



**Digital matte painting as a reflective practice: the creative process of a Chinese
exquisite imperial palace of the Qing Dynasty**

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RÉSUMÉ

Cette étude explore ma matte painting numérique comme une pratique réflexive. Le matte painting est l'une des plus anciennes techniques de réalisation cinématographique et elle joue toujours un rôle important dans la post-production hollywoodienne. Mais, ce domaine a manqué de compréhension du phénomène dans la communauté universitaire. Tant que praticien du matte painting numérique, j'ai remarqué que les éléments asiatiques dans la production et la post-production hollywoodiennes sont souvent problématiques. Cette étude cherche à offrir une compréhension plus approfondie du matte painting numérique. Pour ce faire, j'explore par cette étude comment mon expérience professionnelle, ma perspective culturelle et mes approches d'interprétation peuvent influencer mon processus de matte painting numérique. J'appelles ce processus « la pratique DMP ». L'enquête sur mon processus réflexif (Schön, 1983) est basée sur la création du DMP d'une structure Chinoise de palais impérial de la dynastie Qing. Parallèlement au concept d'orientalisme (Said, 1979), je prête attention à l'utilisation des éléments visuels et des symboles pour éviter les stéréotypes. Sous la direction d'une méthode d'autoethnographie, je décris un processus de création de modèles 3D et une séquence de retouche/peinture de photos avec des photos existantes de référence d'architecture symbolique chinoise. La conclusion principale de la recherche est d'intégrer la dimension culturelle dans le processus de création. Sur la base de mes découvertes, je réfléchis à la manière dont les praticiens DMP pourraient faire de même, afin de disposer de meilleurs outils cognitifs pour comprendre le sens et le but fondamentaux de la représentation d'objets chargés de culture et d'histoire. Pour la formation professionnelle en DMP, cela pourrait susciter une discussion sur les connaissances interdisciplinaires et la prise de conscience culturelle impliquées dans cette pratique intégrée.

Mots clés : matte painting numérique, pratique réflexive, architecture Chinoise, Orientalisme, les effets visuels, post-production

ABSTRACT

This study explores my digital matte painting as a reflective practice. Matte painting is one of filmmaking's oldest techniques and it still plays an important role in Hollywood post-production. However, there is a lack of understanding of the digital matte painting phenomenon in the academic community. As a digital matte painting practitioner, I noticed that Asian elements in Hollywood production and post-production are often problematic. This study seeks to offer a deeper understanding of digital matte painting. To do so, I explore throughout this study how my professional experience, cultural perspective, and approach to interpretation can influence my digital matte painting process, which I call "DMP practice". The investigation of my reflective process (Schön, 1983) is rooted in the creation of a DMP about a Chinese Qing Dynasty imperial palace structure. In line with the concept of "Orientalism" (Said, 1979), I pay attention to the use of visual elements and symbols to avoid stereotypes. Under the guidance of an autoethnographic method, I describe a 3D model creation process and a photo patching/painting sequence with reference to existing photos of Chinese symbolic architecture. The main finding of the research is bringing cultural consideration into the creation process. Based on my findings, I reflect on how other DMP practitioners could do the same. They could have better cognitive tools for understanding the core meaning and purpose when representing culturally/historically charged artifacts. For DMP professional training, this could spark a discussion on cross-disciplinary knowledge and awareness of cultural perspective involved in this embedded practice.

Keywords: digital matte painting, reflective practice, Chinese architecture, Orientalism, visual effects, post-production

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LIST OF ABBREVIATIONS

UQAC: UNIVERSITÉ DU QUÉBEC À CHICOUTIMI

NAD: ÉCOLE DES ARTS NUMÉRIQUE, DE L'ANIMATION ET DU DESIGN

VFX: VISUAL EFFECT

DMP: DIGITAL MATTE PAINTING

3D: THREE-DIMENSIONAL

2D: TWO-DIMENSIONAL

AO PASS: AMBIENT OCCLUSION PASS

ID PASS: IDENTIFY PASS

DEDICATION

This paper is dedicated to my research supervisor, Dave Hawey.

Thanks to teachers and students at the School of Digital Arts, Animation and Design (NAD Center), UQAC.

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INTRODUCTION

Context and Research Subject

Matte painting is one of the oldest techniques in filmmaking and it still holds an important role in Hollywood post-production. Matte painting consists of photorealistic oil painting on large sheets of glass. Matte painters oversee the creation of the painting to match the live-action footage.

Famous matte paintings for example in the movie “*Star Wars: Return of the Jedi*”[®] (1983), represented stormtroopers standing in this Michael Pangrazio painting of the Death Star docking bay. The left image below is the original matte painting created by artist Christopher Evans and the right image below is the final composite.

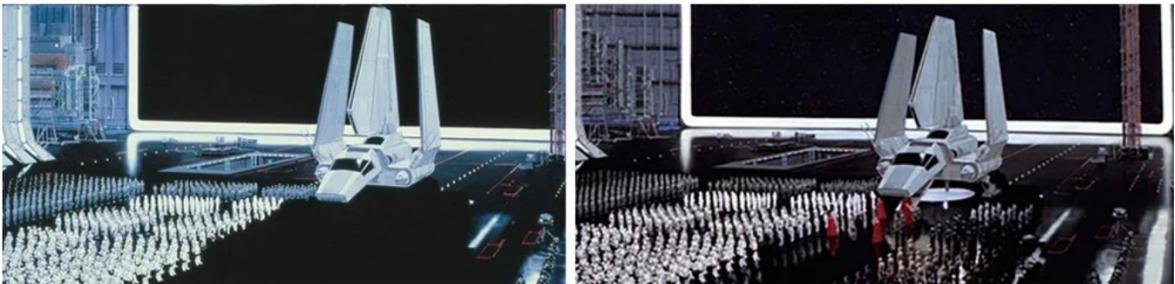


Figure 1 Image captured from the movie “*Star Wars*” (1984) ©Walt Disney Studios Motion Pictures

Matte painting has become more prevalent in the film industry thanks to the development of digital post-production technology. Digital matte painting is close to its traditional version except it is made by creating 3D models with 2D painting and photo patching techniques using a graphic tablet. The image below is a great example of a digital matte painting, it is a landscape from “*Avatar*”[®] (2019) done by Yannick Dusseault, a graduate student from NAD Center.



Figure 2 Image captured from the movie "Avatar" (2019) ©20th Century Studios

However, I find that there are not many academic articles about matte painting in the field of visual effects, and they are often confused with traditional painting or digital painting.

As a digital matte painter with more than a decade of work experience, I started my learning journey with a basic traditional painting skill at UQAC's NAD Center back in the fall of 2009. During these three years of intense study, I developed a strong interest in digital environment creation and digital matte painting techniques. After graduation, I was recruited as an environment generalist by the Emmy award-winning Rodeo FX studio. Six months later, I transferred to their digital matte painting department for more training and work. More recently, I have worked with the Oscar-winning Framestore studio, Cinesite studio, the Moving Picture Company and other world-leading visual effects companies as a digital matte painting artist. Now I am a senior digital matte painting artist at the Outpost visual effects company. During this time, I have participated in the production of many popular movies and TV series such as "*Game of Thrones*"[®] (2014), "*Blade Runner 2049*"[®] (2017), "*Maleficent: Mistress of Evil*"[®] (2019), etc. In addition, I was born and raised in China for two decades.

My childhood and adolescence were influenced by traditional Chinese culture, giving me a very good understanding of my culture of origin. This allowed me to notice that Hollywood production and post-production often employ stereotypes and lack consideration of Oriental culture in the filmmaking process.

