IACC
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2016 Texas USA

IACC International Culture Contents Conference 2016 Texas USA

The International Association of Culture Contents

TUE, 19 JULY, 2016

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IACC
International
Culture Contents
Conference
2016 Texas USA

SUBJECT / *CULTURE CONVERGENCE CONTENTS*

TUE, 19 JULY, 2016 10:00 am - 05:00 pm
FRISCO DISCOVERY CENTER 8004 N. DALLAS PKWY FRISCO TEXAS USA

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IACC INTERNATIONAL
CULTURE CONTENTS
CONFERENCE 2016 TEXAS USA

IACC-ICCC 2016

July 19, 2016
Frisco Discovery Center, Frisco TX USA

Topics
CULTURE CONVERGENCE CONTENTS

Date
10:00~17:00 July 19, 2016

Location
Frisco Discovery Center 8004 N. Dallas Pkwy Frisco, TX 75034 USA

Date of Publish
July 6, 2016

Published in Korea

The International Association of Culture Contents
http://www.iaccnet.org

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Message from the Chairman of IACC

Good day.

It is my pleasure to welcome you to the [IACC INTERNATIONAL CULTURE CONFERENCE 2016 TEXAS USA] on the 19th of July, 2016.

With the conference theme of <CULTURE CONVERGENCE CONTENTS>, there will the case presentation on culture contents, discussion from the aspect of academic-industrial cooperation, presentation on UI & UX trends as well as augmented reality.
Currently, there is a growing interest on the re-creation of industries under the name of "Convergence". Therefore, this conference could provide a chance to promote the academic exchange between Korea and USA and establish the direction for future development.
IACC also looks forward to provide an opportunity to exchange information on overseas technologies and culture flow to our members through this conference, in turn creating the foundation to re-create culture contents through cooperation with local communities.
IACC sincerely hopes that [IACC INTERNATIONAL CULTURE CONFERENCE 2016 TEXAS USA] could be an opportunity to have the exchange of contents with USA and would like to thank every member of IACC, Paige Prater the Supervisor Frisco Discovery Center and Damian Kim from Gearbox Software for supporting this conference.
Thank you for your continued interest and encouragement.

Again, welcome and thank you.

Sincerely

IACC Chairman

JeanHun Chung

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Program

▪ **July 19, 2016**

Time	Content
10:30~11:00	**Registration**
11:00~11:20	**Welcome Greeting** IACC-ICCC 2016 Chairman JeanHun Chung (Prof. Dongguk University, Korea)
11:20~12:00	**keynote speech** JungAe Lee(Prof. Kyungdong University, Korea) Michael Kim (Michael Visual Impression Co., Korea)
12:00~13:00	**Lunch Break**
13:10~14:00	**Special Session** **Speaker** Damian Kim(Gearbox Software)
14:00~15:00	**Session 1** **Chair** JungAe Lee(Prof. Kyungdong University, Korea)
15:00~15:30	**Coffee Break**
15:30~16:30	**Session 2** **Chair** Duckki Ahn (Prof. Hongik University, USA)
16:30~17:30	**Session 3** **Chair** Michael Kim (Michael Visual Impression Co., Korea)

CONTENTS

Usage of Virtual clothing in Modern Console Game System

Duckki Ahn
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Abstract— It has a greater sense of definition that character in the digital content means not only the core element to the content users, but also the core marketing resource, which represent the digital contents. In order to define the character in the general story content, the character titled by both external appearance and internal distress. However, in the game content has mainly chosen the appearance since the game story integrated by user's free will. Outward of game character is the core element that game developers can express their graphical competency, developers invest vast amount of researches to the virtual clothing during the game development cycle including head shape, body proportion, hair style, and costume design. However, the implementation level of clothing simulation has been constrained by the limitation of game hardware technology; game developers are studying the efficient method to generate virtual clothing in game system. This study has researched on the transitional expression of virtual costume development of game clothing by analyzing usages in modern console game system.

Keywords-Virtual Clothing, Simulation, Console Game System, Costume Development

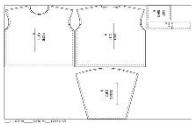
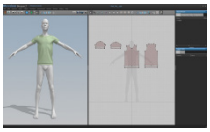
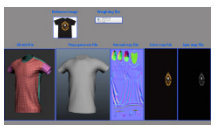
1. INTRODUCTION

Cloth simulation means modeling the behavior of cloth using various techniques of simulation. It has always been an area of great research for computer graphics community. Cloth simulation has applications in game where it used to model the garments of the character in the game, and this makes the game look much more realistic. Cloth simulation has been an important topic in computer animation since the early 1980's. Modern computer graphic technology provides advanced clothing simulation in the game industry with easy to implement for a proper result. Cloth simulation in games are becoming more popular due to its availability in game system such as PhysX and Havok where they are in contract to the common practice of using pre-computed solutions. Especially in game clothing, mesh subdivision is the core method only guarantees surface smoothness, and the number of subdivision would be one of the most critical barrier to run the clothing mesh in the real-time.

2. METHODOLOGY

Methodology of this study approached by game character's virtual clothing, and it presents importance of visual representation based on most advanced console game system. Analyzing practical workflow based on game production pipeline with technical approach of game character clothing, and this study proves three techniques of using virtual clothing creation in video game system. After applying the following process to the patterns and fabric property in the 3D simulation environment: Marvelous Designer, graphic designer can extract the model and texture in both ZBrush and Photoshop to complete the workflow of virtual clothing for game system.

TABLE 1. WORKFLOW OF GAME CLOTHING PROCESS

1.Pattern Creation	2.Simulation	3.3D Modeling	4.Game Assets	5.Completion
				

3. THECHNIQUES OF VIRTUAL CLOTHING IN CONSOLE GAME SYSTEM

There were various limitations to produce the right appearance of virtual costume in the previews game development generation because game system cannot get enough support from game engine for its limited space and speed. This matter caused the look of game clothing unnatural way compared to the real world clothing. However, using the cloth simulation program makes smoother transition of presenting realistic virtual clothing in the modern game development generation. Therefore, this study initiates the three techniques of using the virtual clothing program in the modern console game development.

3.1Reality

Game model's geometry has always limited by the numbers of polygon and size of texture map, so it was almost impossible to present realistic virtual clothing in the game engine. In addition, game shader were not accurate enough to control multiple wrinkle changes from the normal maps in real time system of the game engine. Dynamic normal map shader archived the real time swapping for the multiple normal maps, and this allows the realistic look based on character's animation with smoother wrinkle and silhouette transition.

