A Study on the Characteristics of Digital Architecture Expressed in the Contemporary Fashion Works of Hussein Chalayan

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Abstract

This study analyses the qualities of digital architecture applying digital technologies by examining the qualities applied to the fashion designs of Husssein Chalayan. The aim of this study is to forecast in what ways the digital influence over fashion will evolve. This study was based on literature and case studies to examine the characteristics of digital architecture, and a case analysis of fashion design was conducted on the collections of Hussein Chalayan that draw heavily from technology. As a result, it was possible to classify the characteristics of digital architecture into five groups - immateriality, interactivity, nonlinearity, liquidity, and hypersurface; in addition, all of these characteristics were found in the works of Hussein Chalayan. The digital paradigm will continue to influence modern architecture and fashion in functional and/ or expressive terms that will continue to strengthen through the further advancement of digital technology.

Key words: Digital, Digital architecture, Contemporary fashion, Hussein Chalayan

I. Introduction

Digital technology of the current age has grown so boundlessly that it is triggering a radical change throughout culture, art, science and lifestyle. It has rapidly penetrated into our everyday lives. Of the three fundamental human needs - clothing, housing and food - the first two appear to have various phases of digital evolution.

Meanwhile, urban spaces, including architecture, are carefully seeking their role as electronic interfaces. The new environment, created by digital technology, has freed humanity from the borders of physical limits of time and space. It is now transforming this era's paradigm of value: from being static to diversion, materialism to immaterialism, heaviness to lightness, logical relationship to indefiniteness and clarity to obscurity. Architecture is restructured according to the contents within an electronic world,

and the image of structured space expresses these contents (Kwon, 1999). Also, the fashion industry is taking new turns according to the rapid development of digital technology. Not only various digital technologies are used in production, but also digital elements are inflected in various ways to express new ideas of designers.

The relationship between fashion and architecture has been researched continuously, and the similarities that they show of this same age are not just simple coincidence, but the expression of the same intrinsic characteristics. The shapes of fashion, in their extensive range of historical styles and streamlined modernism, are seldom independent of the architecture around them. Fashion has not always been so distinct from architecture. In the long journey of human existence, clothing first provided the body with wearable shelter, with architecture manifesting as a framework to support the animal hides and panels of fabric that became roofs and walls (Quinn, 2003). Also, renowned designers Pierre Cardin, Robert Capucci and Gianfranco Ferre are also trained architectures,

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and they make clothing according to architectural principles rather than following the rules of tailoring (Quinn, 2003). Among them, Hussein Chalayan is the one who has much interest in architecture and works as a challenging designer. He says he has more in common with architects than fashion designers, and collaborates with architectural practices to realize his fashion innovations. His clothes are minimal in look but maximal in thought; his fascination with architecture, spatial dynamics, urban identity and aerodynamics are expressed in garments based on concepts, architectural systems and theories of the body. He moves forward with completely new forms, shapes and materials conceived to define space, reflecting the construction principles and notions of contemporary architecture more than conventional fashion. His works are more often described as dynamic structures than clothing (Quinn, 2003).

The preceding studies that showed the relationship between architecture and fashion are; Kim and Hur (2005) studied on the formative characteristics in architecture and fashion of the modernism period; Yang and Yang (2006) and Park and Lee (2008) studied on architectural paradigms expressed in the twentieth century fashion. Also, Hussein Chalayan's works were analysed based on diverse perspectives in the preceding studies; Kim (2000) studied on deconstructed space and visibility in Hussein Chalayan's design; Jang (2002) studied on experimental design depicted on Hussein Chalayan's works; Yun (2009a) analysed the interdisciplinary and metaphysical characteristics of Hussein Chalayan; Yun (2009b) analysed historicism, national identity, multiculturalism and cultural structuralism of Hussein Chalayan.

The preceding researches mainly focused on the similarities between fashion and architecture in terms of form and structure, but this study attempts to extend the scope of them by discussing the similarities between contemporary fashion and digital architecture in terms of digital characteristics. In this digital era, it is fully probable that Hussein Chalayan, one of the most influential fashion designers of our age, and who draws heavily upon technology to revolutionize the form and function of clothing, could be influenced by digital. Therefore, it is presupposed that the digital characteristics could be discovered in his works.