The present study focuses on the creative process of representing traditional Chinese architecture. The reference project consisted of producing a digital matte painting of a Chinese Qing Dynasty imperial palace structure, combining 3D models and existing photos of Chinese symbolic architecture.

This study aims to make the following contributions. I wish to offer an embodied and situated account of the digital matte painting reflective process. It will hopefully spark discussions in the emergent academic field of digital matte painting. I wish to offer an account of cultural and historical considerations in digital matte painting practice, in this case referring to Chinese architecture.

Conceptual Framework

The research investigates my reflective process (Schön, 1983) in creating a digital matte painting of a Chinese Qing Dynasty imperial palace structure. I am guided by Schön's professional artistry concepts which are 'knowledge-in-action', 'reflection-in-action', and 'reflection-on-action'. I examine my creative process with Schön's concepts of "appreciative system" and "repertoire" to explore how professional experience and cultural awareness affect the result. Along with the concept of "Orientalism" (Said, 1979), I pay attention to the usage of visual elements and symbols to avoid stereotypes. Through the lens of these concepts, I try to grasp the logical significance of digital matte painting creation and the impact of cultural and historical elements in my creation.

Methodology

The study will use qualitative inquiry as the research strategy. Since our research subject is the practice of digital matte painting creation, I will also use research-creation in art as our methodology. Under the guidance of an autoethnographic method, I describe a 3D model creation process and a photo patching/painting sequence using existing photos of Chinese symbolic architecture as references. Self-observation and field notes are my data-collecting tools.

Structure

This paper is split into five chapters. Chapter one describes the literature review of matte painting and the phenomena of Asian elements in Hollywood production. I raise the research problem and discuss its goal. In chapter two, I mainly introduce Schön's conceptual framework for reflexive practice and his professional artistry concepts, along with two other important concepts, "appreciative system" and "repertoire". I also introduce Said's concept of Orientalism. In chapter three, I present the method of research-creation in art and define the qualitative inquiry as the strategy of my study. And I discuss the specific method used in the practice. Chapter four describes the digital matte painting creative process along with the interpretative analysis. Chapter five provides the final interpretation and answers the research question that we raised at the beginning of the study. We conclude with a discussion on possible future studies.

CHAPTER 1

THE PROFESSIONAL PRACTICE OF DIGITAL MATTE PAINTING

Chapter 1 is divided into three sections. The first section includes literature review and introduces matte painting's history and evolution. Also, it mentions the digital matte painting's position and function within the visual effects industry in Hollywood post-production. The second section describes the status of Asian elements in Hollywood films. Two case studies expose problems faced by Asian culture, with respect to the Western market. In the last section, I combine all the above sections to talk about the research problem and its objective.

Section 1 — Digital matte painting practice

As the review of literature on “matte painting” shows a significant amount of academic works, ones regarding matte painting or digital matte painting in visual effects more specifically remain limited. Indeed, the latter often got mixed with traditional painting on the canvas or digital painting on Photoshop. Some relevant articles refer to matte painting as a tool to discuss other subjects. And others article more look like workshop tutorial without the support of conceptual framework or deep analysis. Please find APPENDIX-1 for the result of literature review. Only a few articles or books explain and record the history and development rigorously of matte painting in detail. Some articles are relevant to my subject but comparing with the book based on my professional knowledge and experience, I decided to focus on the books so that I could be more precise about the “matte painting” topic. I consider the two main books, i.e., “*The VES Handbook of Visual Effects Industry Standard VFX Practices and Procedures*” by Okun & Zwerman (2020) and “*The Invisible Art: The Legends of Movie Matte Painting*” by Vaz & Barron (2002). The reason for considering these two books is that they have been cited many times in relevant literature and the authors have extremely rich professional backgrounds.

The first book was created by a group of people who come from The VES Society¹ . According to its website, this group “is a nonprofit professional, honorary society dedicated to advancing and promoting the art and science of visual effects and to foster and strive for excellence and knowledge in all matters about visual effects.” Each chapter in the book was authored and created by a few pioneers or industry leaders in the field of visual effects, and both editors were two important VES members. The first editor is visual effects supervisor Jeffrey.A.Okun who has worked in the field for more than 30 years. He has contributed to a variety of movies and television shows, including “*The Last Samurai*”[®] (2003), “*Deep Blue Sea*”[®] (1999), and “*Stargate*”[®] (1994). The second editor is a producer, Susan Zwerman. She has been producing movies and television for more than 25 years and has worked on several films from the Marvel[®] franchise and “*Star Wars*”[®] (2019). The VFX industry comprises many disciplines. As a handbook for the industry, the book must describe all disciplines. So, the descriptions of each discipline must be limited in some way. The result is the same for the matte painting discipline. Consequently, there is no way in this book to go deep into the specific details.

The second book, “*The Invisible Art: The Legends of Movie Matte Painting*” (Vaz & Barron, 2002), is exclusively dedicated to the matte painting profession. It is a collaboration between Mark Cotta Vaz, a professional author and film historian, and Craig Barron, an Oscar-winning visual effects supervisor. Barron is also the first professional scholar to bring matte painting to an international professional conference. At the 1998 SIGGRAPH

¹ <https://www.vesglobal.org/>

conference², he explained how matte painting reacts in digital form (Barron, 1998). In his book, Barron describes in detail the invention of matte painting and its evolution. He interviewed directors, matte painters, cameramen, and other relevant experts, and described in detail the shooting process of many well-known movies and the creation process of matte paintings. However, the book has significant limitations that prevent a richer and deeper understanding of the practice of digital matte painting. Firstly, as the book mainly describes the case of cooperation between photographic technology and matte painting, it makes little mention of how matte painters create paintings, what difficulties they encounter during the process, and how they solve them. Secondly, the book's brief mention of digital matte technology does not explain its technical principles in detail but only lists famous digital matte painting pictures.

The two books mentioned state that Norman Dawn created the first matte painting on glass in the 1907 movie "*California Missions*"[®], which film he also directed. Almost a century later, Barron explained: "Traditionally, matte paintings were made by artists using paints or pastels on large sheets of glass for integrating with the live-action footage." (Barron, 1998, p.318). This was the very first time that matte painting was made known to the public through professional academic presentations. The academic recognition of matte technology was delayed for a very long time. In the past one hundred years, "*The Invisible Art*" is one of a very few pieces of academic literature that we can refer to. Our research indicates that "*The*

² <https://en.wikipedia.org/wiki/SIGGRAPH>

Invisible Art” (Vaz & Barron, 2002) remains the only serious work on matte painting in academic literature.

Although there are few academic literature sources related to matte painting, its important position in film creation cannot be ignored. In the foreword of *“The Invisible Art”* (Vaz & Barron, 2002), the renowned American director, producer, and creator of “*Star Wars*” ® series and “*Indiana Jones*” ® series, George Lucas, said: “Matte painting is one of the enthralling aspects of the cinematic arts. Many of the most memorable moments in the history of cinema have come to us with the help of matte paintings. From the beginning, the art has allowed filmmakers to magically transport their audiences to other times and places, to voyage into futuristic worlds, to experience previously unimagined places of fantasy.” (Lucas, in Barron, 2002, p. 11) In addition, “*The VES Handbook of Visual Effects Industry Standard VFX Practices and Procedures*” (Okun & Zwerman, 2020) reinforced matte painting's prestige in the profession:

“Matte painting has been and always will be a vital ingredient in expanding the scope of filmmakers’ visions, regardless of technology. It is a necessary element in the filmmaker’s toolbox. Matte paintings transport the audience to past eras or take them deep into the future to discover new and exciting worlds. They make it possible for filmmakers to keep production costs down and to give scale and importance to settings. Matte paintings are needed so viewers can see clearly. They are needed to tell viewers where they are.” (Okun & Zwerman, 2020, p.497).

