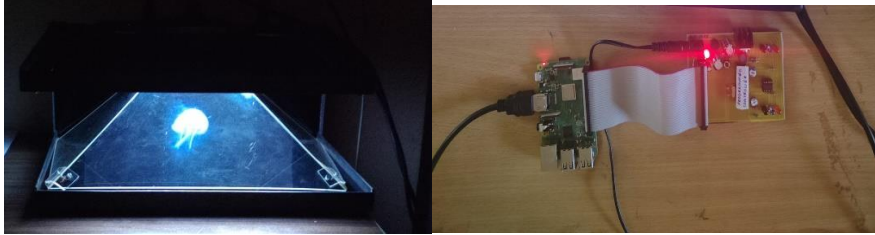
The above figure shows the prototype model of the proposed idea. 3D holographic projection is the technology that can record and reproduce objects in real 3D by using interference and diffraction theory. The initial step is to capture the object light wave pattern information by light interference principle, capturing process: the object or image under source radiation forms a some diffuse pattern for object/image; another part of the source as a reference beam shines on the holographic display, and the image beam is superimposed and produce interference, converts the phase and amplitude of object's image light waves to the intensity in space changes, thus captures and records all the information of the image light waves by using contrast and spacing in interference patterns. The film, recording the interference pattern, after developing and fixing projection display, a hologram or holographic image will form. The next step is by diffraction theory which reproduces the image light wave information, which is the imaging process, the hologram is like a complex interference pattern, in coherent source.

The image of reproduction has the strong three-dimensional feature and a effective visual effect. Evert part of the hologram will capture the light of the image, so in principle, every part can reproduce the original image, a number of different images can be captured on a film by multiple-exposure and showed each other without disturbing. In projection model of holography, A four-sided reflective transparent fibre pyramid is used whose size can vary according to projection model, application and need. A screen, like mobile or laptop is used to run the desired processed video on.

Scope for Future Work:

The proposed system can be enhanced in the future for different applications. It has the potential to dramatically improve training, design, and visualization in many business settings and production facilities. Geographic insights is basic to military technique. Completely dimensional holographic pictures are being utilized for moved forward surveillance. Though holograms create fascinating imagery, it doesn't just have to record and present a visual object. 3D images are capable of recording immaculate information - mountains of it. Visualization has the potential to store absurd amounts of information. Holography is on its way to revolutionizing medicine. It can be a device for visualizing quiet information in preparing under studies and specialists. Since 3d images are complex and difficult to form, this makes them an extraordinary advantage in commercial security. Credit cards have built in holograph for security purposes. Artists began experimenting with holography the moment it became a practical process. There are specialists around the globe utilizing the three-dimensional images to twist and cut space, combine collections of still pictures or video to create enlivened 3D Works and to shape immaculate light. Specialists started testing with holography the minute it got to be a viable process. There are craftsmen around the globe utilizing the three-dimensional of visualizations to twist and cut space, combine collections of still images or video to produce animated 3D Works and to sculpt pure light.