Thus the purposes of this study are; First, to analyse the characteristics of digital and digital architecture; Second, to examine these qualities found in the fashion designs of Hussein Chalayan; Third, to forecast in what ways the digital influence over contemporary fashion will evolve.

This study is based on literature and case studies. The general theoretical inquiry and the case analysis of fashion designs were conducted on related papers, books, and internet materials. The case analysis of fashion designs was focused on the collections of Hussein Chalayan; his 936 works from the 1994 F/W season to the 2010 F/W season were analysed - from the time he started his career up to now.

II. Concept and Characteristics of Digital Architecture

1. Concept of Digital Architecture

As we live in an era in which we cannot design without digital information and digital media, the new media and the digital media based on technological innovation are turning into ideal architectural media to realize the thoughts and imagination of architects (Kang & Lee, 2004). Computer aided design poses a different concept in terms of space perception as opposed to traditional design. As designers utilize digital media as a new design tool, many aspects of architectural design procedure are changing. As design works are being carried out within digital space, not only design works, but also the processes and concepts of design are facing a new aspect, and a new form of architectural design is now being carried out. The infinite imagination of architects was restricted by various physical limits in the past, but now such restrictions are no more within digital environment. This digitalization created the new term, 'digital architecture' (Park, 2004).

The digital architecture can be defined as 'an architecture which eliminates geometrical artificiality by creating non-geometrical space, as digital information and human perception meet and handle multidimensional space' (Lee, 2001). The boundary of

digital architecture includes both things embodied within the practical world and things that only exist in the digital virtual world. Recent technologies that enable us to feel virtual reality with our senses are widely used, and in architecture it is widely used as well. Also, a new conceptual society, such as cyberspace, is being created within networks, forming a space-perceptual society which is different from face-to-face meeting in the real world (Park, 2003).

2. Characteristics of Digital Architecture

The expressive natures of modern digitalized architectural design can be seen from two perspectives. The first aspect is to use digital technology as a 'tool' of realistic synthesis of virtual reality and reality, and the second is the 'expressive' nature which enables new architectural language by applying digital technology (Kim & Jung, 2001). Although both play critical roles in determining the characteristics of digital architecture, this study tried to analyze digital architecture by focusing on the semantic and contextual characteristics, rather than on functional and conventional characteristics. The characteristics drawn out from preceding studies related to digital technology and architecture are classified in <Table 1>; the five characteristics were immateriality, interactivity, nonlinearity, liquidity, and hypersurface, although the terms used show some disparity. Cases with characteristics of digital architecture are shown in <Table 2>.

1) Immateriality

The advancement of digital technology enabled higher reinforcement of reality compared to previous reproducible media, and it resulted in the integration of reality and image. Therefore, modern architecture, where 'the image is the reality,' shows characteristics where the boundary between real and unreal is ambiguous. Toyo Ito predicted that the architects' media of construction would no more be affiliated with something material, but with a program of something immaterial (Kim, 1997). This immaterial quality of architecture is characterized as 'lightweight' or 'transparency.' The transparency in modern architecture is what eliminates materiality and tactility, holding criticism on structuralism, and it connotes the raw material's permeability, extended space, and ambiguous space boundaries (J. R. Choi, 2003). Transparency can be a property of a material such as a glass curtain wall, or a property of a structure itself (Rowe & Slutzky, 1997). Also, being lightweight within architecture can be understood as a rebound of something permanent and also an expression of something momentary at the same time. The trend of being lighter contradicts the fundamental qualification of architecture - the solid construction within gravity field and pursuit for permanence (Huh, 2001).