The importance of matte painting in the creation of films is highlighted by the phrases above. Early traditional matte painting provided filmmakers with greater creative options, resulting in more engaging and inventive films. As technology advanced, we gradually shifted from the antiquated practice of creating matte paintings on glass at the filming location to doing the whole digital matte painting totally on a computer. In the next section, we present a deeper explanation of traditional matte painting and digital matte painting.

1.1.1 Towards digital matte painting

So far, the ideas presented help to understand that traditional matte painting was not recognized in academic circles until a hundred years after its invention. During the past hundred years, traditional matte painting has been presented in movies in different ways through the ingenuity of film directors. For instance, according to George Lucas: “The technology of matte painting continues to evolve, and the art form itself grows more essential to cinema. It all started with artists creating physical paintings and marrying them with celluloid in a variety of ways: glass paintings, hanging paintings against a live-action scene, in-camera latent images, or “original negative” paintings.” (Lucas, in Barron, 2002, p. 11)

The traditional matte painting was one of the important elements of many film productions in the last century. These traditional matte paintings were made by artists using paints or pastels on large sheets of glass for integration with live-action footage (Barron, 1998) and most of them are oil paintings. In the 1930s and 1940s, the movies “*The Wizard of Oz*” ® (1939) and “*Xanadu*” ® (1941) used traditional matte painting. In the late 1970s and 1980s, many traditional matte paintings were created to realize many whimsical scenes for the earliest movies of the “*Star Wars*” ® (1977) and “*Indiana Jones*” ® series. Near the end of the twentieth century, Christopher Evans, one of the greatest traditional matte painters, created the last painting in the movie “*Titanic*” ® (1997). He ended the era of traditional matte painting. It is a pity that there is only one academic document to record such an important and miraculous film post-production technology.

Traditional and digital procedures both involve the artist's entire expertise and talents in lighting, compositing, detailing, and realism. This is what traditional and digital techniques

have in common. The distinction between these two procedures is that the original fixed lens shooting and drawing technique is less flexible than the digital one. Today's environmental mapping uses digital projection technologies to display its effects more in a 2.5D or 3D representation to make the entire area more three-dimensional and realistic. As a result, digital matte painting has long since eclipsed traditional drawing in today's film and television production.

There has been significant enthusiasm for digital matte painting in the film industry. For instance, George Lucas wrote a beautiful paragraph to summarize it in "*The Invisible Art*". He said: "Now, with the advent of digital technology, we have the tools to create even more astonishing imagery. Matte painting has become the basis of the "virtual set" approach that I have had the delight to explore, and which is becoming more and more the filmmaking approach of the future." (Vaz & Barron, 2002). Digital matte painting, supported by 3D technologies, has been very positively received as a way of replacing traditional techniques: "Paint has now been superseded by digital images created using photo references, 3-D models, and drawing tablets. Matte painters combine their digitally painted matte textures within computer-generated 3-D environments, allowing for 3-D camera movement." (Barron, 1998, p. 318) This statement provided a first impression of digital matte painting and a commonly accepted definition. A later work, "*The Digital Matte Painting Handbook*" (Mattingly, 2011), was authored by David B. Mattingly, an American illustrator and painter, former head of the matte painting department at Disney Studio and now he is the professor of Pratt Institute and School of Visual Arts He worked on some famous films, such as "*The Black Hole*" ® (1979), "*Tron*" ® (1982), and "*I, Robot*" ® (2004), etc. Mattingly's book introduces digital matte technology and a prior understanding of the process of creating a matte painting, with teaching tips and tricks. Although this book is a significant contribution

to scholarly literature, it does not mention the source, background, and significance of digital matte creation. Since this latest contribution, it seems that literature on digital matte painting has remained scarce.

The contribution of traditional matte painting and digital matte painting has remained significant in Hollywood production to the present day. Matte painting has been used in many older and more recent “*Star Wars*”[®] series television series and “*Indiana Jones*”[®] series films to produce a variety of environmental scenarios. Today's film and television dramas frequently use digital matte painting because of its unique ability to veer between 3D and 2D. Numerous digital matte painting masterpieces were created for the well-known TV show “*Game of Thrones*”[®] (2011). In the Academy Award-winning movie “*Darkest Hour*”[®] (2017), people might not be aware of the intensive use of digital matte painting to recreate Buckingham Palace's overall design and the British environment of the 1940s and 1950s. Digital matte painting gives directors more room to play with camera movement and environment creation, and the cost is also significantly lower than traditional matte painting.

Many digital matte creations are constantly being presented to the audience with the update of movies and TV series. Meanwhile, the technology of digital matte painting is constantly evolving thanks to scientific and technological progress. However, the development of academic literature about digital matte painting has been very limited. The gap in the field makes us worry about the future of digital matte painting academic development.

1.1.2 Limitations of existing knowledge about digital matte painting

According to Dario Lanza: “matte painting --- a term that encompasses the various techniques for the creation of cinematographic landscapes and scenery through painting --- has received surprisingly little attention from researchers.” (Dario, 2020, pp. 80). On top of that, existing knowledge poses significant limitations. We understand that Barron (2002) pioneered the cognition of matte painting, using many interviews as the academic support of his book and recorded the history of matte painting. Barron (2002) demonstrated the importance of matte painting in movie production. However, the three books mentioned above examined do not provide a thorough understanding of film digital matte painting’s practice, in terms of production process, solutions, and reflections. More specifically, these books mainly focus on the technical expertise or artifactual dimension of the digital matte painting practice.

Referring to Schön’s epistemology of practice (1983), these books as primary references in the field don’t provide any account of the context of the post-production environment or the practitioners’ reflection through work in progress. Therefore, there is a lack of thorough understanding of the practice and its complexity, i.e., the situated and embodied professional knowledge of practitioners. In other words, how digital matte painters think about and use their technical skills remains enigmatic; we know very little about why they do it and what are their motivations.

The interest in technical training for digital matte painting can be seen in the large number of tutorials and courses available for purchase online (e.g., thegnomonworkshop.com and Pluralsight.com) as well as the vast quantity of free videos on YouTube and Google. All these instructional videos are aimed at teaching technical skills

and focus on the technical dimension of practice. These videos do not present the complexity of the production of a film or television series, as may occur in the social and structural context of the industry's real settings. By tackling (technical) problems that are too specific, they do not present a sufficiently holistic view to raise the often more fundamental social, ethical, and institutional issues involved.

Since these videos and tutorials don't cover the entire process of creating a digital matte painting, we refer to Schön (1983), stating that dealing with complex and unique situations calls upon the professional practitioner's artistry, subjectivity, and judgment rather than just her prior knowledge and a predefined problem or solution. In this respect, there is a need to better understand digital matte painting practice beyond "technical rationality" (Schön, 1983), i.e., to obtain an account of her situated reflective process, not just an account of her technical tools and predefined steps and methods. Since I will explore this in subsequent chapters, the following section seeks to delineate a complex situation through which to investigate my practice of digital matte painting.

Section 2 — Problematic representations of East Asian elements in Hollywood production

In my personal and professional experience, there are many stereotypes and much Orientalism in Oriental-set films produced by Hollywood, both in pre-production and post-production. As a Chinese student and immigrant worker in Canada, I have observed how Chinese culture has changed in the Western film and television visual effects sector. I hope that as someone who straddles these two cultures, I can use my knowledge and insight to understand the significance and connotation of Oriental aspects in Western visual effects. The problematic situation (Schön, 1983) stems from the doubt and discomfort I feel about

the visible lack of understanding of Chinese culture in Hollywood productions. This feeling has prompted me to carry out further research as part of my practice.