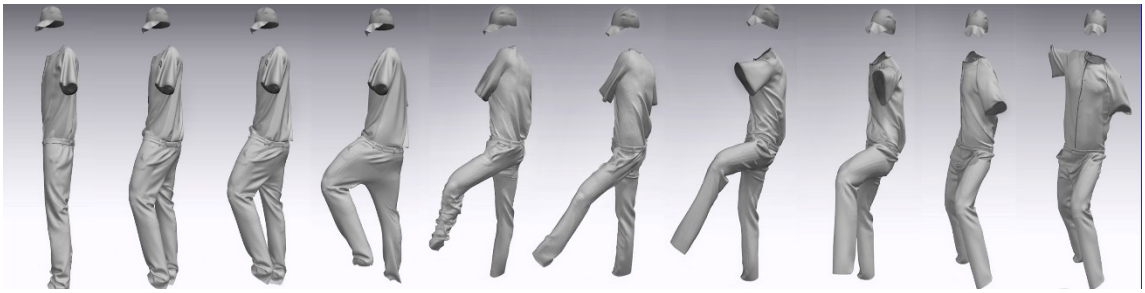
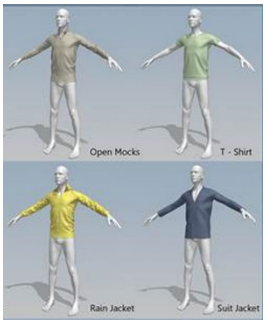
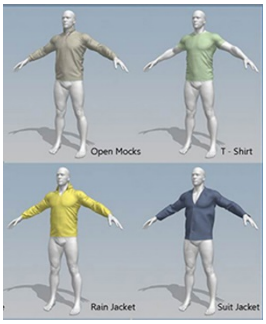
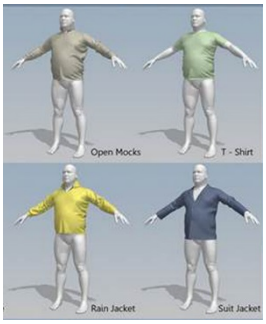
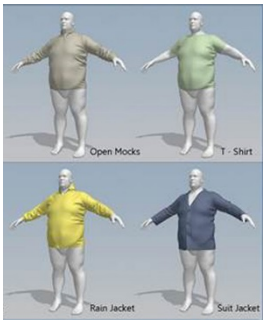


Figure 1. Reality in virtual cloth sequence

3.2Efficiency

Efficiency is another element in technique using the virtual clothing in the modern game development process. Since the virtual clothing patterns are not limited by the model shape, designer can modify the same pattern to different body types based on character costume concept. This reduces the period of game development, so graphic designer can manage extra time to polish the result. Designing high quality game costume requires by both creating proper proportion of character model and accurate setting in fabric properties to express concept design. Therefore, it is necessary to multiply the number of body types for virtual clothing

TABLE2. EFFICIENCY BETWEEN DIFFERENT BODY TYPES

Thin Body Type	Muscular Body Type	Chubby Body Type	Heavy Body Type
			

3.3Effectiveness

Library server application is designed to increase the effectiveness for both designers and programmers by sharing game clothing assets with different group of studios. Using this virtual clothing server, users will obtain numbers of high quality clothing data to multiple groups because anyone can access database from the existing server system. Considering developer's perspective, when creating and sharing assets are saved in the pipeline properly, each group of studios can implement clothing data as they wish to change. In order to maintain the sharing system, developers need to follow the rule of clothing polygon numbers per character, so developers initiate the virtual game clothing in their workflow.

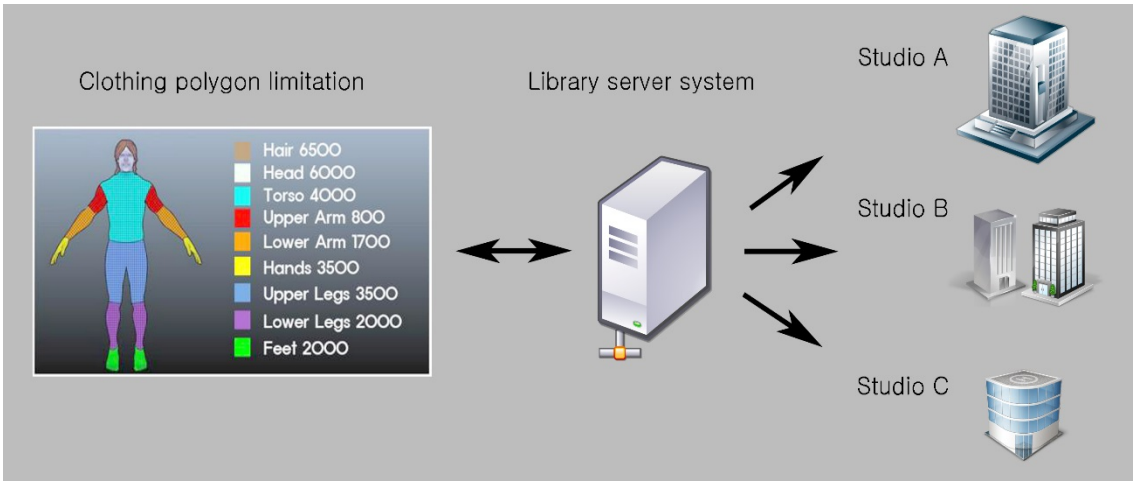


Figure 2. Effectiveness of library application in server system

4. CONCLUSIONS

The modern console game system clearly requires the most realistic and believable look of virtual clothing to define the game character. The study analysis three techniques of using the virtual clothing in productivity perspective from the console game development. It is obvious that newer and faster simulation program will provide better quality in the game engine, and will continue to evolve its functionality. By analyzing the usage of virtual clothing in game development relevantly with core techniques, the study can be applied not only the usage of virtual clothing in game industry but also capability in the fashion and industrial design.

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Study of Method for Visualization of Sound Data

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Abstract—The purpose of this study is to provide a method to visualize the sound data to the three-dimen sional image. The visualization of the sound data is performed according to the algorithm set after producti on of the text-based script that form the channel range of the sound data which allow artists to save some amount of time of technical issue and spend creating artistic stuffs.

Keywords-sound,data,3D visualization, one click solution

1. INTRODUCTION

The purpose of this study is to provide a three-dimensional visualization method of a new type of sound data that can be provided with a more dynamic and fascinating image contents, unlike in the conventional two-dimensional visualization of the sound image .

2. SOUND DATA VISUALIZATION

2.1 Concept and representation of the sound data visualization

Recently there is becoming a critical technology component with the growth of big data visualization technology market. Traditional visualization methods are mainly showing statistical information about the system logs and test results as a graph.In terms of visualization of big data shall be constrained to look at all the data. Summary data with the technical elements of the visualization , and the importance of the semantic elements that help visualize how to look at a glance is growing.

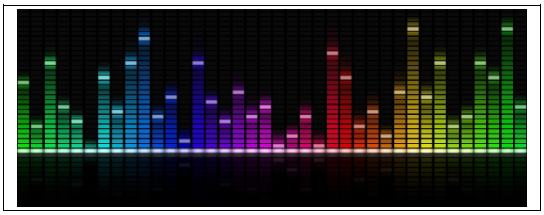

Figure 1. Fig 1_2D Equalizer in general

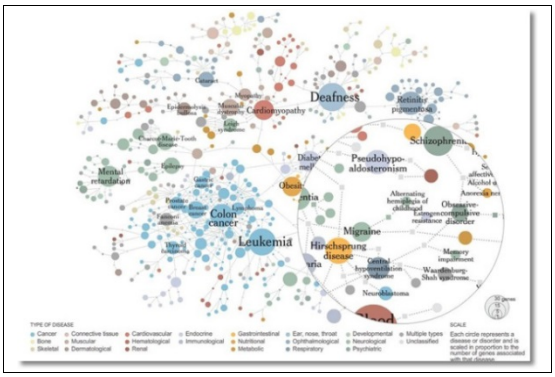

Figure 2. General sample that shows statistical graphic information using data[5]

Figure 1 shows conventional 2D sound equalizer, Figure 2, statistical graphic information as it is common to be implemented primarily in 2D images. There is a limitation of manpower in production and modification and time when it's done in new media arts in 3D space with various types of platforms. Table

1 is a table comparing the time of the target sound data (Rolling in the deep) used in this study and the average amount of works (Person Week) in case of Disney Pixar animators. One animator can complete visualization of the target sound data to work for 76 weeks.