The 'Norddeutsche Landesbank' is built so that all sides of the building are made into façades, or the front (Fig. 1). For the quality of multi-direction, all of its sides are dressed with the transparent glass, and

Table 1. Characteristics of digital architecture

Characteristics of digital architecture analysed in previous studies						Classified characteristics of digital architecture
Kim & Jung (2001)	Huh (2001)	Im & Lee (2002)	Yeo (2003)	Kang (2005)		
-Immateriality -Discontinuity	-Immateriality		-Immateriality	-Immateriality	→	Immateriality
-Interactivity			-Interactivity		→	Interactivity
	-Nonlinearity	-Nonlinearity -Non-hierarchicality -Networkability	-Decentralization -Nonlinearity -Multi-linkability	-Decentralization -Non-hierarchicality	→	Nonlinearity
-Liquidity		-Hyperspace -Variation		-Liquidity	→	Liquidity
	-Hypersurface	-Hybridization	-Non-boundary -Hybridization		→	Hypersurface

the structure denies the work of gravity with the use of a metal frame structure (Lee, 2007). The 'Condé Nast Cafeteria' is characterized by the clear curtains of glasses used like fiber (Fig. 2). The independently curved glass panels overlap each other, so the space seen through the glass panels gives us visual distortion (Ahn, 2003).

2) Interactivity

The interactive communication methods of digital culture and pursuit for change-craving fluid-thinking brought about a form of architecture which fluidly accepts the changing environmental conditions while maintaining interaction with its surroundings. Interactivity changed architecture into a fluidic space where interactivity occurs between humans and physical environments, between buildings and outer environments, and even between humans and outer environments. Interactivity of digital architecture can be subdivided into two: the physical interaction between the user and the architecture, and the interaction between the architect and the computer. The first forms the most complicated way of interaction, meaning that the architecture itself metamorphoses under the influence of the user and surroundings (Park, 2004).

The productive and reactive sound environment of 'Son-O-House' creates a permanent interaction between sound, architecture and visitors ("DDR", 2004) (Fig. 3). This building percepts and analyses the movement and flow of visitors and the patterns of the location, creating an alive and constant flow of sound. This is a 'generative' sound environment that constantly changes and evolves by space, sound and people (Chung & Kim, 2008). 'Aegis Hyposurface' uses 896 pistons that percepts electronic stimulation created by surrounding movement, sound, light, etc. (Fig. 4). It creates a space with a constant dialogue with the outside by supplying dynamic geographical features real-time (O. M. Choi, 2003). Such cases clearly illustrate how architecture changes according to the user and surroundings. The interaction between the architect and the computer is the interaction in a wider sense. It signifies that people and computers create architectural forms as the two interact through an interface (Park, 2004). 'London City Hall' is a round

glass building with a special exterior, and gives a different sensation according to the angle of vision (Fig. 5). The designer Norman Foster created forms within virtual space to find the optimum form, simulated it, and then constructed it utilizing the computer all through the process (Yoon et al., 2007). This is a good example of the interaction between the architect and the computer that continues from architectural design to construction.
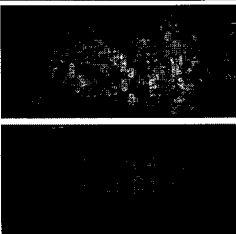
3) Nonlinearity

The idea of nonlinearity in space design is a disposition of trying to draw a line at the Euclidian geometry-centered deterministic linear-structure, which is based on circles and lines, triangles, and grids, thus trying to express new order, diversity and unexpectedness in space, on the basis of the concept of nonlinearity (Ahn, 2003). Because of expansion of nonlinear paradigm, space is now demanding extension of new concepts, and the search for modern nonlinear forms, caused by complexity, is mainly being developed by digital media. The digital technology driven by nonlinear function is becoming an ideal media that expresses today's undetermined and uncertain complex-system phenomenon through unpredictable and intricate calculation of nonlinearity (Park, 2004).

'Experience Music Project' is created by arranging the fragmented modular spaces which function independently, and then, by integrating them according to the shape and nature of each space (Fig. 6). The modular space with no order of rank moves discontinuously according to the user's selection, like movement of hypertext (Kim & Jung, 2001). 'Yokohama International Port Terminal' pursues the indeterminate space that does not follow the linear or rectangular coordinate systems (Park, 2003) (Fig. 7). Citizens and travelers are intentionally induced to make a nonlinear and disruptive interaction during their appropriation of space as each program tangles in a rhizomic way (Byun, 2005).