1.2.1 Orientalism in Hollywood filmmaking

East Asian elements have long been featured in Hollywood filmmaking. The earliest elements to appear in Hollywood movies were seemingly Asian actors, followed by Asian architecture or environments. As times changed, Asian food, festivals, culture, ideas, etc. appeared in subsequent films. The Palestinian American professor of literature at Columbia University Edward Said argues in his book "*Orientalism*" (1979): "Orientalism (is) a Western style for dominating, restructuring and having authority over the Orient." (Said, 1979, p.3) The professor of Geography at the University of St Andrews in Scotland Joanne Sharp also supports Said's concept, "The continuity of Orientalism into the present can be found in influential images, particularly through the Cinema of the United States, as the West has now grown to include the United States." (Sharp, 2023, p.25)

The problem of Orientalism has existed for a long time. In Hollywood movies in the 1920s and 1930s, filmmakers used white actors to play Asian roles, while real East Asian actors played very low-level roles such as prostitutes or servants. One of the best examples of this is the 1929 film "*The Mysterious Dr. Fu Manchu*" ® (1929), in which the filmmakers chose a European actor to play the cunning, sinister Dr. Fu Manchu. In the 1950s and 1960s, Pedro Iacobelli, a political and cultural circulationist and Asian studies professor, critiques the film "*The Teahouse of the August Moon*" ® (1956) through the lens of Orientalism. He mentioned the film "tells us more about the Americans and the American's image of Okinawa rather than about the Okinawan people." (Iacobelli, 2011, pp.25-26). In the mid-20th century, non-Oriental actor played Mr. Yuniوشي, a short-sighted bookworm with buck teeth, in the

well-known movie "*Breakfast at Tiffany's*"[®] (1961). The embodiment of this kind of image makes it hard to believe that there is no stereotype of East Asians in the director's mind. Later in the last century, stereotypes in American cinema still didn't seem to have changed at all. The 1984 film "*Once Upon a Time in America*"[®] (1984), depicts America in the 1920s. The movie opens with a hidden drug scene in Chinatown. In recent years, more and more East Asian elements have been presented in Hollywood movies, but we can still glimpse traces of stereotypes. Associate editor Dino-Ray Ramos of DEADLINE³, one of the most followed Hollywood news reporting websites, pointed out⁴: "While there has been progress in the representation of Asian actors in TV shows and films through *Crazy Rich Asians* and *Fresh Off the Boat*, the portrayal of stereotypes is still a present issue." (Dino-Ray Ramos, 2017). The famous Japanese manga "*Ghost in The Shell*"[®] (1989) was remade into a movie by Hollywood in 2017. The principal role in this remake was played by well-known American actress Scarlett Johansson.

The above examples aim to show that the stereotypes of East Asian elements in Hollywood film production are often negative, hidden, evil, and so on. Additionally, Hollywood does not appear to be paying enough attention to criticism from academic circles and continues to produce Hollywood Oriental films with pure Orientalism. Although the globalization of the world has evolved and the Western world's stereotypes of the Eastern world have improved, there are still many areas for improvement.

³<https://deadline.com/>

⁴<https://deadline.com/2017/09/asian-americans-in-television-study-diversity-representation-inclusion-master-of-none-fresh-off-the-boat-1202165584/>

1.2.2 Chinese elements in Hollywood movies

The representations of Chinese culture in Hollywood often leans heavily on stereotypes. Anna May Wong was the first Chinese American actress in Hollywood. She was affected by this phenomenon, and she chose to leave Hollywood in 1928 to continue her career in Europe. “Even though [Anna May Wong] was internationally known by 1924, her film roles were limited by stereotype and prejudice. Tired of being both typecast⁵ and passed over for lead East Asian character roles in favor of European-American actresses, Wong left Hollywood in 1928 for Europe.” (Chan & Anthony B, 2003, p. 42). Meanwhile, Hollywood in its early years had already shown a conservative attitude towards Chinese elements, especially Chinese actors, as they let European and American actors play Asian characters. For example, Swedish-American actor Warner Oland played some famous Chinese characters in Hollywood movies, such as “*The House Without a Key*” ® (1926), “*The Mysterious Dr. Fu Manchu*” ® (1929), “*Charlie Chan Carries On*” ® (1931) and “*Shanghai Express*” ® (1932).

Hollywood has also demonstrated a specific stereotype about architecture. It was influenced a lot by U.S. Chinatowns. “Stereotypes of the Chinese in America were perpetuated by the otherness of U.S. Chinatowns in the late 1800s and early 1900s, where people had different customs” pointed out Elizabeth Lee, multimedia reporter and producer for Voice of America. (Lee, 2019) One of Hollywood's favorite uses of Chinese architecture are buildings that resemble pagodas or temples. This is the signature Chinese architecture that appeared in U.S. Chinatowns. The most well-known examples are the animated features “*Mulan*” ® (1998) and “*Kung Fu Panda*” ® (2008), the live-action version of “*Mulan*”

⁵ https://en.wikipedia.org/wiki/Portrayal_of_East_Asians_in_American_film_and_theater

® (2020), and the Marvel ® series movie “*Shang-Chi*” ® (2021). All the above films and most Hollywood productions include architectural features such as curved roofs, decorative finials, ornate facades, and symmetry. These features visually present to people Chinese traditional architecture, but Hollywood does not understand the intrinsic meaning of those architectures. These visually distinctive architectural styles serve a functional purpose. For example, the curved roof is to delay the rain, and the decorative spire is to hide the ugliness of the lightning rod. Since Hollywood doesn't understand these effects, they will visually exaggerate them. For instance, they will increase the arc of the roof or omit roof decorations, etc. “They never realize the effort that Chinese people try to mediate these two cultural interests in the exotic features. Nor will they spend time investigating the truth of the context in which the story took place. They often conclude the story from their own imagination and confirm to the Western Orientalist’s construction of China as mythical and patriarchal.” (Chen, Wang, Li, Li, Qi, 2017)

Recently, China has become a market for Hollywood to win over due to the growth of its economy and its population. As stressed by *The Hollywood Reporter*⁶: “It’s official: China is home to the world’s biggest movie box office” (Brzeski, 2020). The rise of China's economy and the high box office rate of movies brought about by it have made Hollywood continue to produce movies with Chinese or Oriental elements. “With more and more positive Chinese cultural elements appearing in the Hollywood’s movies, the real image of China has been known by more and more westerns, but It is still not enough.” (Chen, Wang, Li, Li, Qi, 2017) In short, the more Oriental elements are involved in the film, the bigger the risk of fully reflected cognitive gaps.

⁶ <https://www.hollywoodreporter.com/>

1.2.3 Misunderstandings of Chinese culture in Hollywood production: two case studies

Since I started working in film and television post-production in 2012 in Canada, I have begun to pay attention to Hollywood's treatment of Asian elements, mainly focusing on traditional Chinese elements. Because digital matte painting is a visual effects method that focuses on the environment, this led me to focus mainly on Chinese architecture. I've been observing how Chinese architecture is portrayed in Asian Hollywood movies over the years. I grew more conscious of the significance of the symbols and artifacts graphically depicted in Hollywood films, of how an ignorance of them may lead to cultural and historical mistakes and misrepresentations, and of how the industry's predominately western culture might misread them.

