Projection Mapping Contents Development of architectural heritage

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Abstract. As projector technology has developed, projection mapping contents development that seeks improvement of aesthetic value of buildings by projecting images onto facade of a building has been continued. For projection mapping development of large projection technology and production of video contents are made at the same time. Realization of various performance video contents continues drawing attention of people. Video contents of projection mapping are produced to form identity of a building and develop a story in performance planning stage. This helps harmonize storytelling elements of performance and three dimensional effect of video contents and plays an important role in developing various contents. This paper focuses on developing contents which allows people to feel characteristics and spirit of age of socialist realism buildings by utilizing elements which correspond to historical characteristics of headquarters of Korean Workers' Party in Cheolwon which is twenty second registered cultural properties. Contents which are covered in this paper are composed of symbolic expression technique by projection mapping technology. There are six scenes and each scene develops in three dimensions in accordance with projection mapping.

Keywords: projection mapping, video design, video contents, culture contents

1   Introduction

In recent years, cases that performance contents are produced by projecting an image onto facade of a building for business marketing and arranging space in which people enjoy culture and art have increased. Projecting an image onto facade of a building shows a role of medium which leads trend with communication and maximizes beauty of a building and exhibits characteristics of local community well. Projecting an image onto facade of a building helps viewers immerse and a bond of sympathy develop by showing a subject of performance with large screen.

 A form of design which expresses message of three dimensional image information delivery and involves concept which represents performance and harmony with surrounding environment and projection mapping has been created. In order to maximize an effect of projection mapping, original concept of a building which considers analysis of environmental elements and a subject of performance are reflected starting from planning stage.

Analysis of environmental elements plays an important role in forming overall performance image in realization of projection mapping. This serves as an evidence which environmental elements have a significant influence on production of projection mapping image.[1] This also serves as an evidence which projecting an image onto facade of a building can create vivid and dynamic space and fascinate viewers.[2]

This paper focuses on developing contents which allows people to feel characteristics and spirit of age of socialist realism buildings by utilizing elements which correspond to historical characteristics of building of Korean Workers' Party in Cheolwon which is twenty second registered cultural properties. This paper is to reproduce historical moments and create interesting and new emotions and visualize image of cultural assets based on production of 3D animation video contents by using facade of a building as screen. The purpose of this study is to establish contents production process which is suitable for a subject of performance in celebration of Korea's 70th anniversary of liberation day.

2   Related research

2.1   Understanding of media facade

Projection mapping creates changed images of a structure by projecting images onto specific objet. Projection mapping is used to expand a design of a building, visualize information and display specific image in outdoor performance by projecting images onto facade of large building along with digital lighting installation. Large building is more effective in fascinating and moving viewers as far as projection mapping is concerned.[3]

Giving a change to limited space visually began with art paintings. Development of extra large bright projector technology and edge blending technology helped realize today's projection mapping technology. Projection mapping gives a great change to facade of a building. In other words, facade of a building which projection mapping is realized can play a role as outer appearance which provides symbolic image. Projection mapping is effective in creating outdoor performance. Projecting images onto three dimensional facade creates more vivid and dynamic atmosphere and deliver a message effectively through communication with viewers.

Development of projector technology helps create new image in a building by giving a change to design of materials of outer wall with lights and performance and buildings have identity and communicate with people. Various contents have been developed to suit architecture design. There is a consistence in a subject.

2.2   Research on similar cases

Results created by convergence of architecture and media are changing along with development of high technology. Projection mapping is used in many fields all over

the world and plays a role as an image which represents a performance. The following is cases of representative projection mapping.

[Figure.1] shows Gotham building located in New York which 3D image contents and projection mapping are applied. The image was produced by support of Honda. In the image which is displayed for about 4 minutes, various three dimensional figure including abstract geometric polygons appear and disappear suddenly. Images are expressed as a form of sound visualization with shape of a building screen.[4]

Fig. 1. The Lightline of Gotham, Architectural Mapping, 2010

Ralphlauren 4D which was designed in celebration of tenth anniversary of establishment of Ralphlauren.com and launching of British e-commerce site applied 3D projection mapping that utilizes a building. 7 minute presentation is composed of 15 scenes and develops as one story and forms narrative. In the show, a model appears from a building where various changes are made through projection mapping and introduces representative goods of Ralphlauren. The show stimulates five senses by making good use of sound, wind and spray of fragrance.[5] The show maximizes promotion effect by stimulating olfactory sense as well as visual and auditory senses .[6]