4) Liquidity

Digital architecture is the fluidic architecture, in which its interior and surrounding space changes according to the factors of outer environments or

Table 2. Cases with characteristics of digital architecture

Immateriality	 <Fig. 1> Behnisch, Behnisch & Partner 'Norddeutsche Landesbank' (2002)		 <Fig. 2> Frank Gehry 'Condé Nast Cafeteria' (2000)
Interactivity	 <Fig. 3> NOX, 'Son-O-House' (2004)	 <Fig. 4> dECOi 'Aegis Hyposurface' (2001)	 <Fig. 5> Norman Foster 'London City Hall' (2002)
Nonlinearity	 <Fig. 6> Frank Gehry 'Experience Music Project' (2000)		 <Fig. 7> A Foreign Office Architects 'Yokohama International Port Terminal' (2002)
Liquidity	 <Fig. 8> Marcos Novak 'TransVienna' (2000)	 <Fig. 9> Toyo Ito 'Sendai Mediatheque' (2001)	 <Fig. 10> NOX 'Soft Office' (2002)
Hypersurface	 <Fig. 11> Peter Cook & Colin Fournier 'Kunsthaus Graz' (2003)		 <Fig. 12> Peter Schmitz, Cologne 'T-Mobile headquarters' (2003)

human information data (Huh, 2001). Liquidity can be illustrated as: an attempt to express the process of metamorphosis of self-inducting space and forms for dynamically organic buildings; the concept of multi-dimensional space which is naturally evolving; the space for topological change that applies the state of organic flexibility, etc. (O. M. Choi, 2003). Also, cyber-space provides a new concept of space and time that does not have limits such as gravitation, and it transforms the structurally rigid architecture styles and space into a continuous and seamlessly integrated fluidic form and into elastic, flexible and variable space (Kim & Jung, 2001). Marcos Novak's architecture often looks fluid or viscous, and he argues that digital architecture should become liquid because it can, in the virtual world at least, flow and change in respon-sive and interactive ways (Ostwald, 2004) (Fig. 8).

'Sendai Mediatheque' is a 7-story glass building, and a metal structure tube employs equipment and facilities while also employing natural light and sup-porting the building structure (Rattenbury et al., 2004/ 2006) (Fig. 9). The basic programs of the library, art exhibition halls and audio-visual facilities are natu-rally arranged in reiteration and juxtaposition, thus the formal division of space is broken down and the borders are obscure. This enables the transposition of programs possible and makes the space fluidic (O. M. Choi, 2003). NOX's 'Soft Office' not only gives liquidity in form, but is also a fluidic working space, meaning that the seat of an employee is not fixed and can be changed flexibly (Ahn, 2003) (Fig. 10).

5) Hypersurface

The interaction between humans and the computer through interface has changed the role of building walls from a protective structure against the outer environment to an information screen. The surface of the building utilizes sensors to convert and deliver information in order to respond to the change in the outer environment, acting as an organism (Kim & Jung, 2001). This sleek stratum package design that hides this 'hypersurface' technology signifies that the building surface in modern architecture comes with another existential meaning other than the traditional decorative functions.

In the last few years, more and more large light installations have been realized in the facades of high-rises, or the buildings themselves have been used as media facades (Lieser, 2009). Each of the fluores-cent, round tubes installed in the inner part of green acrylics of 'Kunsthaus Graz' works as pixels, creat-ing a low-resolution screen on the surface to display simple images or moving texts (Fig. 11). This is a 'media façade' of the building that works as a full-scale media, and enables this space itself to deliver a message through the fusion of architecture and digi-tal media (Ahn, 2003). The 'T-Mobile headquarters' use a metal mesh facade that integrates LEDs to pro-duce an ever-changing media landscape (Fig. 12). The camera records the movement of people in the square to produce the image real-time (Chung & Kim, 2008).

III. Case Studies on Characteristics of Digital Architecture that Appear in the Contemporary Fashion Works of Hussein Chalayan

This chapter will introduce and interpret how the five characteristics of digital architecture are expressed in the contemporary fashion works of Hussein Cha-layan (Table 3). Since clothes can perform its funda-mental function only when worn by person, they have different features from architecture. However, the pro-cess of this chapter would be able to provide evidence that contemporary fashion designers, who have been experiencing directly/indirectly the technological and cultural changes by digital influence, are expressing this digital influence in the same manner as the mod-ern architects.