As many examples of Hollywood productions could serve as representations of Westerners' stereotyped images of the Orient, I will choose to focus on two movies: "*Indiana Jones and the Temple of Doom*" ® (1984) and "*Mulan*" ® (2020). Although one of the two examples above dates from the 1990s and the other from the new century, it appears that the persistent perception of the Orient has not changed that much over the previous 30 to 40 years. The Orientalism narrative in Hollywood movies is substantial and serious. Let's explore Orientalism in more detail.

1.2.3.1 — The architectural elements in Indiana Jones and the Temple of Doom

In the 1980s, the "*Indiana Jones*" ® series films were all the rage in the United States. But there is Orientalism in this series of films. Let's look at the beginning scene of the movie

“Indiana Jones and the Temple of Doom” ®. There is a big gap between the Shanghai nightclubs in the 1930s and the environment shown in the movie. Below I will combine my research about Shanghai nightclubs in 1935 and relevant historical materials to analyze the Orientalism demonstrated in this movie.



Figure 3 Image captured from the movie “Indiana Jones and the Temple of Doom” (1984) ©Walt Disney Studios Motion Pictures



Figure 4 Image captured from the movie “Indiana Jones and the Temple of Doom” (1984) ©Walt Disney Studios Motion Pictures

The start of the film is identified as Shanghai in 1935. An extravagant ballroom and restaurant of that kind could only be found in Shanghai's European Concession at that time since Shanghai was still in the early stages of the Second World War. The area consists

primarily of European-built structures. In one portion of downtown Shanghai today, there are still a lot of buildings like this, and they largely do not mix with traditional Chinese architecture. Therefore, without any architectural characteristics and a plain, contemporary design, the movie's stone statues of warriors or Buddha on either side of the stage seem particularly out of place in comparison to the European opulence that is supposed to permeate it. The Paramount Nightclub in Shanghai's European Concession is shown in the 1933 image below, which allows us to compare it in more detail. The nightclub has two floors, with plenty of room in the center along with high, delicate ceilings, and is very spacious, as is evident. From what is depicted in the film, this is a totally different aesthetic.



Figure 5 Paramount Hotel Ballroom © Shanghai Sojourns

“Indiana Jones and the Temple of Doom” ® (1984) is a movie from the year of 1984. Nearly 30 years have passed, but the Orientalism produced by Hollywood has not lessened at all. Even in the movie *“Mulan”* ® produced in 2020, there are still many mistakes.

2.2.3.2 — The architectural elements in Mulan

The recent movie “*Mulan*” ® (2020) is live-action version of the 1998 Disney animated feature of the same name, about a Chinese woman who takes the place of her father in the army. This movie provides a very good example of traditional Chinese architecture. The production team or director of the film were certainly heavily influenced by Orientalism. The movie demonstrates how several well-known Chinese features, which include the Fujian Tulou, Phoenix, Great Wall, Tang Makeup, Baxian Table, and Qi Gong, are thrown together without any rhyme or reason.

The character Hua Mulan lived in the Northern Wei Dynasty from the fourth to the sixth century CE, according to history, while Fujian Tulou didn't appear until the Song Dynasty in the twelfth century. People ate while seated on the ground during the Northern and Southern Dynasties, hence there was no Ba Xian Table at that time. Disney describes Hua Mulan's Qigong as a Western witch's technique for concealing the strength of the night. The slogan "loyalty, bravery, and truth" is frequently used, but Mulan's commitment to honor is more akin to that of a European knight. Even though the Mulan movie was filmed in China, North American companies did all the visual effects. To finish this “Chinese style” movie, artists from all around the world were gathered. It's possible that while creating visual effects, artists followed the wrong advice from the pre-production team and just have a basic understanding of China. There would undoubtedly be significant variances in knowledge level.

Some important architectures depicted in the movie demonstrate several cultural dissonances. Indeed, the film's understanding of architectural tones deviates, the roof features are not rigorously constructed, and the main building's harmony with the other backdrop structures is doubtful. These problems may be one of the main reasons directly

leading to the dismal box office of the film. Although there is much variation in the overall understanding of the building, the production team did not pay enough attention to the details for a movie that represents a Chinese story and aims to earn a Chinese box office profit. Even if Hollywood were to develop such a work, likely, the Chinese would not pay for it.

The first dissonance comes from the way the buildings are placed. The image below (Figure 4) demonstrates how packed the space between the buildings is. Despite being a wealthy city core, the placement of buildings is examined considering China's historical national might. Most buildings, apart from the Forbidden City, should be bungalows, with low ceilings and sparsely detailed roofs.



Figure 6 Image captured from the movie "Mulan" (2020) © Walt Disney Studios Motion Pictures

A second dissonance is that the Northern Song Dynasty's capital was depicted in the image below by a Chinese painter. The size of the structures and the bridges can be seen, and the presentation of these structures in the film Mulan does not correspond to the style and shape of their roofs. The palace is the tallest building and most of the folk structures are small, although there are numerous tall structures in the Mulan movie. It's unfortunate to think that the production team sacrificed reality for the film's aesthetic appeal.

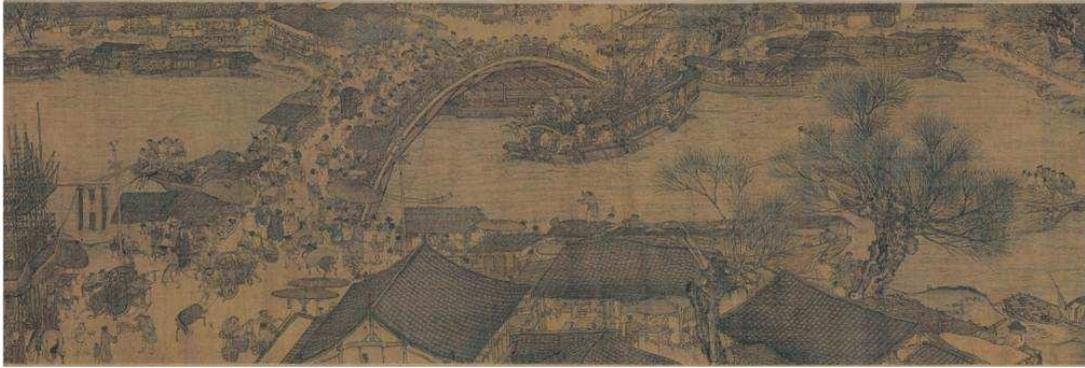


Figure 7 Along the River During the Qingming Festival © Zhang Zeduan (1085-1145)

A third dissonance is that the pavilion in this image below (see Figure 8) is where the royal family rests. It is the building on the right. This building has a lot of issues as well. Let's first observe the pillars supporting this pavilion. Apart from a few of the palace's pillars, which will be embellished with dragons, most of the pillars of old Chinese buildings are red.



Figure 8 Image captured from the movie "Mulan" (2020) © Walt Disney Studios Motion Pictures

The wooden beam structure that connects the pavilion to the roof is the second. Many royal buildings feature this wooden beam system; however, it is typically only visible on the roof. This structure is designed to hold the weight of the entire roof. It is difficult to see at the bottom of the building, or it might only be partially exposed. The entire building's wooden

beam structure is visible in the film. This is a structural issue, and the wooden beam structure's color and other elements do not match the period's creative aesthetic.



Figure 9 Photo captured © meiyou324980



Figure 10 Image captured from the movie "Mulan" (2020) © Walt Disney Studios Motion Pictures



Figure 11 Image captured from the movie “Mulan” (2020) © Walt Disney Studios Motion Picture

What is particularly surprising in the movie is how they handled the Royal Palace. There has never been a royal hall in Chinese history that employed pure gold to embellish the beams when you consider all the buildings that have existed there. The filmmakers also decided on gold for the beams that support the roof's top. The style the ancient Chinese emperors used to display greatness was most certainly not like this. On the other hand, during previous Chinese dynasties, imperial residences were built using dragon totems.



