Visualization of Global Environmental Problems using Augmented Reality

Dhanashri Ganpat Kamble, Prof. Flavia Gonsalves

MET Institute of Computer Science,
Bandra West, Mumbai, India

Abstract : Life on earth sustains with consistent changes. Each and every natural material in this world is continually evolving. Over the timeframe, industrialization has prompted different ecological issues faced by each living being on our planet. The biggest challenge for mankind revolves around the environment and the health of the planet. The globe's condition is getting influenced via carbon dioxide outflow brought about by deforestation alongside expanding ocean levels. The lack of open consciousness of the risks of a dangerous atmospheric deviation causing antagonistic effect on nature, for example, the liquefying of polar ice caps, rising ocean levels and other events that undermine human life. Augmented Reality is a new age technology, a seed of technological advancement. It coordinates a virtual world into the present reality. This paper focus on increasing awareness among people using augmented reality technology and how AR innovation can spread mindfulness among the individuals on ecological issues. Marker technology and virtual buttons helps making an actual existence like visual scene.

Keywords : Augmented Reality, Global Environment issues, Virtual Buttons, Public awareness

1. INTRODUCTION

Augmented Reality (AR) is considered as the most crucial innovative technology. Numerous explores are as yet under advancement to reveal the full limit of this innovation. Natural issues have its inconspicuous conjunction with people on our planet. Major ecological issues to be engaged in this paper are the impacts of global warming and deforestation. Both these issues needs prompt consideration as in close by future they have a danger to human presence.

Global Warming

Global warming is an urgent natural threat and requests exceptional consideration. Global warming is the long-term warming of earth's atmosphere framework because of human activities, basically petroleum product consuming, which builds heat-catching ozone harming substance levels in earth's environment. The extent of GHGs (Greenhouse Gases) in the climate increments altogether every year, in this way the impacts of global warming will keep on expanding, with potential to be truly malicious in the not very far future.

Deforestation

Deforestation is an essential contributor of environmental change. Land use changes, particularly as deforestation, are the second biggest anthropogenic source of air carbon dioxide discharges, after fossil fuel burning. Deforestation can be caused by land clearing, wildfire, animals farming, and logging for wood. Because of deforestation, creatures regularly lose their environments and

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vegetation is essentially diminished. Natural surroundings misfortune is normal when deforestation happens on the grounds that not exclusively are the trees being chopped down, however the land trees already repressed endure extraordinary soil disintegration because of absence of assurance from the tree coverage.

Augmented Reality(AR)

Augmented Reality is a medium where data is added to the physical world in enrolment with the world. AR permits the overlay of computerized data on the physical world. The computerized data can be absolutely synthetic, for example, from computer stimulation, or can be duplicates of certifiable data represented digitally. A significant part of AR is that you "stay" in the physical world, that is, there isn't an endeavour to cause you to trust you are not in reality. The computerized data is added to, or superimposed on the physical world.

AKT is the most commonly used marker. AKT refers to the fiducial markers used in ARToolKit. ARToolKit is a popular planar marker system for Augmented Reality and Human Computer Interaction (HCI) systems. The bitonal markers comprise of a square dark fringe and a pattern in the inside as shown in figure 1. The principal phase of the acknowledgment procedure is finding the markers' dark border, which is finding associated pixels underneath a certain grey value limit. At that point the shape of each gathering is extracted, and at last those gatherings encompassed by four straight lines are set apart as possible markers.

AR intends to assist users with movement in a true environment. To show virtual content in a real situation consistently, a marker is expected to distinguish and situate the assigned designs. A picture outline is caught through a video device. The captured picture is then binarized and a marker design is found and coordinated with the enlisted markers in the database. When an enrolled marker is distinguished, the framework will find the 3D coordinates of the marker pattern and spot the relating virtual item on it.

Fig.1 Example of a marker

2. LITERATURE REVIEW

Malinka Ivanova and Georgi Ivanov [Ivanova & Ivanov, 2011] did fundamental investigation of AR technology for teaching and learning upgrade. They stated, summarized and broke down a few advantages by means of a model. A minimal effort intelligent condition including AR innovation for instructing and learning improvement is introduced. The aftereffects of the contextual analysis show the positive assessment of understudies about the future use of marker AR innovation.

