Demo

Natural Interface and Overreaction for VR Entertainment.

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Abstract
With the widespread use of inexpensive VR devices, many VR events for entertainment started to be organized all over the world. An important point when many people experience VR content is easily engage the experience without losing too much time to understand how the interaction between users and virtual world is designed. Thus, it is very important to think of simple and intuitive interfaces. We aimed for a more intuitive interaction, and we replaced the hand controller with the CG models of hands by Leap Motion. *In this demonstration, we can highlight the difference in interacting through hand controllers and directly without the intrusion of any tangible device.*

Categories and Subject Descriptors (according to ACM CCS): H.5.2 [User Interfaces]: Interaction styles—User-centered design
I.3.7 [Computer Graphics]: Three-Dimensional Graphics and Realism—Virtual Reality

CCS Concepts
• *Computing methodologies* → *Collision detection;* • *Hardware* → *Sensors and actuators; PCB design and layout;*

1. The scenario (what the user will experience)

The demonstration is composed of specific VR experiences designed for the event with one specific goal: to explore the way people experience the virtual content through the use of different ways of interacting with it.

Our aim is to compare different interfaces: a hand controller and a system able to read users' hand gestures. Firstly, we designed a VR game where the users can interact with the content through the use of HTC VIVE. Secondly, we replaced the original hand controller with a more natural control based on *Leap Motion* attached on HTC VIVE which is able read the hand gestures of the user (Figure 1, 2). We call this system "Natural Interface". In our experiments, many experienced people found interacting with the digital world much more natural when they used directly their own hands thanks to our system than when they were using the original controllers.

Our demonstration aims to highlight how the appreciation of the VR experience is achieved in a better way when the users are able to use their own "natural" body directly without the use of controllers [LN15, Ihd90, FLN*18]. We can also understand how the experiencing person feels the VR scene and how he adapts himself to the scene by moving their bodies.

2. The story of the VR demo contents

This specific VR experience has been designed to use the possibilities provided by VR to explore completely new different worlds by

Figure 1: *Comparison*

introducing improbable objects in it [Kru91]. Cookies and snacks as tall as human beings are placed in the VR world. When they are knocked down with the hand controller or with the hand gesture, they fall down one after another like dominos. Even if it is a basic setting, it is perceived as an engaging experience once in the VR world (Figure 3).

Figure 2: *Leap Motion on HTC VIVE*

Figure 3: *Snack Cookies Domino*

3. The technology and techniques involved

For this demonstration, we added a function which allows users to instantly switch between different controls in order to experience the difference in the interaction. The user is led to change the way of triggering from using the hand controller to the use of the virtual hand controlled by the *Leap Motion*. This switch is shown only on PC display, and it is not visible on the HMD.
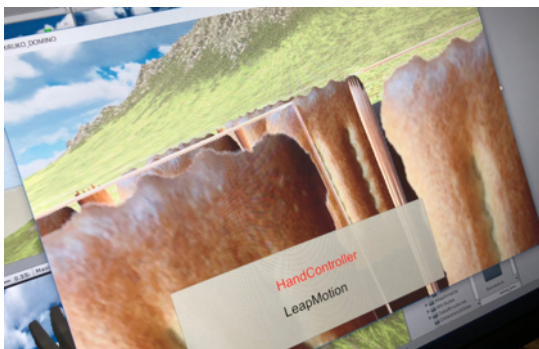

Figure 4: *The selection for hand controller or VR hands*

4. Watching users' reaction

A first version of the snack-domino VR experience has no story accompanying the game. Once the snacks are knocked down the experience ends. We designed also a second version of the game with a longer narration: after all the snacks falls like dominoes, three new snacks approach the user like planes from a distance with a low-altitude flight. These new snacks approach the user at high speed and a "danger" warning is visualized on the HDM. The snacks are programmed to fly over the user three times in total.

Since such an event is impossible in everyday life, it is difficult for the users to understand what is going on in the virtual space, but the staff who are supervising the game provide an explanation after which the users get to understand the VR production.

Figure 5: *The counterattacks of the snacks*

5. Future research to our entertainments

We found users found interacting with the digital objects with our system much more appealing and direct than hands controller. The use of a controller forces the users to focus on "unnatural" ways of interacting, and it requires time to learn how to use the devices, while our hand controller allow them to interact with the digital objects as if they were real objects in front of them. We will further investigate the relationship between the operation interface in the VR space and the satisfaction level of the experiences person and plan to reflect it in content development in a large event.

References

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