Table 1. Disney Pixar Animator's Person Week[4]

Categories	Quantity	Person Week
Average	3s	1 week
Rolling In The Deep	228s	76 week

3. RESEARCH METHOD

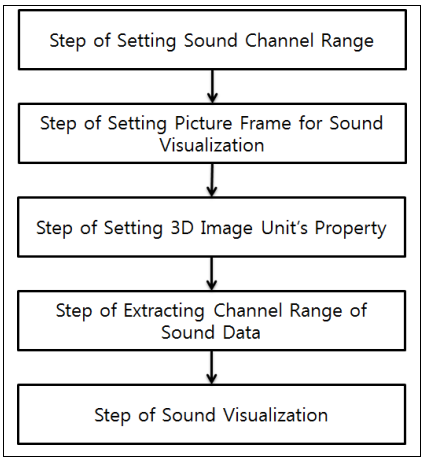

Figure 3. Flowchart of Research and development

Figure 3 shows flowchart of research and development The method consists of a total of five levels , including setting sound channel range, setting picture frame for sound visualization, setting 3D image unit's property, extracting channel range of sound data and sound visualization.

4. CONCLUSIONS

3D visualization is often the hardest part for artists to have access to the pipeline , 3D graphics tools. If artists have less time dramatically required to solve technical problems as run automated one-click solution, the same amount of time can be used for creativity and be required to express the artistic sense of the artist.The time and opportunity to create something artistic will be increased than conventional methods .

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The Impact of Image Frame Quantity on the Quality of Three-Dimensional Scanimation

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Abstract—The quantity of image frames, the widths of transparent slits and black bars on the scanline are the basic elements of scanimation, they affect the scanimation's final quality. Using the three-dimensional image frames can make the scanimation more three-dimensional and interesting. In this paper, it is shown that the different widths of transparent slits on scanline can have a great influence on three-dimensional scanimation's effects. Through some experiments, it was found that the image frame of three-dimensional scanimation will get the best visual effects.

Keywords-scanimation, image frame, three-dimensional, visual effects

1. INTRODUCTION

The content design is now everywhere, in graphs, two-dimensional designs, animation, three-dimensional movie, virtual reality (VR), and so on. In the late 1650s, Dutch mathematician Christiaan Huygens, invented 'The Magic Lantern', and opened the door to animation. Magic Lanternwas the first equipment of animation, it uses visual illusion to achieve the animation of images. Over time, thaumatrope, phenakistoscope, zoetrope, praxinoscope, stroboscope and scanimation were invented. All of them are forms of illusion animation. Three-dimensional scanimation uses visual illusion, through simple three-dimensional graphics processing, so that the original still images appear to move. It made the otherwise boring pattern have interesting visual effects. The quality of three-dimensional scanimation is very important.

2. THEORETICAL BACKGROUND

2.1 The Concept of Scanimation

The term scanimation is derived from 'scanimate', an analog computer animation (video synthesizer) system developed from the late 1960s to the early 1980s. This kind of animation technique is known under several names: picket fence animation, barrier grid animation, Moiré animation, to name a few. Scanimation is a combination of 'scan' and 'animation'. [1] It is an animation technique where one can create the illusion of motion on plain paper.

2.2 The Principles of Three-Dimensional Scanimation

Three-dimensional (3D) scanimation involves two layers, a background 3D image, usually a simple animation silhouette; and a scanline, which is a transparent sheet with evenly spaced black bars on it. To make the background 3D image, extract the simple animation's image frames and superimpose them into a synthesized image.

On a scanline, the transparent portions are the transparent slits, and the black portions are the black bars. In one scanline, all transparent slits have the same width, and the width of every black bar is equal.

The synthesized image appears blurry or jagged, but when the transparent sheet is placed on top of the image and the sheet is moved horizontally across the 3D background image, the 3D image begins to animate. This animation uses visual illusion.

3D Scanimation's basic formula is:

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The width of the transparent slit (1 unit amount) + The width of the black bar = Image frame quantity

3. METHODOLOGY AND CONTENTS

In general, the more animated image frames the animation has, the more smooth and natural looking it is. For example, to animate the transition from a circle to a square, if an animation uses only a picture of the circle and a picture of the square, it can only show the two transition states. If the animation also uses pictures showing the transition states of the two shapes, it will show how a circle gradually becomes a square in a continuous fashion.Whether it is a common animation such as walking, jumping, flying, or the transformations of different image, increasing the image frame quantity will improve the quality of animation.

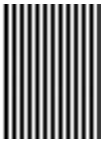
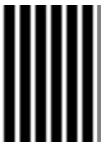
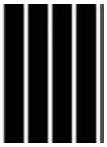
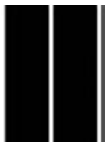
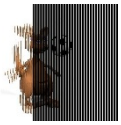
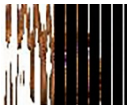
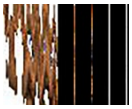
The quantity of image frames is also one of the important factors affecting the quality of scanimation. The purpose of our experiment is to find out whether or not image frame quantity affects scanimation the same way as simple animation.We used the same set of 3D animation images in our experiment.We varied the number of image frames while keeping the width of transparent slit on the scanline and the animation image size constant (the width of transparent slit on the scanline is 1 pixels; the animation image size is 259*350 pixels; the original animation used the character from others and the number of image frame is 12). We extracted 1/2/4/6/8/12 frames from this animation to form the 'new' animation, as shown in table 1. Table 2 uses the same set of images to create scanimation, by varying the number of image frames.

TABLE 1. THE COMPARISON OF DIFFERENT ANIMATION IMAGE FRAME QUANTITY ON SIMPLE ANIMATION

IMAGE FRAME QUANTITY	IMAGE FRAME
1	
2	
4	
6	
8	
12(THE ORIGINAL ANIMATION)	

We can see that, as the number of images increases, the quality of general animation improves. In this test, the number of animation image frames is 12, and the animation visual effect is natural and smooth. In scanimation, when the width of the transparent slits is constant, the width of the black bars increases linearly with the number of image frames. As the width of the black bars on the scanline increases, a larger portion of the original background image will be blocked, and eventually the original animation cannot be seen clearly. In our experiment, when the number of images is 8, too much of the background image is blocked by the black bars for the animation to be seen clearly; when then number of images is 4, the animation appears to be unnatural due to the small number of image frames in the background image. To ensure the continuity of the original animation, when the animation image frames quantity is 5 to 7, the scanimation visual effect is most ideal.

TABLE 2. THE COMPARISON OF DIFFERENT ANIMATION IMAGE FRAME QUANTITY ON SCANIMATION

IMAGE FRAME	1	2	4	6	8	12
SCANLINE IMAGE (10X MAGNIFICATION)						
BACKGROUD IMAGE						
BACKGROUD IMAGE (3X MAGNIFICATION)						
SCANNIMATION						
SCANNIMATION (5X MAGNIFICATION)						

4. CONCLUSIONS

Our experiment studied the impact of image frame quantity on scanimation's quality. In conclusion, when the scanline has the same width of transparent slit and the background images are of the same size, there is an optimal size or range for the number of image frames where clear animation with coherent and natural motion can be achieved.

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Study on UX Design of Omni Channel

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Abstract— Territories of online and offline till now were different territories that deliver mutually different values, but, invigoration of mobile environment with developed technology of IoT is forming new consumption channel abolishing each independent border. The purpose of this study lies in inducement of implication by analyzing stages of user's experience within each service and suggesting strategic direction of Omni channel.

Keywords-User experience, Brand Communication, Omni Channel

1. INTRODUCTION

The purpose of this study lies in inducement of implication by analyzing stages of user's experience within each service and suggesting strategic direction of Omni channel. Method of study included in-depth analysis of case samples based on theory of Yin(1). 3 kinds of patterns were classified into single channel, multi-channel and omni channel based on preceding study data by analyzing content of interview and relevant reports applying technique of case study, element of characteristics of user's experience in omni channel was induced with (1) acceleration of consuming experience and (2) extension of platform service experience.

