

“HOLOGRAPHIC 3D DISPLAY”
AN AUTOSTREOGRAPHIC DISPLAY SYSTEM
(A NEW ECONOMICAL AND COST EFFECTIVE
APPROACH IN HOLOGRAPHIC DISPLAY TECHNOLOGY)

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Introduction:

The project examines the new technology of Holographic Projection. It highlights the importance and need of this technology and how it represents the new wave in the future of display technology, the different application of the technology and the fields of life it will dramatically affect including business, education, telecommunication and healthcare. The paper also discusses the future of holographic technology and how it will prevail in the coming years highlighting how it will also affect and reshape many other fields of life, technologies and businesses.

Holography is a technique which enables three-dimensional images (holograms) to be made. It involves the use of a laser, interference, diffraction, light intensity recording and suitable illumination of the recording. The image changes as the position and orientation of the viewing system changes in exactly the same way as if the object were still present, thus making the image appear three-dimensional.

The idea originated by the inspirational fiction technology used in the latest Hollywood movies (ex: Iron man), where the man uses his voice commands and basic hand gestures to communicate with the machine. The proposed project realizes the fiction of 3D projection and visualizing it without the aid of any goggles. Only holography allows the reconstruction of natural-looking 3-D scenes, and therefore provides observers with a completely comfortable viewing experience. But to date several challenges have prevented the technology from becoming commercialized. But those obstacles are now starting to be overcome.

This idea was invented accidentally, with the basics of Physical Optics. The similar enhancements are available for iPad/iPhone. This inspired us in précising the idea and inventing this new product, which is versatile in its application and uses. The ready available 3D holography enhancements are costly. The proposed idea will serve the students and middle class individuals as an effective yet economical gadget in their application.

Objectives:Holographic 3D Display System is an innovative technology of display system. It can be used to demonstrate or display 3D videos or images which can be viewed without the aid of any spectacles. This technology will give a better solution by providing 3D perspective of the designed CAD models and Simulation of 3D models (Automobile designing, Semiconductor devices, Idols etc.) It can also be used for presentations and entertainment applications for effective experiences. Holographic display is the latest hype in the display technology. Making it cost effective is a big challenge for the manufacturers. The proposed product is a low cost, no requirement of 3D glasses, requires no medium to display (air/fog/smoke) yet effective.

- Understanding a 3D CAD design in a 2D plane is difficult and time consuming, the proposed product solves the problem of interpreting the 3D models in 2D plane.
- Simulating and analysing the 3D designs will be handy with this type of display.
- Computer Aided Designing of products (such as Automobile, Robotics, Semiconductor devices, Nano technology products etc.) will be made simple.
- In entertainment sector, the product finds its position in the top place. It can be used in advanced advertisement displays and mass addressing.

Methodology:The device constitutes of an inverted pyramid of a transparent plastic sheet, which has 4 display portions in the monitor orthogonal at its tip. Each portion of the monitor displays the respective perspective of the image/video. The light from the monitor reflects back to the viewer, since the sheet is slant, the image appears to be in the middle of the pyramid. The viewer sitting in front can see the front view of the object and the person at the right side can see the right part of the object (similarly back and left side). Physical Optics is the only basics of the product. Total Internal Reflection is the principle of working.

No smart classes use this type of display device to demonstrate the 3D models in schools. Extending to that the Labs and Research centres also does not have such display environment. The end product is a new type of 3D Display device which requires no extra goggles to view, imbibing basic principle of physical optics yet technologically innovative and economical. Human Interactive 3D Display System is an innovative technology of display system. It can be used to demonstrate or display 3D videos or images which can be viewed without the aid of any spectacles.

Results and Conclusions: The end product is a new type of 3D Display device which requires no extra goggles to view, imbibing basic principle of physical optics yet technologically innovative and economical.

Holography may still be in its infant stage, but its potentials applications are aspiring. Holographic Technology and Spectral Imagining has endless applications, as far as the human mind can imagine. Holography being the closest display technology to our real environment may just be the right substitute when reality fails. Knowledge sharing and mobility will only cost a second and learning will become more captivating and interactive. First, there is an urgent need to address the infrastructural deficiencies limiting the application of holography in education. More interestingly, the display medium of holography is very important. A 360 viewing angle is especially what is needed to maximize the use of holography in education. Being able to display a 3D hologram in free air is also vital, because interacting with holograms in a covered display may be cumbersome. In order not to limit the use of holography to a non-interactive display medium, incorporation with feedback technologies is mandatory.

Potential Users:-

- Students and Scholars in engineering stream and research fields.
- Rural area students can understand the concepts and topics easily.
- Carving and Crafting at Rural industries would be more efficient with previewing of the designs.
- Entrepreneurs and Innovators can use the product to demonstrate their ideas and innovation in an effective manner.
- Science labs in Schools and Colleges for giving 3D demonstration of objects.
- Research Laboratories can use the product to analyze and simulate the designs of complicated designs.
- Automobile Industries uses the product for 3D model analysis of the automotive parts and body design.
- The idea will be efficiently applicable in Flight Simulation Facilities.
- Defense and Research facilities can use the device for the missile and armor demonstration.
- 3D Radars can be implemented with the end product.

Scope for future work: 3D holographic projection technology clearly has a big future ahead. As this audio visual display continues to get high profile credibility, we are likely to see more companies advertising their products or marketing their business in this way. Whether it be large scale, big budget product launches or smaller retail POS systems, they are likely to become a common feature in the advertising world. The holographic projectors that are under development will be able to be much smaller and portable than image projectors that rely on conventional, incoherent light beams. Ultimately, holographic projectors may become sufficiently small to be incorporated into future generation cell phones. Holographic techniques are being used for three dimensional (3-D) rendering of medical pictures including MRI and CT pictures. Medical holo-technology imaging can enable doctors to test the insertion of medical instruments into an artificially constructed, three-dimensional version of the surgical field before the operation. An array of micro- mirrors, whose movements are controlled by computer, may be used to divide and focus an array of laser beams to make moving, three-dimensional holographic pictures of internal anatomic features.

Holographic projectors will be able to render sharp projected images from relatively small projection devices (e.g. cell-phones) because they do not require high intensity, high-temperature light sources. Investigators at companies and universities are working toward applied science that could make television with holographic projections (holo-visions) that can project moving, three-dimensional pictures outside of the screen.

Holographic applied science can also create new methods for three- dimensional visual contact from computing systems to human beings. This starts with screen displays with improved 3D projection qualities and then improves to mid-air, three- dimensional computer