Figure 12 Image captured © dpm.org.cn



Figure 13 Photo captured © Liba.com

The production designer of *Mulan* movie told the reporter of *Architecture Digest*⁷ that “they based designs on the Tang dynasty era but didn’t stick to that”. And he also mentioned that “it’s a Disney movie, so everything should look romanticized and family-friendly”. From the above description, it is hard to believe that the architecture in the movie *Mulan*® (2020) is not influenced by Hollywood stereotypes.

1.2.4 Summary

I have noticed a lot of stereotypes and misunderstandings in Oriental films produced by Hollywood, with serious production and post-production problems. Since I am more connected to and have a better understanding of Chinese culture, I came to delineate a problematic situation to investigate: the Chinese architectural elements represented in digital matte painting.

⁷ <https://www.architecturaldigest.com/story/inside-the-sets-mulan-live-action>

Section 3 – Research objective and question

So far, I have presented the available knowledge on digital matte painting practice from academic literature and pointed to its scarcity and limitations. As I described the use of Asian elements in Hollywood film production, I pointed out the Orientalism problem and formulated a problematic situation regarding the use of Chinese elements of architecture. I now conclude this first chapter by formulating the research objective and question. In this study, I explore and seek to understand my deployment of traditional Chinese elements of architecture in film post-production, by taking research “through” practice approach (Frayling, 1993). Therefore, as a researcher-practitioner in my field, I investigated the digital matte painting creation of a Chinese exquisite imperial palace of the Qing Dynasty. I give an account of my creation process, understood as a design-like reflective conversation with the situation (Schön, 1983). This theoretical perspective allows me to look at, describe, and analyze my reflective practice. As Schön’s conceptual frame provides relevant themes/concepts that help to give meaning to professional knowledge, I will particularly focus on my “repertoire of precedents” and my “appreciative system” during my creation process, i.e., two concepts that will be combined and enriched with Said’s concept of Orientalism. This conceptual framework will be presented in the next chapter. This leads to the research question that will guide this study: “What is the reflective process in my digital matte painting process, in creating a Chinese exquisite imperial palace of the Qing Dynasty?” This question will be refined later at the end of Chapter 2, after presenting the theoretical perspectives of the study. This study aims to make the following contributions. I wish to offer an embodied and situated account of the digital matte painting reflective process. This will hopefully spark discussions in the emergent academic field of digital matte painting. I wish to offer an account of cultural and historical considerations in digital matte painting practice, in this case relating to Chinese architecture.

CHAPTER 2

THEORETICAL PERSPECTIVES OF THE STUDY

This chapter presents the lens that guided our investigation throughout practice and our process of analysis of the data collected. This chapter seeks to define the reflective process in professional practice and how we can make sense of it. The first section introduces Schön's epistemology of professional practice. Subsections will touch on two specific concepts: repertoire of precedents and appreciative system. The second section will address Said's concept of "Orientalism", a guiding concept throughout my practice that has helped to frame the problematic situation investigated.

Section 1 – Schön's conceptual framework

During the 1980s, the late American philosopher and MIT professor Donald Schön sought to understand professional knowledge, especially among those who face new, unique, and uncertain situations. This led to his seminal 1983 book on the same subject entitled *The Reflective Practitioner: How professionals think in action*, which had a profound impact on both the design field and the education field. Schön remarks about professional knowledge, that professionals have difficulties explaining their knowledge.

2.1.1 Epistemology of practice

According to Schön (1983), the epistemology of practice is an alternative way of acting aimed at overcoming an initial way that he calls "technical rationality":

If the model of Technical Rationality is incomplete, in that it fails to account for practical competence in "divergent" situations, so much the worse for the model. Let us search instead for an epistemology of practice implicit in the artistic, intuitive processes which some practitioners do bring to situations of uncertainty, instability, uniqueness, and value conflict (Schön, 1983, p. 49).

In this sense, for professionals, technical rationality consists of wanting to apply ready-made solutions to problems that have already been defined, of dealing with a problematic

situation by setting aside its complex, divergent, and unique nature, and of seeking to act in a rigorous, objective rather than relevant and subjective way. Schön argues that some professionals prefer to take an alternative approach, i.e., to enter a reflective conversation with the situation; to frame it, possibly reframe it, process it, clarify it, and ultimately transform it into a version deemed satisfactory. In addition, the epistemology of practice includes understanding and recognizing the knowledge produced and the reflection applied by practitioners in practice. It is this (re)constructed knowledge that enables practitioners to resolve, clarify and transform problematic situations. This concept can be applied to researchers who study other practitioners, or they can set them up as practitioners and study their subject matter. No matter which kind of study, the core of the theory is an analysis of the distinctive structure of reflection-in-action.

2.1.2 Professional artistry

Schön (1983; 1987) explains “professional artistry” in more detail in his 1987 book *“Educating the Reflective Practitioner”*. Professional artistry is all about the intelligence, wisdom, and ingenuity of the professional. This manifests itself, for example, when a professional ventures into the swamps of her practice, when she sets a problem that escapes technical rationality because of its unique and unstable nature. At this point, it is impossible to fit the characteristics of the problematic situation into pre-established categories or to solve a problem by applying an existing technique. The professional has no other recourse than using her judgment that is based on processes not necessarily logical, but more intuitive and subjective.

Schön (1983) structures professional artistry around three central concepts: 'knowing-in-action', 'reflection-in-action', and 'reflection-on-action'. At first glance, the professional

possesses "knowing-in-action", i.e., tacit, ordinary knowledge and know-how often applied unconsciously; this includes the actions (gestures), identifications, and judgments (assessments) that she knows how to make very spontaneously. This body of knowledge is often well integrated into routines and habits as part of one's practice. This knowledge forms the basis of how professionals design, frame, and evaluate the situations, representations, and artifacts associated with their practice. However, as it is often tacit, knowing-in-action can be difficult to explain and make explicit.

According to Schön, professionals "reflect-in-action" when they tackle a situation. For example, they first think about the unique and intriguing phenomenon or situation in front of them. They make an initial frame or diagnosis of the situation and consider which behaviors to adopt to tackle it. Their framing of the situation leads them to carry out an experiment to test their initial understanding and the envisaged solution. Within this reflective process, surprising effects or states are significant:

"In each instance, the practitioner allows himself to experience surprise, puzzlement, or confusion in a situation which he finds uncertain or unique. He reflects on the phenomena before him, and on the prior understandings which have been implicit in his behavior. He carries out an experiment which serves to generate both a new understanding of the phenomena and a change in the situation." (Schön, 1983, p.68)

This experimentation can lead to surprises or emergencies, which can lead the practitioner to want to (re)frame and launch new experiments. It is in this sense that Schön uses the metaphor of "reflective conversation with the situation" to understand the iterative and qualitative process at the heart of this form of inquiry. This process ends when the practitioner has found a satisfactory solution or has dealt with or clarified a situation to the point where it is no longer considered problematic. So "reflection-in-action" is happening during professional activities, the practitioner is often less conscious about the situation.

Schön (1983) argues that professionals "reflect on their actions" when the situation is over or in the past. At this point, professionals explore the reasons why they act the way they did or how events unfolded. This overlaps with what are commonly asked of professionals, i.e., to be able to reflect on and give meaning to their actions concerning a situation they have encountered, which can be a way of generating important knowledge. So "reflection-on-action" is happening after professional activities, the practitioner is more conscious about the situation or the result.

