

Chapter 15

Spatial Design and Physical Interface in Virtual Worlds

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ABSTRACT

We would like to propose a new spatial model, the “Contents Oriented Space”, conforming to the physical senses experienced in the 3D virtual worlds, as well as providing an appealing spatial experience, and present a design methodology making use of this new model. There are three necessary conditions for such “Contents Oriented Space”: (1) The contents are visible from the outside; (2) The contents are directly accessible; (3) By being directly accessible, the contents become “spatial”. By applying such a spatial model, it is possible to realize the architectural space in the 3D virtual worlds, conforming to the physical senses experienced in such environment, at the same time providing an attractive spatial experience. It is a new design methodology, able to be widely applied in the architectural space design for the 3D virtual worlds in general. The experimental use of the proposed methodology in the physical interface expanding this design methodology is also currently on going.

1 INTRODUCTION

In this chapter, the new spatial model, the “Contents Oriented Space”, conforming to the physical senses experienced in the 3D virtual worlds, as well as providing an appealing spatial experience unique to the virtual worlds, and the design methodology making use of such model will be proposed

through looking at specific examples. In recent years, 3D virtual worlds services have started to be popularized, as represented by Second Life (Linden Lab,2003). In these services, 3D form making tools have been released, and space has, in a way, become “open source”. Here, it is possible to freely create objects such as architectural buildings. Using this characteristic, many 3D virtual worlds architectural buildings modeling

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the real world space have been created. However, these models are not conforming to the physical senses experienced in the 3D virtual worlds, and have not been so attractive to the general users. Although few in number, there exist unique cases that conform to the physical senses experienced in the 3D virtual worlds, created by nameless/anonymous “residents”. Nevertheless, these are not created under a common design methodology, therefore, the degree of each completed work will depend on the ability of each user; and it lacks the possibility of reproduction. Also, it is not possible to say they provide the appealing spatial experience unique to the virtual worlds, equivalent to that experienced in architecture in the real world.

The “Contents Oriented Space” is a new architectural space model in the 3D virtual worlds designed by the authors, based on the aforementioned cases. The three necessary conditions of the “Contents Oriented Space” are as follows: 1. Contents are visible from the outside; 2. Contents are directly accessible; 3. By being directly accessible, the contents become “spatial”. By applying this spatial model, it is possible to conform to the physical senses experienced in the 3D virtual worlds, as well as realize the architectural space in such environment, providing an attractive spatial experience.

It is a new design methodology able to be widely applied in the general architectural space modeling in the 3D virtual worlds. The author has applied the “Contents Oriented Space” in the past, designing a large number of architectural/art works for the 3D virtual worlds as “*Archidemo*” (Watanave,2007). Hereafter, the existing design methods in the architectural space in the 3D virtual worlds will be examined in section 2; the “Contents Oriented Space” spatial model proposed by the authors and the design methodology making use of this model will be discussed in the section 3; the specific application of the design methodology and its results will be stated through reviewing past works dealt by the authors in section 4; the experimental use of physical interfaces currently

underway will be introduced in section 5; and the conclusion of this chapter will be stated in section 6.

2 DESIGN METHODS’ REVIEW

In this chapter, the existing architectural spatial design methods in the 3D virtual worlds will be examined by reviewing specific cases.

2.1 Imitation of Real World Architectural Buildings

There is a long history in visionary (unbuilt) architecture (Burden,1999). These works had the charm that cannot be achieved in real world. But they were works only in the thought, and not able to be experienced interactively. And also, there are plenty of previous work concerning the design of architecture of the real world that uses the virtual reality technology (Bridges,Charitos,1998) (Whyte,2002), or real world architectural buildings imitated in 3D virtual worlds(Maher,Simoff,Gu,Lau,2000) (Brouhard,2006) in recent years. In this case, the measurements and forms of a real world building are faithfully reproduced, and on the surface, it seems to be same as the building in actual existence. However, in experiencing the space through the 3D virtual world body, or the avatar, the interior of the building feels smaller than in reality. It becomes a stressful space as you hit the walls or get stuck in the spatial gaps. For the users used to navigating freely in space, not being restricted to the collision checking in the 3D virtual worlds, the walls and ceilings imitating the real world building become obstacles preventing movement, resulting in a stressful experience. Furthermore, there is a fundamental difference in the physical senses, where the real world is experienced through the entire “body”, the 3D virtual worlds is experienced through an interface such as the personal computer.

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