2. OMNI CHANNEL SERVICE AND ITS SPECIAL FEATURE

Omni channel is a form of distribution channels of on/offline supplementing mutual disadvantages, which means a paradigm of organically integrated new distribution, and development of ICT has generated new change of distribution called "Omni Channel". Omni channel makes physical restrictions on space lifted for both supplier and consumer and expedites more positive consumption activity.

Table 1. Pattern and feature of distribution channel

Single channel	Multi channel	Omni channel
Consumption is done at single channel(offline shop)	Consumption is made through various channels being independently operated at offline.	Consumption is made at various channels of on and offline.
Offline shop only exists	Competition among on/off channels.	Complementary relation between on/off channels

2.1Change of customer behavior

Such stages of buying commodities have been changed to consumer behavior[1] with the form of AISAS added by stage of "search" between "interest" and "desire" with emerging of Internet. This indicates that model of consumer behavior has been changed from unilateral directional "acquirement of passive information" due to exposure of commodity ads to "acquirement of active information" called "search".

3. ANALYSIS OF CASE

The most important thing at the time of developing Omni channel service is to provide customers with tailored information on shopping through diversified channels for them to easily purchase and receive commodities. However, provision of unwanted information or of information at unwanted time may reduce reliability of this service. As this also may immediately affect brand image, strategy for O2O service through Omni channel will need to provide optimal tailored service through Omni channel.

3.1 Acceleration of consumption experience

Shinsegae Group, being in command of many distribution subsidiaries including E-Mart, Shinsegae Department Store, Traders, etc., constructs Omni channel through SSG dot com that combines department stores and marts into one. It concentrates on providing O2O service using Omni channel by integrating about 150 million commodities that have been dealt with at each territory of online and by providing integrated points of on and offline[2]. Such O2O service is a sample case of advantage of offline to advantage of online with price comparison, cheap price and simplicity of order added by advantage of offline, by which customers can immediately receive commodities without waiting a time for practically delivering. This may be deemed to bring profits to both consumer and enterprise, which may eventually bring increase of online consumption using offline through O2O service., and makes enterprises collect information on the area of purchase pattern of consumers and preferential area and be able to use for differentiated marketing and promotion strategy that is made for database.

3.2Expansion of platform service experience

O2O service began with independent form for marketing activities by enterprises at online or offline, but now, it is being developed as a new business platform connecting consumer and service provider. At Omni channel, communication is made through differentiated service experience from existing multi channel.
You can minimize the difference look between final output and existing animatics using game engine. And It can reduce repetitive Re-Rendering. So, it is possible to reduce the work time, production cost and waste of manpower.

3.3Timely management of customer

Omni channel contributes to improving overall management of channel including exchange and refund for customers in all channels regardless of purchasing channel in order to satisfy needs of customers who want to receive same service at anytime and anywhere..

3.4Evolved customer tailored service

At Omni channel, big data and LBS are mobile app that attract mobile purchase by recommending interested commodities based on promotion, provision of information on new products and purchase history or reality of increase and decrease helps experience technique for experiencing together hypothetical information space that computer reproduces in real space like trying to align wanted furniture within house or trying to change color or kind of furniture. This will make extend to advance to foreign market for local enterprises expedite purchase activity of wide range of commodities with globalized automation.

4. CONCLUSIONS

As a result of analysis of Omni channel with diversified service, keyword emerged called “promptness” and “customized”. This is also a characteristic generally appearing in services based on big data at connected era.. Eventually, factor for success of new form of marketing called Omni channel is also only limited to tool connecting of customer with online and offline, but shows implication of key for predominance in competition that goes ahead for creating continued customer’s experience.

This contains things of making development as an important measures for continuous formation of relationship with customers. This study can find its meaning as a basic material for exploring channel service by analyzing feature of Omni channel focused on views of customer’s experience getting out of view point of prime territories of on and offline.

Follow-up studies seems to be needed for developing practical working guideline by developing methodology for materializing continuity of continuous experience beyond the analysis by factor for special feature of Omni channel in the future.

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Tourist information guide App in the UX perspective

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Abstract— Users try to connect and experience contents in diverse temporal environment. Already brand promotion through mobile applications have been attempted in diverse forms and research about the effects have been done in various angles but it has been conducted and the perspective of analysis about advertising effects. It is expected that according to the Internet of things environment experiential elements of instant conductivity will develop further and the viewpoint that there is need for quality supplementation of function and contents that can satisfy the use context of users better than previous proactive promotion contents.

Keywords- Cultural contents, Mobile App, Stamp tour, User experience

1. INTRODUCTION

Unlike simply connecting to the Internet, mobile media provides differentiated contents from Internet through applications. More personalized and instant appearances of life response appeared that are more personalized and instant that afflicts the characteristics of smart media and contents services that reflect mutual communication as an important value are being provided. Also in promoting brands and developing local economies information and contents are provided using mobile marketing and it is taking the role of active promotion of local brands.

2. TOURIST INFORMATION GUIDE

Due to its local distinctiveness, local culture induces pride, local patriots, unity, and resident integration in local residents and by fostering willingness, awareness of participation, creativity and independence of local residents it dusty meaning of the lifeblood of local society development [1].
It is a fact that digital technology is important in the process of industrially utilizing cultural contents. This is because technology of reproducing and business culture and supplying, operating, and managing this is an indispensable part of the smart age. Cultural contents can be integrated with mobile technology to be always connected to customers and by analyzing lifestyles of customers and can provide accurate information.

3. THECHNIQUES OF VIRTUAL CLOTHING IN CONSOLE GAME SYSTEM

There were various limitations to produce the right appearance of virtual costume in the previews game development generation because game system cannot get enough support from game engine for its limited space and speed. This matter caused the look of game clothing unnatural way compared to the real world clothing. However, using the cloth simulation program makes smoother transition of presenting realistic virtual clothing in the modern game development generation. Therefore, this study initiates the three techniques of using the virtual clothing program in the modern console game development.

4. EXPERIENTIAL ELEMENTS OF CULTURAL CONTENTS APP USERS

There is a study result in the perspective of qualitative factors where usability aspect of distal contents is measured through learnability, efficiency to use, easy to remember, error recovery, and satisfaction [2], and ISO, the international standard for usability defines the factors of usability as efficiency, effectiveness, and satisfaction. Expanded concept of evaluation factors are needed that considers that cultural contents are organically changed and used based on open Internet of things network environment and technology and based on usability evaluation factors that were previously studied.

The study derived the evaluation factors of cultural contents application as 1) convenience 2) usefulness, and 3) expandability, and derived the UX characteristics of cultural content as six items 1) accessibility of information, 2) personalization, 3) media connectivity, 4) procedure simplification, 5) space utilization, and 6) Information expandability.

5. Case Analysis

5.1 Seoul Cultural Heritage Stamp Tour

It is composed of a story structure where if three out of the nine theme exploration is completed, the user can apply for Seoul cultural heritage keeper. It uses NFC, QR code, and LBS technology to induce finding contents. Although it provide service through a structure of information that simplifies the inherent feature of stamps but with the depth of information stages it provides one way educational content.

5.2 Tongyeong Stamp Tour

It is a 'Toyeong story excursion' app that is composed to recommend contents per course to deliver information and to receive stamps. It is composed of Tour go, event, tour journal, trouble wallet, and their information and it recognizes corresponding location with GPS and stamping can be automatically executed conveniently.It is composed of course search, course information, stamping, tour record, and sharing and it provides one-stop convenience to users. The composition of the contents is composed organically but it lacks quality of multimedia that is provided per page and because the design of the interface is in list form there is difficulty in carrying out desired purposes through the use of contents.

