

An Augmented Reality In-Situ Menu for Selecting 3D Models

Thuong N. Hoang[†], Bruce H. Thomas[‡] and Christian Sandor^{*}

Wearable Computer Lab - University of South Australia

ABSTRACT

We present a demonstration of an in-situation menu system for loading and visualizing 3D models in a physical world context. The menu system uses 3D objects as menu items, and the whole menu is placed within the context of the augmented environment. The use of 3D objects supports the visualization and placement of 3D models into the augmented world. The menu system employs techniques for the placement of 3D models in two relative coordinate systems: head relative and world relative.

KEYWORDS: In-situ menu, augmented reality, wearable computer, Tinmith.

1 INTRODUCTION

Our demonstration¹ presents an in-situation menu system for outdoor augmented reality systems that leverages the first person perspective nature of augmented reality (AR). Instead of textual or iconic representations, our menu system uses the 3D models themselves as menu items. The 3D models in the menu itself are placed within the context of the augmented reality environment. The critical features of this menu system enable the visualization, comparison, selection, and placement of 3D objects in an outdoor real world context.

Our menu system is demonstrated running on a Tinmith[1] mobile AR system. This system is in the form of a belt mounted computing system, implementing video see through head-mounted display (HMD) helmet. The demonstration allows the user to wear the system and interact with the menu system in the context of the augmented conference venue. Our in-situ menu system helps to visualize 3D models in an AR environment. Instead of being part of the user interface, the in-situ menu situates the 3D model options within the augmented world. The menu itself allows the user to see 3D models within the context of surroundings, which makes it easier to decide which model to place into the world.

The in-situ menu is created in the form of a linear array of 3D models, whose object placement position is either world relative or head relative. The user may step through different models by pressing the *Next* or *Previous* options on the input device, which moves the array of models to either the left or the right. The models from the in-situ menu are placed into the world by pressing *Create Model* option. The user may choose to commit or delete all the placed models into the world by pressing *Ok* or *Cancel* option.

The world relative mode creates a linear array of 3D models on the ground plane, starting at an offset in front of the user, and extending to the right (see Figure 1). The models are full-size, and located at a convenient distance apart, thus allowing user to examine and compare models in detail and from various viewpoints, or to consider models in their natural placement from a distant vantage point. The in-situ menu enables 3D models to be compared with existing physical objects near the specified

location. The world relative option facilitates tasks that require a high level of visual real-world context.



Figure 1. World relative In-situ menu depicting virtual car models in front of a real-world building

The second option for the in-situ menu is the head relative technique, which attaches the array of objects to the user's head orientation, thus allowing the user to move the menu/3D object into the required position by orienting her head and/or physically moving. This mode facilitates rapid, but rough placement of 3D models.



Figure 2. Head relative In-situ menu depicting consideration of virtual objects placement in front of a virtual house

2 DEMONSTRATION

The demonstration provides an excellent opportunity for conference attendees to experience our versatile concept of an in-situ menu that serves several purposes in an AR environment: selection, comparison, visualization, and placement of 3D graphical objects, implemented in a fully wearable AR system of Tinmith.

REFERENCES

- [1] W. Piekarski & B. H. Thomas. 'ThumbsUp: Integrated Command and Pointer Interactions for Mobile Outdoor Augmented Reality Systems', Proceedings of 10th Int'l Conference on HCI, 2003

[†] hoang@cs.unisa.edu.au

[‡] thomas@cs.unisa.edu.au

^{*} Christian.Sandor@unisa.edu.au

¹ A video for this demo is available at:

<http://wcl.ml.unisa.edu.au/~sandor/ismar08/ismar08-menu.mpg>