During the process of "reflective practice", I would like to highlight two more concepts that would help my research, which are "appreciative system" and "repertoire". I will explore more in the following sections.

2.1.3 Appreciative system

The "appreciative system" and "repertoire of precedents" of professional practitioners are also integral parts of the structure of their reflection-in-action. Schön (1983) mentions that in a professional reflective situation, appreciative systems are involved in problem setting, evaluation of inquiry and reflective conversation.

A practitioner's ways of framing a situation, or problem, or seeing effects, surprises, and emergencies during her investigation, are largely rooted in her appreciative system. This refers to her mental schema, i.e., a system of beliefs, values, and norms for making positive or negative judgments. She makes these judgments tacitly, without being able to identify the criteria according to which they are made. In this case, she modulates the value she places on one or other element of the problem situation; she judges the problem posed

by the quality and direction of the reflective conversation in progress; her assessment of her experiments will be based on her ability to resolve or clarify the problematic situation, on her appreciation of the unexpected effects of her actions, and on her ability to create a coherent artifact and/or a comprehensible idea. Her appreciation and understanding of this coherence may lead to further investigation.

2.1.4 Repertoire of precedents

In professional practice, when practitioners try to solve a problem or a situation, they use their experience to evaluate or analyze and they try to find a solution. This experience is what Schön (1983) refers to as the concept of “repertoire”. It can exactly refer specifically to examples, pictures, understandings, actions, expectations, techniques, meanings, expertise, etc.

“During their practice, I try to find similarities with past cases in new problems by searching through their repertoire of precedents”. This is what Schön (1983) mentioned in the book, “seeing this situation as that one, one may also do in this situation as in that one,” practitioners will compare old inquiry with new inquiry. According to Schön (1983), practitioners can specifically identify similarities and differences with past inquiries. They can solve the new inquiry by adjusting their repertoire “because of the differences in feel for media, language, and repertoire, the art of one practice tends to be opaque to the practitioners of another” (Schön, 1983, p. 271).

As the practitioner encounters more problems, her experience becomes greater. Many times, even in new cases that appear to have no similarities with previous cases, experienced practitioners can identify similarities or familiarities:

“It is our capacity to see unfamiliar situations as familiar ones, and to do in the former as we have done in the latter, that enables us to bring our past experience to bear on the unique case. It is our capacity to see-as and do-as that allows us to have a feel for problems that do not fit existing rules.” (Schön, 1983, p. 140)

Whenever a practitioner solves a new problem or inquiry, this series of solutions and experiences will be updated in the practitioner's repertoire. Over time, practitioners' repertoire and experience will become broader and deeper. In my own professional experience, this is also the process of how practitioners transform from a junior to a senior.

Section 2 – The concept of Orientalism

In the previous chapter, I mentioned the stereotypes about the Far Orient, especially China, occurring in Hollywood movies. The West's incomprehension, distortion, and fabrication of the Orient are evidenced in films. The above series of phenomena are described by the concept of Orientalism. The word “Orientalism” has existed for some centuries and has many different meanings. I will first explore those meanings and then analyze the meaning that is consistent with our research direction.

2.2.1 The word “Orientalism”

The first meaning is that the word Orientalism mainly refers to all concrete or abstract people and things related to the Orient. One of the explanations in Collins dictionary is “knowledge of or devotion to the Orient” or “any Oriental quality, style, or trait.”⁸ We can also refer to Said's explanation in his 1979 book “Orientalism” (Said, 1979). He mentioned that

⁸ <https://www.collinsdictionary.com/dictionary/english/orientalism>

one of the meanings of Orientalism was academic interpretation. All academic research or literature about the Orient can be called “Orientalism”. The word here does not praise or criticize, it is relatively neutral.

The second meaning of Orientalism is more about a point of view. Orientalism here mainly manifests itself in the West’s perception of the Orient. From the Cambridge Dictionary, Orientalism is “Western ideas about the Middle East and about East and Southeast Asia, especially ideas that are too simple or not accurate about these societies being mysterious, never changing, or not able to develop in a modern way without Western help.”⁹ In this interpretation, we can identify the Western prejudice against the Orient. Another explanation in Collins dictionary also emphasizes that Orientalism is “a viewpoint, as held by someone in the West, in which Asia or specif. The Arabic Middle East is seen variously as exotic, mysterious, irrational, etc. Term used to impute a patronizing attitude”. This is consistent with the point we made in the previous chapter, but it is not exhaustive.

The third meaning was proposed by Said. He has a special understanding and analysis, which I touched on in section 1.2.1. We will elaborate more on this in the next section.

2.2.2 The Orientalism of Edward Said

In section 1.2.1, I mentioned Said argues that the Western world was using its power to dominate, restructure, and control the Orient. Although Orientalism has been discussed for many years, no one has proposed a concept as unique as Said's. The concept of

⁹ <https://dictionary.cambridge.org/dictionary/english/orientalism>

Orientalism garnered the most attention and in-depth discussion in the academic community. More and more scholars supported and clarified that concept. Like British historian Alan Bullock and American author, filmmaker, and musician Stephen Trombley mentioned in their book:

“Orientalism is a 1978 book by Edward W. Said, in which the author establishes the term "Orientalism" as a critical concept to describe the West's commonly contemptuous depiction and portrayal of The East, i.e. the Orient. Societies and peoples of the Orient are those who inhabit the places of Asia, North Africa, and the Middle East. Said argues that Orientalism, in the sense of the Western scholarship about the Eastern World, is inextricably tied to the imperialist societies who produced it, which makes much Orientalist work inherently political and servile to power.” (Bullock & Trombley, 2000, p.617)

On top of all that, Said also emphasized that in the post-Enlightenment period, European culture could manage and even create imaginative interpretations of Eastern politics, society, military, ideology, and science. He analyzes from a historical and cultural perspective that before Second World War, Britain and France were the leading perpetrators of Orientalism. After World War II, the comprehensive national strength of the United States rose sharply, and the United States assumed a leading role in this issue. (Said, p.3)

Because of early geographical restrictions and other conditions, knowledge of the Orient is more like a myth or a made-up story to the West. So, the West projects a lot of their assumptions onto the concept of the East. They also naturally condescendingly describe the East. Even as geographical constraints improved over the years, this distorted idea became deeply ingrained in the West. Said tried to explain the occurrence of and development of this phenomenon in his book *Orientalism*.

“Orientalism, therefore, is not an airy European fantasy about the Orient, but a created body of theory and practice in which, for many generations, there has been a considerable material investment. Continued investment made Orientalism, as a system of knowledge about the Orient, an accepted grid for filtering through the Orient into Western consciousness, just as that same investment multiplied – indeed, made

truly productive – the statements proliferating out from Orientalism into the general culture.” (Said, 1979, p.6)

Section 3 – Synthesis

This chapter has set forth the theoretical framework of my research and aimed at providing a thorough understanding of what is reflective practice and how it will be applied in the research. Schön’s professional artistry and his two other concepts of appreciative system and repertoire will be used to analyze specific phenomena in the DMP process. These concepts will help to explain how artists encounter their problems and solve them during the creative process. Another important concept in this chapter is Said’s Orientalism. This concept guides my reflective research/practice process and helps me (re)construct a more critical stance on the Western way of doing/understanding Oriental things in DMP practice. It will also be used to analyze cultural phenomena that appear during the practice.

The presentation of Schön’s concepts led to refining the research question: “What is my reflective process, in terms of repertoire and appreciative system, in my practice of digital matte painting creation of a Chinese exquisite imperial palace of the Qing Dynasty?”

To answer the research question above, we need to combine a theoretical framework and methodology. We have now established our theoretical framework, and we will discover our methodology in the next chapter.

