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AUGUMENTED REALITY

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Abstract: Augmented Reality (AR) is a growing area in virtual reality research. The environment around us provides a wealth of information that is difficult to duplicate in a computer. This is evidenced by the worlds used in virtual environments. Either these worlds are very simplistic such as the environments created for immersive entertainment and games, or the system that can create a more realist environment has a million dollar price tag such as flight simulators. An augmented reality system generates a composite view for the user. It is a combination of the real scene viewed by the user and a virtual scene generated by the computer that augments the scene with additional information. In all those applications the augmented reality presented to the user enhances that person's performance in and perception of the world. The ultimate goal is to create a system such that the user cannot tell the difference between the real world and the virtual augmentation of it. It depicts the merging and correct registration of data from a pre-operative imaging study onto the patient's head. Providing this view to a surgeon in the operating theater would enhance their performance and possibly eliminate the need for any other calibration fixtures during the procedure.

Keywords: Augumented Reality, 3D Graphics, Hardwares,Robot

I.INTRODUCTION

The process of superimposing digitally rendered images onto our real-world surroundings, a sense of an illusion or virtual reality. Recent developments have made this technology accessible using a Smartphone.

How is it used?
Augmented reality is hidden content, most commonly hidden behind marker images, that can be included in printed and film media, as long as the marker is displayed for a suitable length of time, in a steady position for an application to identify and analyze it. Depending on the content,the marker may have to remain visible.It is used more recently by advertisers where it popular to create a 3D render of a product,as a car, or football boot, and trigger this as an overlay to a marker. This allows the consumer to see a 360 degree image (more or less, sometimes the base of the item can be tricky to view) of the product. Depending on the quality of the augmentation, this can go as far as indicating the approximate size of the item, and allow the consumer to 'wear' the item, as viewed through their phone.

Alternative setups include printing out a marker and holding it before a webcam attached to a computer. The image of the marker and the background as seen by the webcam is shown on screen, enabling the consumer to place the marker on places such as the forehead (to create a mask) or move the marker to control a character in a game.

Main Classes of Application:

- Medical
- Manufacturing and repair
- Annotation and visualization
- Robot path plan.

II.IMPLEMENTATION FRAMEWORK

Hardware: The main components of our system are a computer (with 3D graphics acceleration), a GPS system originally differential GPS, and now real-time kinematic GPS+GLONASS, a see-through head-worn display with orientation tracker, and a wireless network all attached to the backpack.

The user also holds a small stylus-operated computer that can talk to the backpack computer the spread spectrum radio channel. Thus we can control the material presented on the head wom display from the handheld screen.

We also provide a more direct control mechanism of a cursor in the head worn display by mounting a track pad on the back of the handheld display where it can easily be manipulated (we inverted the horizontal axis) while holding the display upright. To make the system to be as lightweight and comfortable as possible, off-the-shelf hardware can be used to avoid the expense, effort, and time involved in building our own. Over the years, lighter and faster battery-powered computers with 3D graphics cards, and finally graduated to laptops with 3D graphics processors.

Software: Software infrastructure Coterie, a prototyping environment that provided language-level support for distributed virtual environments. The main mobile AR application ran on the backpack computer and received continuous input from the GPS system, the orientation head

tracker, and the track pad (mounted on the back of the handheld computer). It generated and displayed at an interactive frame rate the overlaid 3D graphics and user interface components on the head worn display.

In the handheld computer we ran arbitrary applications that talked to the main backpack application via Coterie/Repo objects communications. In our first prototype, we simply ran a custom HTTP server and a web browser on the handheld computer, intercepted all URL requests and link selections, and thus established a two-way communication channel between the backpack and the handheld.

Advantages of AR:

- ✓ Can increase knowledge and information
- ✓ People can share experiences with each other in real time over long distances
- ✓ Games that provide an even more "real" experience.

Disadvantages of AR:

- ✓ Spam and Security
- ✓ Social and Real-Time vs. Solitary and Cached
- ✓ UX (User Experience): Using AR can be inappropriate in social situations.
- ✓ Interoperability: The lack of data portability between AR environments .
- ✓ Openness: Other people can develop

III. CONCLUSION

Augmented reality is another step further into the digital age as we will soon see our environments change dynamically.

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