5.3 Gyeongju Stamp Tour

Gyeongju Stamp Tour produced by the city of Gyeongju is an application that moved the off-line stamp method to mobile to make it easier for users for search, execution, and storage. It is unified as an experiential service of stamping and in the detail pages that shows information about cultural properties. Its characteristic is that the experience of stamping off-line can be experienced with similar emotions and it utilizes the characteristics of mobile to automatically execute stamping and storage based on GPS.

This is also a part that was improved from a disadvantage of off-line stamping service to a convenience of mobile content.However because the information delivery method in the lower pages of the cultural properties are composed of descriptive list form, it lacks experiential elements and it shows that there needs to be improvement considering the characteristics of the media.

6. Conclusions

Cultural contents powered by digital technology called mobile application should focus on the characteristics of 'local culture' rather than technology of 'contents.' This means that when integrating with digital technology the direction of the information of the conference itself must be clearly revealed and when experiencing the service it needs to integrate elements that are differentiated from off-line contents into the core elements of the experience. The significance of this study is that it derived experiential characteristics from mobile that is different from off-line about UX characteristics of local cultural contents applications and in the future there needs to be usability evaluation as the empirical study of the characteristics.

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A Study on VFX Pipeline System Using Game Engine

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Abstract—Recently, technology has improved developed for game engine. So, it is hoped to be applied to VFX Industry in the future. Game engine is possibly more effective rendering than the 3D graphics tool used in the VFX Industry. It has high quality at the same time. The proposed effective VFX Production pipeline is based on the functional characteristics. I expect to be a research case for efficiently work, minimize the time and burden on costs by effective VFX Rendering system.

Keywords-VFX,Game,Unreal Engine4,Pre-Visualization,Pipeline, Matte Painting

1. INTRODUCTION

The latest game engine technology has evolved with the development of game production industry. Based on this, VFX Films show a high completeness using a game engine.

Current, rendering function in 3D graphics tools(Maya, 3Ds Max) requires long render time for photorealistic images and high quality work. It can be solved by building a render farm system. However, it is a big burden for the VFX Production because it requires a lot for investment. also, if you have modified the client's request in the final compositing, you have to make modifications and then must go through the process of Re-rendering. That is why the pre-visualization is important role in VFX Pipeline.

This is period is the most important part of the overall pipeline. It is a foundation that sets the necessary personnel and time for VFX Film making. Matte painting also need a lot of people and time.

2. VFX PRODUCTION PIPELINE

In general, VFX Pipeline has a total of three steps in the Pre-Production, Production, Post-Production. Pre-Production is the step of create the production schedule and check the possibility by various tests. Production is the main step of the pipeline which involves the actual modeling. Finally, Post-Production is the final step which involves Lighting, Compositing, FX. There are different pipelines for each part and project. But, the pipeline form is similar and always affiliated.

2.1 Pre-Visualization

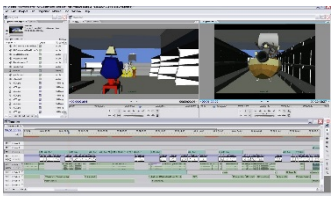

Figure 1. Production Environment for Matte Painting

In the Pre-Visualization step, with at least modeling data and values of the camera, one can try to work up the films completed before[1]. Pre-Visualization is the test step for the smooth Post-Production work.

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2.2 Matte Painting

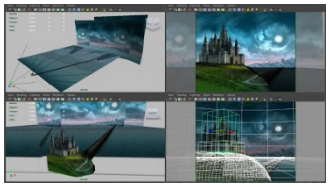

Figure 2. Work Environment for Matte Painting.

Matte Painting means expressing elaborate graphics that's not expressed in the actual filming, such as realistic photo[2]. The VFX works express realistically no difference between the actual image using Matte Painting consider the sense of distance and size. Matte Painting artist is much needed in the process. And the more complex works requires a lot of time and artists.

3. VFX Pipeline System Using Game Engine

3.1 Pre-Visualization

Existing Pre-Visualization is simply checking the movement of the character and the camera in the image. After the final output, many problems such as different look from the first and video connections not running smoothly can occur. When these problem occur Re-Rendering with repeated modification must be done. However, the game engine doesn't need Re-Rendering because It support real-time rendering. To use the game engine, first create a modeling source in 3D Graphic Tool. Second, Import the camera setting value from the 3D Graphic Tool for use in game engine. Third, you can check the expression of the light, through modeling placement and light installation. The same working process with 3D Graphic Tool, but when the work is done in the game engine, you can check possibility of effect and expression of image in real-time.

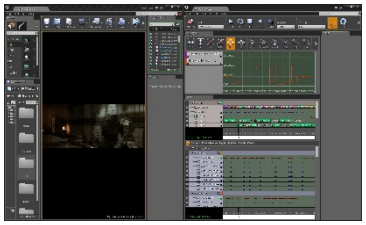

Figure 3. Matinee of Unreal Engine.

You can minimize the difference look between final output and existing animatics using game engine. And It can reduce repetitive Re-Rendering. So, it is possible to reduce the work time, production cost and waste of manpower.

3.2 Matte Painting

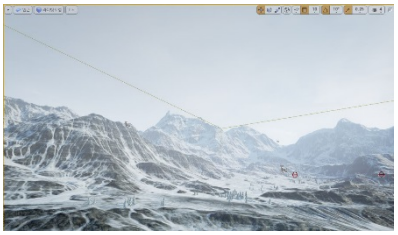

Figure 4. Production Environment for Unreal Engine Map.

The existing work method is showing the process of object placing and painting projection camera in the virtual space in 3D Graphic Tool, after a simple modeling. In this process it requires a lot of manpower, a lot of time and has the disadvantage of working again when you have to modify the client's requirements in compositing process. On the other hand, if you create matte painting using the game engine, you can import the camera setting value and also to create a map of the game. But modeling and image production method is the same. It can be a complex process. But, It can simplify the work utilizing the high quality expressiveness and real-time rendering of the game engine.

4. CONCLUSIONS

Through this technical case, Proposed VFX Pipeline can reduce the cost burden through the game engine due to expanding the low-License policy. It can be used in small-scale Production. In order to use production method using the game engine it require experience, Tool control capabilities. It also requires training the relevant professionals. Because it is presence means big difference in the operation efficiency.

However, this production method utilizing the game engine has the advantage of real-time rendering. compared to widely used in VFX production now. It is also expected to reduce the cost of production.

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The Aesthetic Value of Metamorphic characters in Superhero Movie

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Abstract—Metamorphosis of character in the superhero movie creates a visual style that can be applied to one of the features of the superhero genre. It shows the appearance and the inner mold surface, creating a change and aesthetic characteristics of the visual shape. In doing so, three aspects deserve special attention. First metamorphosis is done through the body to the recognition and expansion of perception, the second of the technology, evoke the virtual achievements addition imagination of pataphors. It creates a transcendental sublime evoke a special reverence of the ecstasy of emotions on the last to visually reproduce the process of transformation.

Keywords-metamorphosis, superhero movie, metamorphosis, transformation, virtuality, reality effect, pataphysics, technological sublime

1. INTRODUCTION

The genre is the superhero movie which is focused on the actions of one or more superheroes: individuals who usually possess superhuman abilities. Most superhero movies are based on comic books. It was destined for a path full of obstacles and transformations, as even a brief examination of its development will demonstrate.[1] At this time, the metamorphosis of a superhero, not only the narrative aspect, shows the characteristics of the superhero that can be immersed in the works in the movie that especially need the visibility. The meaning of metamorphosis contains that there is no change in anything else.[2] Transformation surface of the super hero is displayed in a visually prominent look and inner feature. And, through the body the character metamorphosis is carried out, the era of the super hero, cultural, personal, is a recognition theory of the population, to show the ontological value has been put aesthetics. It is reflected in the appearance. Therefore, the reproducibility of the transformation, it is necessary to try to rethink from the aesthetic point of view. This paper explores the aesthetic value of the transformed character that determines the visibility in the superhero movie.

