



A Survey on Safe Transfer of Dynamic Defence Attack Strategy and its 3D Representation Using Augmented Reality

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ABSTRACT: The project implements the use of a wearable computer system to visualize an attack by the armed forces on the enemy during wars using augmented reality. By using a simple webcam and Computer Vision techniques, we turn a standard real plan on paper/board into an AR plan. We use the objects as a tangible interface, and augment them with visual effects. This results in a better immersion compared to the original board/paper plan and provides a different experience. Our approach is therefore to adopt the same setup as Eye of Judgement, a camera pointing to the board, and the augmented scene visible on a computer screen. We demonstrate our approach on a small board, but it is very generic and could easily be adapted to many other fields like live board game, Visualize Architecture Designs in an Outdoor Environment.

KEYWORDS: Marker, 3D Model, Augment, Augmented Reality

I. INTRODUCTION

Video games are entertaining us for nearly 25-30 years ever since Pong came into picture in the early 1970s. Computer graphics have improved a lot since then, and game graphics are pushing the barriers of photorealism. Now the attempt of engineers and researchers is to pull graphics out of your TV screen or display of computer and combining or integrating them into real world environment. This new technology is augmented reality.

Augmented Reality is overlapping of real world with a virtual world. In other words we can say augmented reality is changing the way we view the world. AR presents a 3D view of the real world objects digitally. It is a technology that overlaps a PC generated image on a user's view of world, thus providing a different view. In real world Augmented Reality is integration of digital information with the user's environment. Virtual reality create totally artificial environment but augmented reality uses the existing environment and laminates new information on top of it.

The problem of	Planning an attack strategy
Affects	Armed forces have been struggling to design the efficient attack strategy for attack and defense during war. The paper plan method does not give the actual or real environment of the war area and is also time consuming.
The impact of which is	A lot of time is invested in the traditional method of planning the strategy on paper. And also the things are a lot different from what planned on paper. So the implementation is difficult.
A successful solution would be	Providing a real time environment view of the area using AR.

Table No.: 1

Augmented Reality has not been used by the Indian Armed Forces yet but it can prove to be beneficial for planning the war strategy which is done on paper. AR helps to present the plan in more understandable way than just presenting

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it on paper and also it is more secure as the plan can be only augmented on an image called marker image. So even if someone secretly gets the app, he cannot augment unless he gets the marker image.

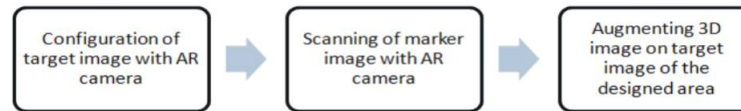


Fig. No.: 1

II. RELATED WORK

In 2010, Christchurch was hit by an earthquake of magnitude 7.1, damaging and destroying over 6,000 buildings and damages of an estimate \$4 Billion. Many buildings will need to be demolished and it will be years before reconstruction is complete. Many buildings need to be repaired and newly constructed which will take years to complete.

AR was used in this field for viewing the reconstructed buildings. An Earthquake AR was created which also helped in viewing the earthquake related information. It is based on HIT Lab NZ Android AR platform it allows users to view virtual buildings augmented on the real world with an Android mobile camera.

Using this Earthquake AR, people can go through the city and see the real buildings in place of the demolished ones virtually. It shows the original model as well as suggests the new designs for it.

Tokyo Institute of Technology has a team who is working on a system that could be integrated into stoves to help people learn to cook. There's definitely more than meets the eye with this concept. The pan can actually simulate the weight of the food as well interaction with it (flipping a steak over, for example). It also can read temperatures, which allows it to simulate cooking. All this information is used to create a realistic AR immersion of cooking your meal. Burnt food may be a thing of the past, with everyone being able to do dry runs of a new meal before taking on the challenge.