1. Immateriality

Immateriality is expressed through the tension among objects created by a material's property, texture or significance of surface, and through the relationship between the surface and inner-outer parts. In order to express a particular image with a certain intention, designers use materials that are not pre-utilized, and furthermore, deliberately mix various materials in pur-suit of material expressivity (J. R. Choi, 2003). To sig-

nify immateriality in fashion, designers try to break the boundary of clothing materials and fixed ideas and, just as in the case of digital architecture, immateriality can be found in transparency and lightweight.

Transparent and/ or semi-transparent materials such as plastic, glass, vinyl and etc. were used for transparency. Hussein Chalayan presented structural hats that used transparent plastic material in the 1998 F/W collection, 'Panoramic' (Fig. 13). Also, <Fig. 14> shows the translucent glass 'eggs' that covered the models' faces in his 1998 collection. The semi-transparent structural hat was presented in the 1999 S/S collection, 'Geotropics' (Fig. 15). In the 2007 S/S collection, 'One Hundred and Eleven', he presented clothing where transparent bubble shapes reiterated (Fig. 16). This work expressed not only transparency but lightweight characteristics by using transparent material.

2. Interactivity

Today, through the use of interactive traits of the digital paradigm, individual needs can be satisfied more, and furthermore, by employing human emotions in digital contents development, the possibility of fusing fashion and technology is coming into view (Lee & Kim, 2008). As in digital architecture, interactivity in fashion includes not only the interaction between the user and clothes and between surroundings and clothes, but also the interaction between the designer and the computer in design development.

First, the interactivity between the user and clothes was found in many cases, and especially, the works that create dynamic movement through the user's direct manipulation were notable. The 'Aeroplane Dress', presented in Chalayan's 1999 F/W collection, 'Echoform', contained a concealed battery, gears and wheels that were activated by a tiny internal switch operated by a model on the catwalk (Evans, 2003) (Fig. 17). 'Memory Wire Dress', presented in his 2000 S/S collection, 'Before Minus Now', was constructed with electric coils that expanded, opening like the flowers (Fig. 18). The dress was controlled by the wearer but operated independently of the body, a theme Chalayan continued to explore through technical innovation (Quinn, 2002). Second, the inter-

activity between surroundings and clothes displayed aspects of the interaction between the other persons surrounding the wearer and clothes. In his 1998 S/S show, some of the models' heads were bisected by oblong mirrors which simultaneously framed their faces and reflected the audience's faces back to them (Fig. 19). The audience, looking at the model, did not just gaze at an object, but found the object interacted with the viewer (Evans, 2003). Also, Chalayan presented the 'Remote Control Dress' in his 2000 S/S coll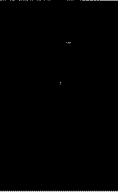ection (Fig. 20). A boy operated his remote control when a model in the pink resin dress came on stage and this time the panels of the model's dress rose serenely (Evans, 2003). Third, the interactivity between the designer and the computer was generated in the process of the designer's utilization of digital technology. In his 'Geotropics' collection, Chalayan created a micro-geography of the body in a computer animation that morphed into each other many types of national costumes (Evans, 2003) (Fig. 21). The series of 'Architectural Dresses' he designed for the 'Before Minus Now' collection featured wire-frame architectural prints against static white backgrounds, generated by a computer program that allowed designers to draw within a range of three-dimensional perspectives inside an architectural landscape (Fig. 22). The images were then transferred onto silk and cotton fabrics using a mechanized fabric-printing process (Quinn, 2002).

