IASDR07
INTERNATIONAL ASSOCIATION OF SOCIETIES OF DESIGN RESEARCH THE HONG KONG POLYTECHNIC UNIVERSITY 12TH TO 15TH NOVEMBER 2007

STUDY ON RELATIONSHIP BETWEEN COGNITIVE DIMENSION OF SPACIAL MODELS USING VIRTUAL REALITY PRESENTATION

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ABSTRACT:

The expressive methods by virtual reality media have important advantages to easily visualize the visual factors and facilitate the real time analysis on questions and answers as creating database for them. Web3D, a kind of virtual reality techniques based on Web, is effectively connecting the contents with human by the intrinsic interactive function. In particular, 3D Space Model is drawing attention as the futuristic potentiality enabling the implementation of Mock-up Model that is regarded as the impossible task due to financial and time limits. But this occurs during the process to convert three dimensional space to two dimensional space in a monitor. It can cause a serious error, that is, distortion of information. Hereupon in, virtual reality, the biggest element that reckons space to visual field, and FOV(Field of View) and scale to factor then to analyze correlation with human's visual field and structure about camera in virtual reality. Through this research, Web3D's reality elevates and effect through it may be increase.

KEYWORDS: ***WEB3D, COGNITIVE DIMENSION, VIRTUAL REALITY***

1. INTRODUCTION

The modern design arena faces with digital innovation era. The computer exceeding the manual work in the expressive ability and excellent in reusability of results is settled as the effective design tool that cannot be set aside in design processes. Moreover, the digital media, the product of a computer, goes beyond the traditional functions as the expressive medium recording and delivering the thoughts of designers and so are expanded to the tool working with designers. In particular, Web3D, a kind of virtual reality techniques based on Web, is effectively connecting the contents with human by the intrinsic interactive function. In particular, 3D Space Model is drawing attention as the futuristic potentiality enabling the implementation of Mock-up Model that is regarded as the impossible task due to financial and time limits. On the contrary, the virtual reality media may degrade the reliability of response data due to the navigation environment that the web users are not familiar with because its data size is large relative to texts or images. Among the disadvantages, the most serious one is the misreading of a spacial dimension due to the visual difference between the actual space and the mock-up content in the virtual reality. In fact, the width, depth and dimension of a space that people recognize in a space can show the substantial difference from them expressed in a monitor. This occurs during the process to convert three dimensional space to two dimensional space in a monitor. It can cause a serious error, that is, distortion of information.

2. GOAL , METHOD AND RESULT

This study aims to find out the method for eyesight correction that can reduce the visual error in the mock-up space in the virtual reality and a real space and accordingly to make it effectively applied to the research method based on Web3D. For this purpose, this study primarily limits the most influential factor for recognizing a space in a virtual reality as the range of vision and Set camera FOV(Field of View, The size of camera lens shows almost inverse proportion relationship) in 3D Web and scale as a factor and operate an experiment like Figure 1.

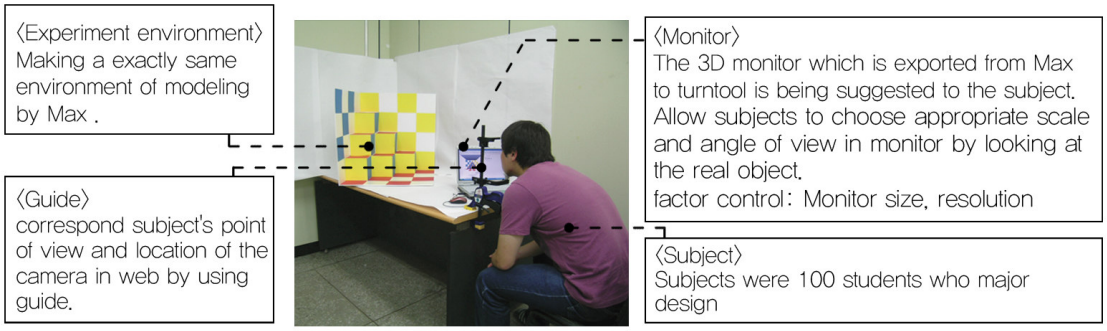
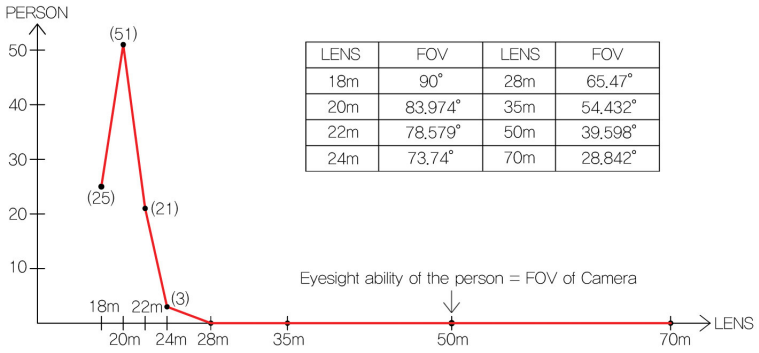


FIGURE 1: Research method of relationship between human's eyesight and FOV and scale

Like Table 1 and Table 2, the result of experience was showing 18M - 22M of distribution and subjects were showing high respond in 20M. Related to the scale, 50M which considered as the most similar to human's visual ability and 35M, 45M, 67M based on camera lens were used by changing fixed scale and as a result of observation, when average 84%, 61%, 52% and 33.5% of actual size looks same as actual size.



LENS	FOV	LENS	FOV
18m	90°	28m	65.47°
20m	83.974°	35m	54.432°
22m	78.579°	50m	39.598°
24m	73.74°	70m	28.842°

TABLE 1: Subject's reaction of identical angle of view(size of lens) Between cognition about actual space and web 3D cognition.

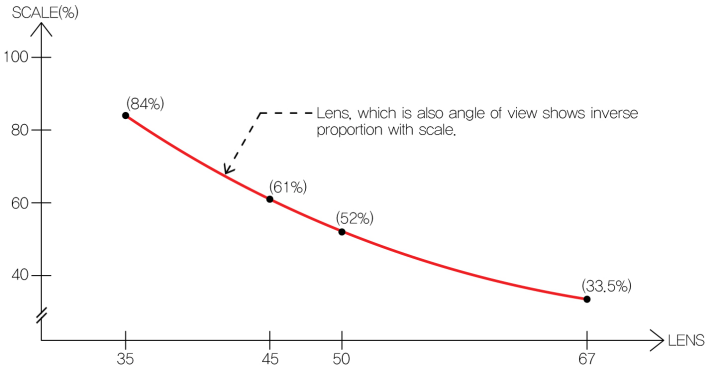


TABLE 2: Average value of subject's reaction according to the change of object scale in web 3D when the camera's angle of view is fixed.

3. CONCLUSION

This study sets several examples and makes the test models as applying the different corrective values to each example. Finally, these models are directly presented to respondents for survey and analysis. Then, through the analysis, this study will find out the relationship between the camera and Model Scale Factor in two dimensional space in a monitor and three dimensional space in reality.

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