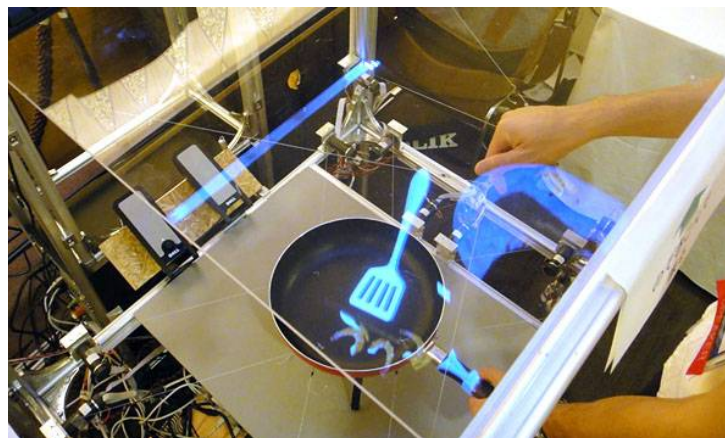


Fig. No.: 2

GPS has become so widespread that most people couldn't live without it. One annoying aspect is that you generally have to take your eyes off the road to see the directions, along with turn-by-turn directions being difficult to line up to the actual road at times. Mishor 3D is currently working on 3D navigation driver's aid to solve that.

While I doubt an app is going to be able to tap into police blotters or the DMV anytime soon to provide the information presented here, navigation overlays would be extremely useful. Combined with crowdsourced traffic apps like Waze and Inrix this could be a power aid to drivers. The biggest hurdle for these types of apps may end up being less

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technical and more design. If they clutter the interface too much, it would prove a detriment to drivers instead of a benefit.



Fig. No. 3

III. PROPOSED SYSTEM

In the proposed system of “Safe transfer of defence attack strategy representation using augmented reality” we are presenting a 3D model of the war area through AR. The proposed system proposes a model based on AR for designing of environment of war area using UNITY 3D. The system will consist of different objects like aeroplane, tanks, bunkers, soldiers and the area representation along with the contours. If there is any change in the positioning of any of the object, it can be done dynamically without the interference of the developer and by the user itself. Also, in one single application, multiple war strategies mapped with multiple markers will be incorporated. The system will address the challenges such as designing of area and placing of armies over the area, movement of army troops. This system will add security parameter over the traditional pen and paper method. To add more security, an additional feature will be added, which will ask for a security entity to be proved and then and then only the marker will augment the war area over the marker.

Architecture -

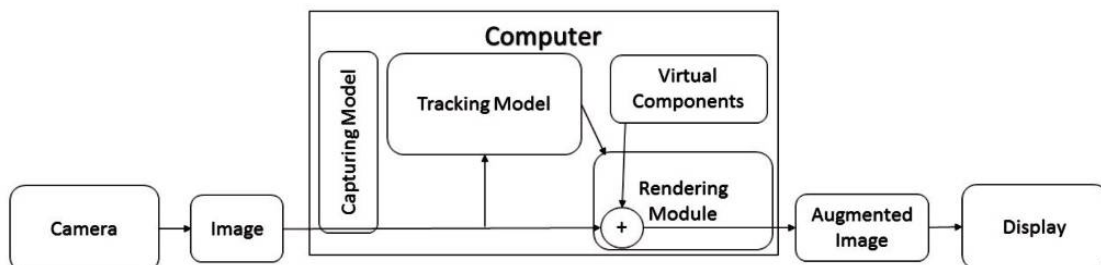


Fig. No.: 4

Capturing module-

This module is used for recognising marker. It uses marker detection algorithms to recognise the marker efficiently. It detects the marker on the basis of line detection and quadrangle detection.

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Tracking module-

Here the tracking of movements of the camera with respect to the marker is done and mapped with the augmented image.

Virtual components-

This module is actually used for the augmentation of the target image on the marker in the augmented camera. The size of the augmented image is decided with respect to the marker.

Rendering module-

Here both tracking module and the module of virtual components are combined to show the movements of the virtual components.