2 . AESTHETIC PERSPECTIVE OF METAMORPHOSIS CHARACTERS

2.1 The Body as an Extension of Recognition and Perception

Superhero character will turn into different types of physical body through the process of creation and destruction that continued to occur in the body created by a new sense of transcendent power and will. It is 'the reality' in the core of the recognition of the metamorphosis subject. This creates a perceptual reasons for the body on how to reproduce the reality and the perception of the existence of metamorphosis. The transformed body in a superhero movie appears to reflect the medium of the age to sense the body. There are diverse forms of metamorphosis examples of 'Batman' series through the hands of numerous artists in the comics , TV and films. We can see the various character's transformed costumes from 'Batman(1989)' of the '80s styling masks and body suits to 'Batman vs Superman: Dawn of Justice(2016)' of the appearance which is equipped digital device. And we think of this is a message that McLuhan said, as "extended body", show how to recognize the media that with the era is reflected.[3]

2.2 Pataphysics :The Virtuality of Metamorphosis

We consider the reproduction process of the virtual image is not a simple mechanical duplication of the image. It appears as a metaphor for "modified replication" based on the similarity with objects to be transformed. Metamorphosis can make blurring the boundaries between reality and virtual technology. And the audience is willing to enjoy this dazzling scenes. Alfred Jarry expresses this 'pataphysics'.[4] For example, a superhero 'Wolverine' (X-men, Days of future past, 2014) is reproduced by a mixture of real and virtual character transformation. We could see the superhero's metamorphosis which is superposed

with the metaphor that distinguishes between virtual situations and reality in the past. But nowadays it is changing by the 'pataphor imagination'. 'The pataphor' is expressed through a transformation across the past, the current and future. This means that, with imagination, and the scientific skills due to technical transformation virtuality appeared to make the passage of the representation of reality and the virtual recreation to give the superhero as a free transcendent presence.

2.3 The technological Sublime

'Metamorphosis' is reproduced in the body of the otherness. A new type of metamorphosis is more a superman enhance their reborn with early temporal and supernatural change as the alter ego of the self. When we see this process of the transformation of characters, we can stay in and watch the expression of intense emotion. For example, we can consider the power of transformation that the time differential reproduction 'Bullet time' appeared in the character of Quiksilver (X-men, Days of future past, 2014). This allows a time travel experience of detaching the time and space of a camera (or viewer) from that of its visible medium. And the audience will be immersed in the experience of the sublime scene is unrealistic and purely visual amusement and admiration. We can call this feeling as a 'the technological sublime'. New technologies are at the origin of a new aesthetic aspects, 'the technological sublime', which is defined by new categories: the de-subjectivation of aesthetic production, the hyper-subject, and the suppression of the symbolic and the meaning.[5] And we can feel deeply the sublime through the CGI in the movie which is the transcendent power of the transformation of superhero that cannot be replicated in actual technology.

3. CONCLUSIONS

This study suggest the superhero genre's aesthetic formations of viewing capacities. We can see Superhero in the movie reflects the medium of perception and sensory experience as transcendent existence through the transformation of the body, and expand its presence. In addition, the transcendence of transforming superheroes deepens the pataphysics of imagination reproduced by the power of virtual technological potential to create new virtual relationship to reality and the image of the target. Finally superhero appears as a metaphor from outside the bounds of the body is transformed into the sublime transcendence is felt through a process of metamorphosis. This makes the aesthetic experience a feeling impossible to reproduce that experience out of this existing transcendental transformation of sensory with the hero. This paper will be presented to the aesthetic value associated to the formative of transforming the character. Through the limited space in mind that there is somewhat lacking part add to fully discuss, and that puts boiler process as a preliminary study on the formative characteristics of the future transformation of the superhero.

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The Study on the Educational Contents Using Virtual Reality (VR)

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Abstract— In accordance with the sharply growing VR industry, each sector studies application methods of VR, and experts expect VR as a new platform even in the education sector. Before the introduction of VR, this study investigated factors of success and failure of smart learning through the cases of educational solutions using smart devices. In addition, through the Google Expedition program that successfully used VR contents for education, this study suggested developmental possibility and future direction of them.

Keywords-Virtual Reality, VR education;educational contents, smart learning, Google, Expedition, cardboard

1. INTRODUCTION

In accordance with the smart education promotion policy carried forward by the Ministry of Education for years, the attention of smart education was high; however, it has not lived up to our expectations because we followed the same educational paradigm of PC platform and because of the poor contents and surroundings. This study aims to suggest cautions and direction in using VR contents for the education sector, expecting positive effects in the future smart educational field by using virtual reality (VR) technology, which is rapidly growing nowadays.

2. RESEARCH CONTENT

2.1 Cases of smart learning

The Ministry of Education, Science and Technology (2011) presented smart learning environment as a new learning environment, claiming that the educational environment of schools had to be changed into the system that each student could study properly according to their aptitude and level, anytime, anywhere, through the overall change in the educational system. [1] However, due to the inefficiency compared to the high cost and the lack of good digital contents for smart education, the ministry began to review the policy in general in 4 years and changed the plan. Besides, there were controversies over difficulty in managing expensive devices and controlling students in teaching. Foreign countries also introduced smart devices and contents for smart education; Google and Apple are the representative cases. Google responded to the education market through ‘Chromebook’ and ‘Google for Education’, and Apple through ‘iTunes U’, ‘iBooks Author’ and ‘iBooks 2’. However, the management agency of the Los Angeles public school, which introduced iPad and electronic textbook of Apple using $1.3 billion in 2013, demanded a refund from Apple. [2] It was also a problem caused by effectiveness and cost. On the contrary, Chromebook that had a 1% educational market share of America in 2012 showed explosive growthup to 39% in 2014. Success factors were cheap devices and contents easy to manage class.

2.2 Cases of using VR in the education sector and its characteristics

In the 2015 Web Summit Conference, Palmer Luckey founder of Oculus VR expressed his expectation of the utilization of VR, saying “Just reading books is not the best education. The experience learning

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through VR will change the educational environment." Google also has been operating the Expeditions Pioneer program since September 2015, and revealed that 100 thousand children experienced the education using VR, just in 2 months after starting the program. This program lowered the burden of cost by applying the cardboard, Google VR device. Due to the cardboard properties, the spread of smartphones has to be made, but the cheap and simple cardboard became a great advantage for Google to rapidly occupy the VR education market.

Figure 1 Cardboard &With Google Expedition[3]

The Expeditions Pioneer program is the experience-type contents that many can see VR images at the same time. Besides, for a guide the point students see is marked, so it provides convenience to communicate during class. Students can safely experience through VR the field out of the classroom at low cost, and teachers can naturally arouse students' interest and proceed with class. This proves VR is the proper example of a new educational platform. It will also be one of the solutions that fit the intent of smart education promotion policy of the Education Ministry.

