IVE Interaction Paradigms: An Annotated Bibliography

By:

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Purpose: COMPUT 603 Demo

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1 Introduction

Begin here by stating the topic that you have sent as "assignment 1" and the purpose of this document. For example .... This document presents an annotation of some published work in the area of computer-human interaction with special focus on Immersive Virtual Environments (**IVE**).

2 Organization

This is an *optional* section. You can use it to explain how you have organized your entries and/or why you have chosen these particular references. Please Note how the order of the entries in BibTeXfile is **independent from the order of the final paper**. The bibliography *style* determines the ordering criteria.

References

[1] Eric A. Bier. Skitters and jacks: Interactive 3D positioning tools. In *Proc. Workshop on Interactive 3D Graphics*, pages 183–196. ACM Press, 1986.

This paper is ... *Insert Your Annotation here.*

[2] S. Feiner, B. MacIntyre, M. Haupt, and E. Solomon. Windows on the world: 2D windows for 3D augmented reality. In *Proc. UIST'93*, pages 145–155, 1993.

In this paper, the authors describe different means of using a 2D windowing techniques to implement 3D windows in an IVE. Menus (windows) are classified into three categories based on their association with the IVE. (1) The *worldfixed* menu is a set of menus that will always appear in the same exact position in the IVE. (2) *Object-fixed* menus are those that are associate with only one single object in the world. (3) The last category is the *view-fixed* menu which will always appear in the same position relative to the current user view. This menu classification provides a new perspective to the CHI problem in an IVE.

[3] F. P. Brook Jr. What's real about virtual reality. *IEEE Computer Graphics and Applications*, 19(6):16–27, Nov.-Dec. 1999.

This is a cool paper the author present etc. . . . *Insert Your Annotation here.*

[4] Jason Leigh and Thomas DeFanti et al.˙ A review of tele-immersive applications in the CAVE research network. In *Proceedings of IEEE VR '99*, Houston, TX, March 1999. `http://www.evl.uic.edu/paper/`.

This paper is . . . *Insert Your Annotation here.*

[5] Kurt Thearling, Barry Becker, and Dennis DeCosta. Visualizing data mining models. In *Proc. Integration of Data Mining and Data Visualization Workshop*, 1998.

Kurt Thearling et al. provide an excellent review of the most recent work in the arena of data visualization. Although the work is not intended for IVE applications, most of the ideas were instrumental in understanding some of the inherent difficulties in data visualization. For example, from this work it became evident to us that *orienteering* is one of the most important aspects in an IVE. This indicates that it is important to examine possible solutions to properly orient the user early in the project. Some of the ideas presented includes maintaining a grid that defines the three axes (x, y, z) and the notion of a companion menu that, when invoked, aids the user in locating and transporting themselves within the environment. The authors also emphasize the importance of "trusting the model." Trust here refers to the user's ability to comfortably rely on the methods provided to correctly interpret the visual presentation at hand.

[6] Akira Utsumi and Jun Ohya. Direct manipulation interface using multiple cameras for hand gesture recognition. *Third Asian Conference on Computer Vision - ACCV98*, 2:264–267, January 1998. Lecture Notes in Computer Science.

This paper presents an algorithm that employs an ellipsoidal palm model to extract position, posture and shape of a human hand. The input of the system is obtained from three cameras and then integrated to obtain the position of the hand. For the recognition subsystem, the best view is selected first based on the best shape obtained by each camera. A vertical slice

of the environment is obtained through only one of two "ceiling" cameras. The ceiling cameras are, naturally, on top of the hand at a $60 degrees$ from one another. The third camera is "roughly" at the same horizontal plane as the hand. Although the system presented here demonstrates a good degree of success in recognizing a set of predetermined gestures, this system is highly constrained similar to most vision systems. The following explains these constraints and why such an algorithm is not going to be successful in an immersive environment. (1) This work assumes a traditional output device, the CRT, in front of which the user will be interacting with the system. The user's hand will be directly visible to all three cameras, a situation that is impossible in a true IVE. (2) The most significant assumption that is not even mentioned in the paper is the fact that the monitored hand has no back ground! The user will sit in front of the CRT where the hand can be extended on top of a disk while issuing the commands. One of the most challenges in vision is the isolation of the target object (segmentation), an issue that can be easily handled in a uniform background (desk). In a CAVE, the background to the user's hand is anything but uniform regardless of the view. How about lighting? We highly doubt that their work has been tested under poor lighting conditions (CAVE settings are usually pretty dark!)

[7] Yanqing Wang and Christine MacKenzie. Object manipulation in virtual environments: Relative size matters. In *Proc. CHI'99*, May 1999.

The authors of this paper investigate the relation between human performance in an IVE and the size of the cursor, object and controller. The *cursor* here refers to the graphical object that maps the input device (controller) to the virtual world. A study was performed to arrive at two conclusions. The first (*the relative size hypothesis*) states that the **interplay** between the size of the controller, cursor, and object has a direct effect on the performance in the virtual environment rather than the size of the controller, cursor or the object **alone**. The second hypothesis that was proved shows that only the orientation time was fastest when the controller and cursor were largest. This study can help us during the development of our UI sys-

tem. The 3D pointer that was developed probably should be a little larger than its current size.