3. Nonlinearity

Nonlinearity forms a space of unfixed, indefinite and circulatory form, and nonlinearity in fashion can be mainly characterized by deconstructionism. Deconstructionism, to creat new things and make differences, continues to change existing combination and make a new one. Completely new things that have nothing to do with elements of clothes are arranged to form deconstruction which dismantles the traditional form of clothes and presents the possibilities of new forms of clothes. Therefore, clothes create various space and shape according to its components of material and process, and this is not a fixed or finalized method, but a process for the creation of new things (Yang & Yang, 2008). Two observations in

Table 3. Cases with the characteristics of digital architecture that appear in the contemporary fashion works of Chalayan

Immateriality	<Fig. 13> 1998 F/W	<Fig. 14> 1998 F/W	<Fig. 15> 1999 S/S	<Fig. 16> 2007 S/S
Interactivity	user ↕ clothes	<Fig. 17> 1999 F/W <Fig. 18> 2000 S/S	surroundings ↕ clothes	<Fig. 19> 1998 S/S <Fig. 20> 2000 S/S
	designer ↕ computer	<Fig. 21> 1999 S/S		<Fig. 22> 2000 S/S
Nonlinearity	<Fig. 23> 2002 S/S	<Fig. 24> 2003 S/S	<Fig. 25> 2009 S/S	<Fig. 26> 2010 S/S
Liquidity	<Fig. 27> 1999 S/S	<Fig. 28> 2000 F/W	<Fig. 29> 2000 F/W	<Fig. 30> 2003 F/W
Hypersurface	<Fig. 31> 2007 F/W	<Fig. 32> 2008 S/S	<Fig. 33> 2008 S/S	<Fig. 34> 2008 F/W

Chalayan's works were the anti-standardization through exaggeration, metamorphosis, deconstruction and reconstruction of form, and the deconstructive nonlinearity through non-consecutiveness such as removing or separating a part of a garment.

In the 2002 S/S collection, 'Media', Chalayan's deconstructed panels, zippered layers and off-kilter silhouettes came together beautifully (Fig. 23). He imagined the hexes as alternations to the garments caused by layering, twisting and cutting away sections (Evans, 2003). In the 2003 S/S collection, 'Manifest Destiny', his layered jersey dresses came with complex cutouts and bottom-hugging miniskirts. The clothes were shredded and cut away to expose layers of fabric and outline zones of flesh (Fig. 24). These dresses were the examples that aptly express the deconstruction and reconstruction of clothing elements. Also, the molded-latex one-piece dress, presented in his 2009 S/S collection, 'Inertia', had protruding back panels (Fig. 25). Also, the jacket that boldly removed the side seam, presented in his 2010 S/S collection, 'Dolce Far Niente', deconstructed clothes to express a nonlinear characteristic (Fig. 26).

4. Liquidity

Contemporary fashion is changing from the traditional structure where each part is seamed together permanently to the variable structure which freely changes according to the wearer's wants and needs. This increases the role of clothes from only one simple function, to a fusion of a variable and dynamic system with clothes, and thus, is changing the components of clothes into an open structure (Yang & Yang, 2008).

Chalayan moved outside the limits of his own discipline to collaborate with musicians, jewellers, textile and product designer (Evans, 2003). Liquidity was found in his works that utilized unexpected props or materials for clothes, and in those that applied the structure of garments itself to attempt various structural change. In 'Geotropics' collection he explored the idea of an itinerant existence, carrying a chair with a girl that she could sit on wherever she was (Fig. 27) (Evans, 2003). The 2000 F/W collection,

'After Words', featured five pieces of domestic furniture designed to transform into dresses and skirts, complete with suitcases to pack away the clothes taken off (Fig. 28)–(Fig. 29). The chairs functioned as both pieces of furniture and wearable dresses, and folded into an accordion-like skirt (Quinn, 2002).

Also, liquidity expressed through the structure of garments itself was found in the cases of using fasteners as details that create variety of silhouette. He presented clothes that transform into various shapes with the use of zippers in his 2003 F/W collection, 'Kinship Journeys' (Fig. 30).

5. Hypersurface

As in digital architecture, the surface of garments today is not only protecting the wearer, but also delivering various information and messages. Chalayan's collections especially use light to express hypersurface qualities. He presented the 'LED Video Dress' in the 2007 F/W collection, 'Airbone', in cooperation with the engineer Moritz Waldemeyer, and a membrane of 15,000 LEDs on the dress looked like a one full screen (Fig. 31). He announced the 'Laser and Swarovski Crystal Dress' (2008 S/S) (Fig. 32)–(Fig. 33). Servo motors operated the laser installed in between the crystals that decorated the dress, and it emitted a strong red light around the runway. Also, he presented clothes utilizing light in the 2008 F/W collection, 'Grains and Steel' (Fig. 34). Two models came out in mechanical dresses that sent out moving spots of light configured to symbolize the big-bang beginning of the universe.