3. CONCLUSIONS

As the year 2016 can be called the first year of VR popularization, so VR shows rapid growth and is used in various sectors. Global IT companies had already competitively entered the VR market, which is expected to keep sharply growing in the future. Each major research institute predicts the outlook for the VR market differently, but it is a common view that it will grow very fast for the next 5 years. Especially, the utilization of VR in the educational sector is to be strategically pioneered. This study found through the existing cases of smart learning that efficiency and reasonable price are important when a new platform is introduced into the educational environment. Moreover, Google Expedition program showed the possibility of development in the VR utilization for education. Although VR application methods are being developed every day, there are not so many contents that can be used continuously. On the way to the spread of VR, It must be necessary for experts in each sector to study together and develop high-quality contents. If VR is successful with the spread in the educational sector, the future educational environment will be greatly changed.

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Investigation of Repeated Representation of the Visual Media

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Abstract— Repetition is one of the most common elements in Visual Arts. A motif can be used for variations of repetitions to be expressed in an individual object as well as the whole composition. This paper provides examples of repetition in existing visual arts and examines its effectiveness.

Keywords-repetition, media, motif, pattern, time

1. INTRODUCTION

Repeated representation, as an expression, refers to the use of repetitive motifs in the same work. In this paper, we will consider the conception of repetition of simplest forms of motives, circular or rectangular motif, being expressed and recognized, as the main focus of investigation into repeated representation of the visual media.
Simple form of repeated representation does not pose a great significance as individual entity, but expresses the overall pattern. However in repeated representation of the same motif expresses both the overall and individual at the same time. When overall and individual expression exists at the same time, it effects the design work in various possible ways, but the main purpose of this study is to investigate such effects objectively.
In the broad field of art that includes visual design, one well known work that utilizes repeated representation is that of Andy Warhol. In particular, Campbell Soup series, the series of Marilyn Monroe , Mao , etc. Use of repetition in the communication design also serves to emphasize the imagery. Considering that Warhol was originally a designer, repetition may also be useful in the field of visual design. In this study, we investigate specific examples of repetition used in visual design area, seeking for better understanding and improved usage of repeated representation in design.

2. REPETITION

2.1 Andy Warhol's silkscreened repetitions

Because Andy Warhol's work frequently uses repetitions, we should start the discussion from his work if we were to investigate the expression of repetition.

In many of his works, Andy succeeds in symbolic imagery via repetition. For example, his Marilyn Monroe series, which started just after her death, uses the sex-symbol image of her portrait repeatedly to highlight originality. In addition, exhibited in his first solo exhibition in 1962, Campbell Soup series and other works interpret the sense of dizziness that arise from routine and mechanical repetition in mass consumption society by using repeated representations in his drawings.

In modern art, the value of Andy Warhol's use of repetition as a form of expression may have more than a few meanings. Undoubtedly, Warhol's contribution to Modern Art is more than just repetitions but this paper focuses on the repetition of motifs. His silkscreen process is a printmaking technique to produce multiple versions of same image but he deliberately made choices to change the ink variation to make the appearance of accidents, but intentional show of errors can also be seen in the usage of representation by repeated motif and transmutation or slight variation of ink density. Study on such work may be due to his sensitivity as designer, since he originally started his art study as an advertisement illustrator.

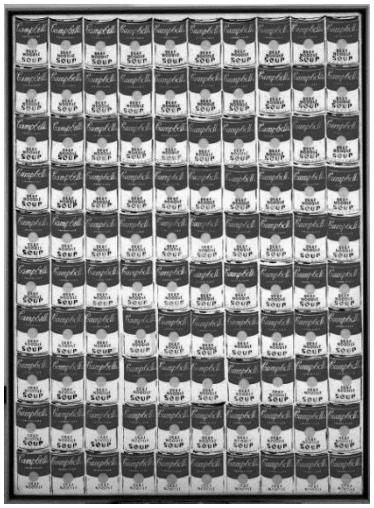

Figure 1. Warhol- 100 Soup Cans-1962.

3. REPETITION IN VISUAL ARTS

3.1 Difference in artistic repetitions by media.

In attempts to provide simpler presentation, Visual Art can be broadly divided into two parts: Graphic Art and Time-Based Media Art.

1) Graphic Art

Visual artistic expression that is repetition of a plain motif and it appears an individual object has no meaning on its own, butdesigning and arranging of patterns to be repeated in precise manner will exhibit both elements: motif and pattern.

Some of M.C Escher's work is a classic example of graphic art. His work was influenced by mathematics on the surface but he applied motifs through geometric patterns and produced abstract tiling.

2) Time-Based Media Art

One of the characteristics of Time-Based Media is ability to add duration as a dimension when the artwork is being displayed repeatedly. It also can display the same object in multiple time durations.

4. CONCLUSIONS

This repetition needs to be considered separated between the thing that we see in our daily lives such as still images, posters and the multi media which changes with time.

On this research, to create a distinctive symbol system in the visual design of the effects of repeated motifs that through the prepare specifications. We will have a lot of characters, personality and the meaning of media.

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Research On How to Design Face Composite Through Computer-Generated Technologies Based on VFX

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Abstract—this research thesis conducted an analysis on effects and limits of 'Skin Rendering', one of fields difficult to reproduce or recreate. In order to study 'Face Composite Techniques', this thesis analyzed the ongoing situations of computer graphic technologies. And, this thesis made intensive researches on 'mapping' and 'rendering' process, one of the most important parts, for the purpose of reducing the heterogeneity of 3D objects and real image. In addition, this research thesis is to study 'Rendering Techniques' fit for each situation, and make a comparative analysis on quantity values and consider the possibility of 'face composite' of VFX

Keywords- VFX, Face Rendering, Normal Map, Computer Graphics

1. INTRODUCTION

During the late 1970s and early the 1980s, computer image rendered gradually 'reproductive' and 'real'. In the same period, 'reproductive' picture and photo came to appear. In art world, we can see 'realism', neo-expressionism', and post-industrialism 'simulation' photo. VFX(Visual Effects) has been accompanied by the development of computer graphic. "VFX" encompasses all kinds of digital techniques based on computer graphic among image design techniques applied into film or animation industry. In recent years, the advance of computer graphic puts an increasingly LESS of restrictions on the expression of VFX. Among other things, researches to reproduce human beings are being made in various terms.

Accordingly, this research thesis made a comparative analysis on the work of contemporary 'reality-focused image works, which reproduced 'real' skin. And, this thesis designed with the tool of 3D graphic technologies and photographed computer-generated models in multi angles, to extract 'REAL' skin materials or ingredients through computer-generated technologies. Based on this, this thesis attempted to seek the effective design methods and potentialities to reproduce REAL face with the aid of VFX. To do it, this research thesis used and studied 'Maya', one of the most typical 3D software methods, which is most commonly used in VFX.

2. PHOTO-BASED SKIN TEXTURE EXTRACTION

Based on photo modeling 3D and extracting textures and then finally Rendering it can give the most REAL effects. When it comes to 'photo-based modeling method' , it plays a role to extract each X ,Y ,X axis out of computer and link and model each axis, through images photographed by objects of original texts in every angle. After modeling, image is being RENDERED and extracted again in multi angles. And, this is mapped in the process of designing objects of 3D. This is one of methods most commonly used in VFX. In order to reflect these features, photos of human beings' faces are to be taken in multi angles. Also, X, Y, Z axis must be exactly indicated so that such axis can be demonstrated in photo. In this regard, this research thesis fixed rectangle-shaped box on the head of a model and photographed it.Built on photo, 3D is modeled and photo maps are extracted with the tools of program of 'Image base' modeling. And, "3D-Modeled" face is designed with the tools of photo maps most fit for each angle, given that it must be photographed in different angles and ways.