K.R. Parvathy and Rao R. Bhavani paper's [K.R. Parvathy, et al., 2016] investigation shows the utilization of numerous marker. Augmented Reality as an instructive device to show a significant

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socio-logical issue. AR-based demonstrating is a more fruitful showing apparatus than video based displaying by examining an overview survey.

Ihsan Rabbi, Sehat Ullah [Ihsan & Sehat, 2013] study paper introduced an exhaustive survey of various tracking frameworks and arranged the difficulties in the field of augmented reality. The difficulties in augmented reality and tracking techniques are too explained altogether.

3. RESEARCH OBJECTIVE

The fundamental objective of this paper is making mindfulness about issues of environment, for instance, an Earth-wide temperature lift and deforestation by using AR development. Individuals will possibly improve their ability to choose better instructed decisions about examinations with respect to such noteworthy current issues. As of not long ago, moderately little has been done in this field, which makes doing this sort of work of specific significance. At present the ecological dangers are commonly passed on with the assistance of 2 dimensional media's such as video recordings and pictures. In any case, frequently these media don't give the full effect of the unfavourable impact of these threats in view of the restrictions of 2 dimensional media. Utilizing life-like visuals of AR, the people will in general be progressively mindful, consequently expanding their capability to hold the received data.

4. PROPOSED SOLUTION

The proposed framework offers awareness to individuals about the effect of worldwide warming and deforestation. AR being an alternate innovation most of the individuals will have distinct fascination to think about it.

Marker technology is utilized to identify various objects. One of a kind markers are utilized to show each unique item. For instance, to show the image of earth and trees, a specific different marker are utilized. For each item every marker is utilized. For instance, one marker is utilized for the earth model and another is utilized for the tree model.

When utilizing this technique, it is simple for the individuals to know the reasons for an earth-wide temperature boost and deforestation, the explanations for why the earth is getting warmed up, the impacts of an environment threats. This assists with acquiring acknowledgment individuals that these are brought about by their human activities and they will attempt to diminish these hurtful exercises which cause a worldwide temperature alteration.

Vuforia is the software platform that empowers the most incredible and most creative perceived augmented reality application. Image targets represents images that Vuforia Engine can distinguish and track.The engine distinguishes and tracks the picture by contrasting separated regular highlights from the camera picture against a known objective asset database.

When the image target is identified, Vuforia Engine will follow the picture and augment the items flawlessly utilizing best in image tracking. Virtual buttons summons intuitiveness for your image targets proceeding onward screen associations to the reality. Virtual buttons give a helpful instrument for making image based targets interactive.

In Augmented Reality, contents are taken cover behind the marker. The webcam associated with PC catches the "marker" peruses the design encoded in it and sends this data to the PC. The data is being perceived and the marker is supplanted with a picture encoded in it. The development of the marker is being tracked by the PC and modifies the size of the picture as indicated by the movement.

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The framework catches and recognizes the target image (marker) and renders the genuine item (3D objects, graphics) on top of the objective picture and shows it. At the point when the objective picture is presented to the camera, the camera catches and distinguishes the picture. And afterward the picture is being followed and compare against picture in the database. When the tracked picture is distinguished in the database, it renders the genuine item relating to the objective picture.

In the proposed system, the image target is plain grey coloured card paper with two circular shapes. The yellow circle serves as a marker for the sun and the blue-green circle represents the planet earth along with a virtual button for triggering action.