IV. Conclusions

The advancement of digital technology is one of the core drivers of rapidly changing society. Among the three basic needs of humans, the fields of architecture and fashion are especially utilizing digital technology to augment productivity and efficiency, and also architects and fashion designers are using its expressive characteristics as an element to present their new attempt. This study analysed how the characteristics of digital architecture tend to be revealed

in the contemporary fashion works of Hussein Chalayan, and aims to forecast in what ways the modern fashion is going to unfold.

As a result of this study, it was possible to classify the characteristics of digital architecture into five groups - immateriality, interactivity, nonlinearity, liquidity and hypersurface; in addition, all of these characteristics were found in the works of Hussein Chalayan. Chalayan's design combines two heterogenous areas of fashion and architecture into one, and thus creates new art works which transcend the existing concept and aesthetic senses. His clothes, made of plastic, resin, and transparent glass, express the immateriality. They also cause the interactivity between clothes and wearers, and between clothes and the other persons surrounding the wearer, by operating switch or remote control. Nonlinearity can be seen in his design, by the deconstructed and reconstructed form, and such nonlinearity forms a space of unfixed, indefinite, and circulatory form. Sometimes his clothes turn into a chair, and his furniture transforms into a dress or a skirt; such liquidity gives us a new perspective and perception about fashion and architecture. He changed the concept of fashion by using light and LED videos, expressing hypersurface that delivers various information and messages. His creative design that fuses fashion and architecture, and his utilizing of various materials and digital technology are the expression of the various digital characteristics of today. His innovative design, which has the artistic aesthetic, and, at the same time, transcends the fixed ideas, can be the well-timed design that reflects the trend and the cultural code of this digital era.

Thus in this rapidly changing digital era, fashion and architecture build the complementary relationship. Architects and fashion designers living in this same age are utilizing digital technology not only as a tool, but also the fundamental and semantic expressive elements of digital paradigm in the process of expressing their ideas in architecture or clothes. Such digital influence will continue to strengthen through further advancement of digital technology, and the digital paradigm will continue to influence modern architecture and fashion in functional and/ or expressive terms.

Therefore, designers who actively utilize these digital characteristics in fashion, not only can create new form and function, but also can create new aesthetics for the arts.

The limitations of this study are; more systematic research is desired because few preceding researches interrelating fashion and digital architecture were found; not all works of contemporary designers were analyzed except Chalayan's. It is also proposed that supportive studies on digital characteristics in fashion be continued.

References

Ahn, H. J. (2003). *Analysis of architectural form and design reflecting nonlinear paradigm: Focus on the characteristics of nonlinear concept and formative principles.* Master thesis, Yonsei University, Seoul.

Byun, G. S. (2005). An analysis on the indeterminate approach in contemporary architecture through the rhizome thought. *Journal of the Regional Association of Architectural Institute of Korea, 7*(2), 45–52.

Choi, J. R. (2003). *Fluxus gallery planning based on dematerial concept.* Master thesis, Hongik University, Seoul.

Choi, O. M. (2003). *A study on plasticity in representational characteristics of digital architecture.* Master thesis, Pukyung National University, Pusan.

Chung, J. W., & Kim, M. D. (2008). A tendency in contemporary space design with digital sense-Focus on the analysis of digital media art-. *Journal of Korean Society of Design Science, 21*(3), 17–28.

DDR (Digital design of revolution) III: Nox | Nox-Son-O-House. (2004, July). *Architecture and Culture,* pp. 154–173.

Evans, C. (2003). *Fashion at the edge: Spectacle, modernity, and deathliness.* Connecticut: Yale University Press.

Huh, J. S. (2001). *The characteristic aspects of space design in digital architecture.* Master thesis, Dankook University, Seoul.