3. RESULT OF IMAGE

After facial Modeling and Photomap and normal map must beextracted, character animation must be designed and then RENDERING process ought to be made. RENDERING already-photographed backgrounds with the aid of Image Based Lighting through HDRI(High Dynamic Range Imaging) technique can save time required in the process of 'Lighting'. As yet, there are not graphic tools allowing 'color compensating' or 'color light adjusting'. Thus, Key Animation is required to adjust levels according to each frame. Character Animation can reproduce more real models when it adopts 'motion capture animation' method, rather than 'key frame animation'.

Figure 1. The image photographed in multi angles&.Color Map

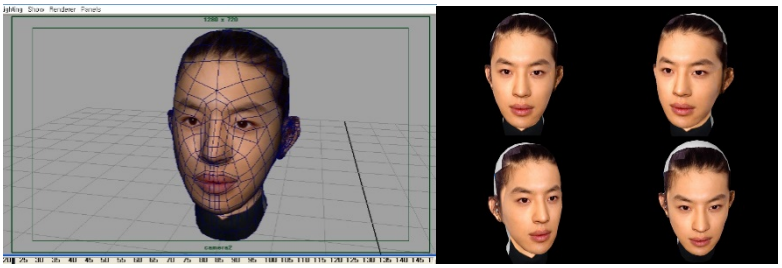

Figure 2. 3D Viewport applied into map images &The final result of 3D face rendering

4. CONCLUSIONS

In order to achieve effective 'Skin rendering' process, applying HDR image into Imaged Based Lighting can create REAL results, in the first place, Second, to extract photo-based skin texture requires photographing shortly after indicating 'X, Y, Z' axis in advance, namely, fixing rectangle-shaped box on the head of a model. Third, bump-map makes it a principle to use just one of either black or white channel. Normal Map is demonstrated through Red, Green and Blue channels when applied into Bitmap image. Actually, this sets x, y, z axis of vertical horizontallength and depth. Currently, the limit of expression has been noticeable reduced, thanks to computer graphic technologies. However, there are much difficulty in reproducing or recreating REAL-like human beings. Whereas expressing immoveable human beings does not face much difficulty, expressing 'skin tissue' in the process of moving characters too much causes even more difficulties.

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Research on Audio-Visual Components for Improved Immersion of VR Contents

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Abstract— This study identified audio-visual components that can maintain and improve immersion, which is one of the most important characteristics of VR contents; analyzed their usage based on VR video contents; and proposed an appropriate direction for audio-visual induction. The result suggested, for the visual aspect, imaging and editing techniques and graphic images that reinforce characteristics of VR video contents are required, whereas, for the audio, 3D sound based on head tracking, narration, character voice, and sound effects are needed. In addition, future VR video contents will need to include technical and content-related elements that can improve immersion, and further research needs to be conducted.

Keywords-VR contents; VR video contents; immersion; audio-visual induction; technical and contented-related components

1. INTRODUCTION

The most outstanding advantage of VR is that it provides stronger realism and immersion than conventional video contents. Mark Zuckerberg, CEO of Facebook, commented the next trend of video contents would be immersive contents, when announcing the financial performance of Facebook in July 2015. Currently, many large corporations like Google, Facebook, Apple, Sony, and Microsoft have joined the VR industry, and the market has drawn attention as it is allegedly the first market in which both the first and second generation of Silicon Valley companies are competing together [1]. The most important issue in the VR market at the moment is VR contents.

2. PURPOSE

The purpose of this study is to propose an effective method of audio-visual induction that can maximize immersion of VR contents, based on the VR action drama 'Shine or Be Mad,' produced and published by the Korean national TV broadcaster MBC on its app and YouTube channel on September 5, 2015, and the VR movie 'HELP' produced and published by Google on April 18, 2016, by analyzing the components of audio-visual induction.

3. METHOD AND CONTENTS

As a method of this study, relevant theories were reviewed based on literature and previous research, and elements that were used for audio-visual induction in Shine or Be Mad and Help were divided into visual elements and audio elements for analysis. Also, the audio-visual elements were subdivided into technical and content-related elements for analysis and schematization. The result showed that, first, common visual elements in the

two VR contents included shooting, editing, lighting, stitching, graphic images and effects, and common audio elements included narration and dubbing by voice actors and sound effects. And then, technical elements were divided into shooting techniques, editing techniques, lighting, graphic images and effects, and surround sound, and content-related elements included theatrical direction focused on mise-en-scene, lines and narration of characters, and movements of characters and objects.

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TABLE 1. COMPONENTS AND CHARACTERISTICS OF AUDIO-VISUAL INDUCTION

Shine or Be Mad VR	***Classification***	**HELP**
· Fixed, jimmy jib, drone, wire, electronic tilt up shooting · Implication of the plot based on parts of previous TV drama, jump cut · Natural light and strong lighting · Partly rough stitching · 2D graphic and special effects	**Visual elements**	· Drone, wire, long take, one take, shooting · Editing replaced by blocking of characters · Low lighting · Smooth stitching · 3D characters and CGI
· Narration and dubbing by voice actor · Sound effect	**Audio elements**	· Voice of characters · Surround sound effect

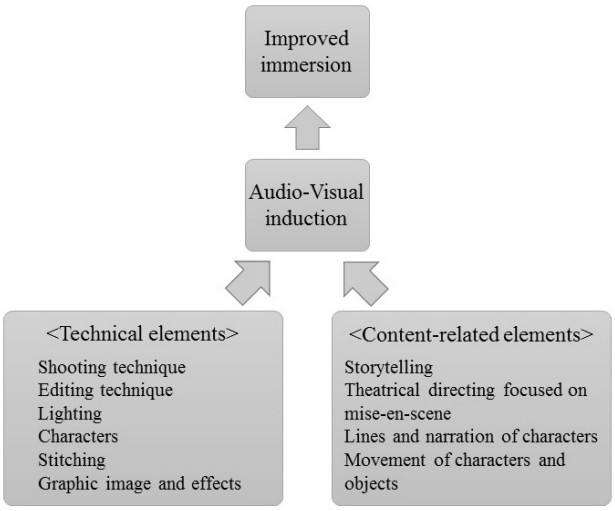

Figure 1. Technical and content-related elements of audio-visual induction.

4. CONCLUSIONS

The findings in this study suggest that, in order to improve immersion of VR contents, first, audio-visual induction through audio and visual elements is needed, and specialized technical elements and content-related elements for VR contents are required. The limitation of this study was that it was based on insufficient sample. Future VR video contents will need to use devices and technologies for audio-visual induction that can maximize immersion, which is one of the most outstanding characteristics of VR video contents, and further research will need to be conducted in the future.

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Preparation of Papers in Conference Format

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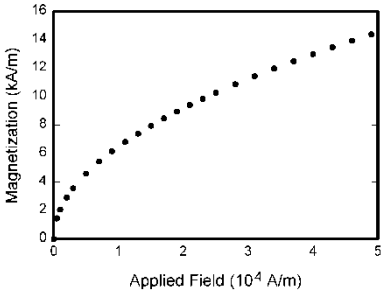

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4. CONCLUSIONS

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PUBLICATION INFORMATION

Title
IACC INTERNATIONAL CULTURE CONTENTS CONFERENCE 2016 TEXAS USA.
IACC-ICCC 2016
Proceedings of ICCC 2016
Location
Frisco Discovery Center 8004 N. Dallas Pkwy Frisco, TX 75034 USA

Date of Publish
July 6, 2016
Published in Korea

Address
The International Association of Culture Contents (IACC)
IACC, 227 ManHaekwan, 30, Pildong-ro 1-gil, Jung-gu, Seoul, 04620, Republic of Korea
http://www.iaccnet.org
E-mail : famousis@naver.com
Tel : 82-10-2260-3767
Publisher.
IACC Chairman / JeanHun Chung

Organization

Editorial Design.
JungAe Lee
Michael Kim KiBeom