The following is pictorial representation depicting the global temperature boost of earth
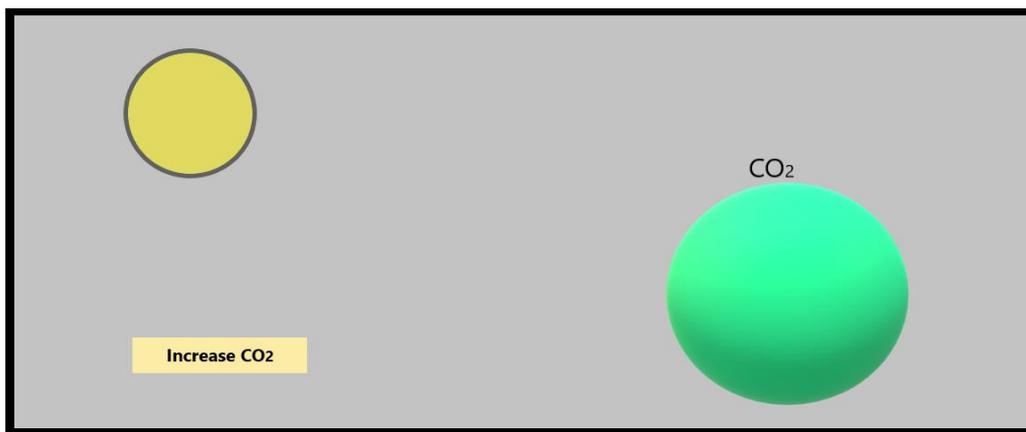
Fig.2 Pictorial Representation of global warming effect

To demonstrate deforestation effects, a green textured card paper is used. The concept is to represent how due to mass clearing of trees the environment is getting affected.

For this purpose, various markers can be used. As shown in below pictorial representation of deforestation, the green hemisphere serves as marker for tree model while the black bordered diamond indicates a human in attempt to chop trees. A virtual button is placed for tree cutting action.
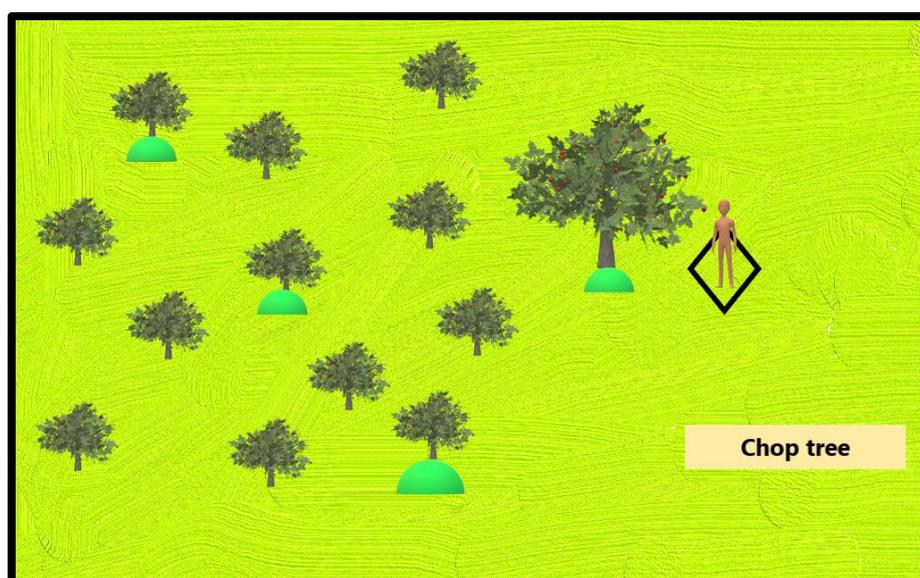
Fig.3 Pictorial Representation of deforestation effect

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5. RESULTS

The proposed work gives an sway upon the mankind as how much viably the innovation of augmented reality can be utilized in the social mindfulness. The proposed framework is valuable for illumination on social purpose. The system will commmence theoretical reasoning and getting increasingly conspicuous sentiment of biological space and ecology in the population.

6. CONCLUSION

Augmented Reality is the virtual fantasy of object. It just gives a layer of data onto the current physical world so individuals can see more than ordinary vision. From the business viewpoint, however it will likewise tremendously affect our social, ecological, financial and political matters. Despite some related issues, it will be generally executed all over the world. It will recreate human interaction with environment. It is currently a long ways past of creative mind as how might the augmented reality shape our future. This innovation fuses the utilization of markers and virtual buttons that cooperate with one another giving an actual existence like sense of direct understanding to the common people. This paper describes a new way to demonstrate effects of global environmental problems and create awareness among people regarding the earth's atmosphere.

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