Im, J. H., & Lee, M. S. (2002). A study on design trend of digital architecture. *Journal of the Korean Architectural Society, 22*(2), 291–294.

Jang. A. R. (2002). Experimental design on Hussein Chalayan's works. *Journal of the Korean Society of Costume, 52*(5), 91–107.

Kang, H. (2005). *Digital · Design · Architecture.* Pusan: Bionhoo.

Kang, H., & Lee, D. E. (2004). A study on the limits and overcoming of Greg Lynn's digital form creation method. *Journal of the Architectural Institute of Korea, 20*(11), 41–50.

Kim, H. Y. (2000). A study on deconstructed space and visibility in clothes.-Regarding Hussein Chalayan's design-. *Journal of the Korean Society of Costume, 50*(4), 5–20.

Kim, H. Y., & Hur, D. S. (2005). A study of the formative characteristics in architecture and fashion of the modernism period. *Journal of the Korean Society of Costume, 55*(4), 62–78.

Kim, K. S. (1997). The architecture of Toyo Ito. *Ideal Interior, 11*, 132–133.

Kim, S. W., & Jung I. H. (2001). A study on the representational characteristics of digitalized architectural design. *Journal of the Korean Architectural Society, 21*(2), 363–366.

Kwon, Y. G. (1999). A study on the dematerializing tendency in contemporary space design. *Form, 22*, 8–20.

Lee, C. J. (2001). Digital architecture & liquidizing form. *Architecture, 45*(9), 24–28.

Lee, S. M. (2007). *A study on fluid expression characteristics of digital space-Focusing on Deleusze's formation reason-.* Master thesis, Kookmin University, Seoul.

Lee, Y. K., & Kim, M. J. (2008). The development of fashion design with Korean images using digital media-3D modeling based on Maya (Qualoth) program-. *Journal of the Korean Society of Costume, 58*(6), 42–53.

Lieser, W. (2009). *Digital art.* Königswinter: H. F. Ullmann.

Ostwald, M. J. (2004). Freedom of form: Ethics and aesthetics in digital architecture. *The Philosophical Forum, 35*(2), 201–220.

Park, J. I. (2004). *A study on the non-linearity in the digital architecture.* Master thesis, Konkuk University, Seoul.

Park, N. G. (2003). *A study on the expanded architectural realm by the mobility of cyberspace.* Master thesis, Yonsei University, Seoul.

Park, S. M., & Lee, J. J. (2008). An observation on characteristic of architectural paradigm in twentieth century fashion design. *Journal of the Korean Society of Costume, 58*(2), 78–92.

Quinn, B. (2002). *Techno fashion.* Oxford and New York: Berg.

Quinn, B. (2003). *The fashion of architecture.* Oxford and New York: Berg.

Rattenbury, K., Bevan, R., & Long, K. (2006). *Architects today* (J. S. Lee, Trans.). Seoul: Kukjebook. (Original work published 2004)

Rowe, C., & Slutzky, R. (1997). *Transparency.* Basel: Birkhäuser.

Yang, H. Y., & Yang, S. H. (2006). A study on the architectural paradigms expressed in fashion since 1990s. *Journal of the Korean Society of Costume, 56*(7), 85–100.

Yang, H. Y., & Yang, S. H. (2008). A study on the formative characteristics of the qualative continuity expressed in contemporary fashion. *Journal of the Korean Society of Costume, 58*(1), 116–132.

Yeo, S. H. (2003). *A study on the processes of space design in the digital era.* Master thesis, Konkuk University, Seoul.

Yoon, J. K., Chi, K. S., Kim, Y. H., Kim, C. E., & Byun, G. S. (2007). *Modern & contemporary architecture.* Seoul: Kimoondang.

Yun, J. Y. (2009a). An analysis of the fashion collection of Hussein Chalayan. *Journal of the Korean Society of Costume, 59*(1), 77–93.

Yun, J. Y. (2009b). Distinctive and common characteristics of fashion works, as influenced by national·cultural contexts-Focusing on the works of Vivienne Westwood, Issey Miyake and Hussein Chalayan-. *Journal of the Korean Society of Costume, 59*(2), 111–127.