Expected output –

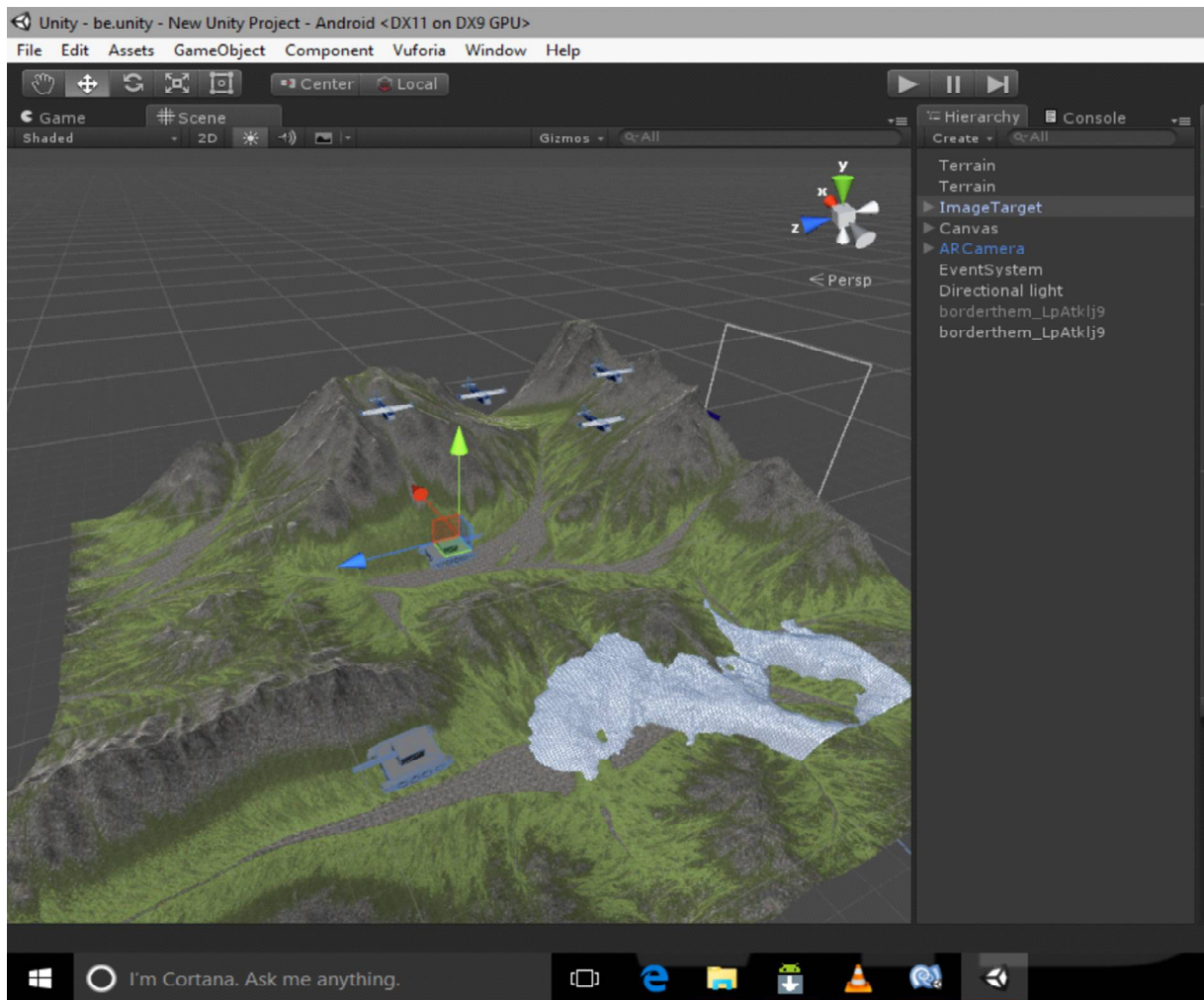


Fig. No.: 3



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HIGHLIGHTS OF OUR SYSTEM

Dynamic Application	Change of positions of objects dynamically in real time without changing the backend.
User Interface	Interactive and user friendly UI to help the end user understand the application easily.
Algorithms	1-Touch Interface. 2-Keyboard Interface. 3-Mouse Interface.
Remote Access	Running the application in another device by using data cable or wifi.
Security Feature	Using touch interface for authentication.

Table No.: 2

IV. CONCLUSION

It can be safely stated that, while there are many systems for Augmented Reality, no system particularly emphasizes on Defence attack strategy. By animating different objects, Augmented Reality can make this method more popular and feasible as the traditional way of planning an attack strategy is a paper pen method which doesn't provide the security as well as the proper view or feel of the war area cannot be provided through it which Augmented Reality does.

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