Fig. 2. Ralph Lauren 4D, The World's First 4-Dimensional Experience, 2010

H&M's artwork was produced by projecting images onto a building located in downtown of Amsterdam. In H&M's artwork, shape of a building serves as source of a story. The story begins when the whole building which was covered with a ribbon comes untied. A ribbon playes a role as visual metaphor which signals finishing of scenes and new start.[7] Symbolic and graphic images such as H&M clothes and logo which come out when the building comes untied tell about brand value of H&M .[8] Dynamic image contents which are projected onto the building deliver a subject implicatively and conveys enterprise's image emotionally.

Fig. 3. 3D projection mapping in the city centre of Amsterdam for H&M

3   Video contents design concept

3.1 Background of artwork

Headquarters of Korean Workers' Party in Cheolwon, three story building was completed in 1946. The building was used as Headquarters of Korean Workers' Party before the Korea war broke out. There remains only concrete and   cannonball and bullet marks due to huge damage during the Korean war. The building was built to strengthen communist dictatorship and control of residents. The building is used to witness tragedy of division of Korean peninsula and the Korean war. The building uses hill to set base and elevation with symmetrical plane and proportion to express authority as headquarters of Korean Workers' Party. Reinforced concrete, granite, bricks, wood and wall construction were used in the building .[9]

   There are guard posts and military demarcation line near Headquarters of Korean Workers' Party in Cheolwon. Near Headquarters of Korean Workers' Party in Cheolwon is dark at night because there is no light.

3.2   Concept of artwork

About two hundred Asian artists including Korean artists participate in this performance to deliver a message of peace and harmony under the theme of historical significance of the Korean war and peace. This performance is held around headquarters of Korean Workers' Party in Cheolwon, tragedy of symbol of   division of Korean peninsula and war to sympathize with tragedy of   division. Asian five countries' young artists together with Korean artists participate in this performance. This performance is characterized by colorful scenes through creation of a stage which new technology is applied and production of images to deliver implication of headquarters of Korean Workers' Party in Cheolwon through projection mapping. The image focuses on delivering message of peace by shedding light on geographical characteristics of Cheolwon which is closest to North Korea and cultural value of headquarters of Korean Workers' Party.

4   Video contents development

4.1   Components of contents

Video content scenario that aims to deliver historical tragedy of divided country was constructed. A story develops representing a novel 'Rainfall' which is a subject of DMZ peace art festival in celebration of Korea's 70th anniversary of liberation day. Scenes appear sequentially according to the lapse of time . First scene serves as

signalling of a start of performance. In the first scene, title of performance flutters on cloth. Subsequent scenes are composed of water color painting scene that represents the initial scene of a novel 'Rainbow', a scene in which various colors of flags flutter, a scene which shows the present figure of headquarters of Korean Workers' Party in Cheolwon by moving lights, a scene in which various colors of balls pour and a scene in which large Taegeukgi (Korean flag) flutters . Light and shade are used to maximize three dimensional effect of projection mapping in each scene.

4.2   Realization of contents

Fig. 4. Fig. still image of media contents

Projection mapping work of this performance was shown on August 14, 2015 at 8 pm under theme of "Across & Along – forward together toward peace". Software which was used for realization was Cinema 4D which is 3D image production program. Resolume was used as operating program to perform curating and create edgeblending effect.

5   Conclusion

This paper has drawn a conclusion that projection mapping is closely related to characteristics of location which applicable building is located by producing and realizing video contents of projection mapping. Analyzing human-social significance of applicable building and surrounding environment is important because video contents development in projection mapping requires storytelling which corresponds to concept which buildings seek. The number and position of projectors among hardware components of projection mapping require adjustment of resolution of video contents and bring about a change in video contents. Now projection mapping technology plays a role as an element that expands an image of a building and is used flexibly starting at planning stage of performance.

As development of advanced imaging process technology brings about a change in an image of a building, so consideration of geographical characteristics is indispensible. Convergence of media and buildings in performance is expected to create various new contents and play an ideal role of presenting better direction.

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