CHAPTER 3

METHODOLOGY

Combining what we have presented and formulated in chapters 1 and 2, this chapter focuses on how to effectively implement my research through practice and introduces the methodological approach used for my digital matte painting practice.

Section 1 – General approach of research-creation

I refer to research-creation as the main approach to explore my practice. Also, I refer to qualitative research from social sciences as a complementary approach to the project to describe, explore, and analyze my subject research.

3.1.1 Research creation in art

In Canada, “research-creation” is an emergent category within the social and humanities. In Britain and Australia, this is typically framed as “practice as research” (Barrett and Bolt, 2010), whereas in the U.S., it is called “arts-based research” (Leavy, 2009) and/or rolled into discussions regarding “creative arts PhDs” (Elkins, 2009). In Quebec, “recherche-création en art” has been tackled by researcher-practitioners through different collaborative works, for example, Bruneau & Villeneuve (2007) and Gosselin & Le Coguiec (2006).

According to Bruneau & Villeneuve (2007), the primary object in research-creation is “artistic practice,” which focuses “on the internal structure, on an experience, on certain components of this practice, or its process” (p. 65, informal translation by the researcher). Furthermore, the work of art, or artifact, that accompanies the practice can be “observed, described, dissected, analyzed, compared, and situated about an artistic, pedagogical approach, or from the perspective of social, political, or cultural context” (p. 66, informal

translation by the researcher). This is very close to what Chapman and Sawchuk (2012) define as research-creation:

“theses” or projects typically integrate a creative process, experimental aesthetic component, or an artistic work as an integral part of the study. Topics are selected and investigated that could not be addressed without engaging in some form of creative practice, such as the production of a video, performance, film, sound work, blog, or multimedia text.” (Chapman and Sawchuk, 2012, p. 6)

In this research, the practice of digital matte painting creation is the process by which art is created. It includes the production of 3D models and 2D photo painting and patching sequences. This research aims to produce knowledge focused on action and the development of applied knowledge, prioritizing my practice as the field of investigation.

In addition, as the authors mention that contemporary research-creation is often associated with new media experimentation, I used 3D software to model the architecture and later integrated several photos to create a new realistic image.

Both my research and practice processes refer to reflective practice (Schön, 1983). Thus, through my creation, it will be a matter of making my knowledge explicit and linking it to theoretical foundations in exploring the research problem. The production of my digital matte painting serves as a mediator between theoretical demonstration and practice.

3.1.2 Qualitative study and principles

Through my practice, I have explored a complex, human, and cultural phenomenon drawn from my own personal and professional experience, which aligns with several principles of “qualitative research” (Creswell, 2009; Merriam & Tisdell 2016; Leedy & Ormrod, 2015; Bryman, 2012). Indeed, I also draw from this type of research method, which

is mostly used in education, design, art, creation, etc., and which is closely related to human consciousness. Qualitative research commonly requires continuous study and in-depth investigation by researchers in related domains. It is among the best research approaches in the creative and social sciences fields.

Qualitative research states the purpose and research questions in an open-ended way to capture the participants' experiences. (Creswell, 2014, p.16) I seek to observe my professional behavior to understand the meaning of why I am doing that action or movement to achieve the result. By observing my own reflective practice, I can understand my thinking mode, how I establish problems, think about problems and solve problems. I can also notice elements neglected in my usual practice.

As a researcher and experienced practitioner, I identified a complex phenomenon when creating a digital matte painting, including Orientalism effects, photoshop techniques, the use of filmmaking experience, etc.

Qualitative research focuses on the combination of research phenomenon and theory, which matches the phenomenon studied with theoretical logic; and it emphasizes individual cognition and experience.

One important principle is the emphasis on words rather than numbers (Bryman, 2012; Merriam & Tisdell, 2016). According to Merriam and Tisdell (2016), qualitative research aims to gather and analyze non-numerical (descriptive) data to gain an understanding of individuals' social reality, including understanding their attitudes, beliefs, and motivation." In

my study, I mainly used descriptive data to understand and explore my digital matte painting creation process.

Section 2 – Data collection

In my research, the data collection relies on autoethnography, on-set observations and field notetaking in a journal or logbook.

3.2.1 Autoethnography method

My research draws on the autoethnographic approach, understood as an investigative process characterized by its inductive approach developed *through* and *by* practice (Bruneau & Villeneuve, 2007, p. 167). To better understand my practice and the phenomenon of interest, I have adopted an interpretive approach to my creative process, in a descriptive and narrative form, to give meaning to the data collected daily and rigorously in my practice journal (Baribeau, 2005). The research practice journal serves “explicitly as a data collection instrument” to allow one to “look at oneself as another... and traces of this can be found both in the description of the data and in the analyses.” (Baribeau, 2005, p. 111, informal translation by the researcher) I have objectivized my perceptions and critically examined the value of a problematic situation based on taking notes through my subjective impressions and my objective observations. This autoethnographic tool has allowed me “to see and appreciate the links between the collected data and the analyses performed [and also ensure] the internal validity of the research process.” (Baribeau, 2005, p. 111, informal translation by the researcher of the author)

3.2.2 On-site observations and field notes

On-site observations and field notes are happening at the same time while I am doing my practice. “The researcher takes field notes on the behavior and activities of individuals at the research site.” (Creswell, 2009)

The field notes method is used to record my actions and thoughts during my practice. To better express all my analysis about the creative process, I also captured my temporary process. “While collecting data, many qualitative researchers also begin jotting notes – sometimes called memos – about their initial interpretations of what they are seeing and hearing.” (Leedy& Ormrod, 2013, p.277). Field notes recorded all my reflections during the practice. Reading the field notes after the practice can also help me to generate new ideas, questions, concerns and other related thoughts.

Section 3 – Data analysis in qualitative research

The on-site field notes and captured screens are the main data that I will be using for data analysis. “The process of data analysis involves making sense out of text and image data.” (Creswell, 2009, p.171). The theoretical framework will be used as guidance to help me analyze the data. Even before the data collection, I already had a very rough analysis in my mind. When I began collecting data, I was simultaneously processing and analyzing it in my mind.

“It is an ongoing process involving continual reflection about the data, asking analytic questions, and writing memos throughout the study. I say the qualitative data analysis is conducted concurrently with gathering data, making interpretations, and writing reports.” (Creswell, 2009, p. 171)

When the data collection is completed, we will start a full analysis with the text notes and visual materials. According to the theoretical framework explained in the previous chapter, the data will be mainly analyzed in two dimensions. One is the concept of an

appreciative system, and the other is the concept of the repertoire of precedents. Schön's reflective practice concept will be applied overall in the data analysis. Said's Orientalism concept will also be integrated when there is a strong sign of culture influence in the process.

Section 4 – Synthesis

This chapter has described the methodology of my research. It provides tools that I will be using to develop the results of my study. The research-creation approach supports me to create a piece of art along with my study. The qualitative strategy provides me with documentation of my creation process under scientific guidelines. Autoethnography, on-site observation, and field notes are specific methods that I use to collect my data. I will combine the theoretical framework with methodology to make a complex interpretive analysis of my study. This analysis hopes to answer the research question that I state here: "What is my reflective process, in terms of repertoire and appreciative system, "What is my reflective process, in terms of repertoire and appreciative system, in my practice of digital matte painting creation of a Chinese exquisite imperial palace of the Qing Dynasty?"

CHAPTER 4

DESCRIPTION AND ANALYSIS OF THE CREATIVE PROCESS

This chapter presents the entire progress of our digital matte painting practice. I will describe and interpret the creative process.

Section 1 – Basic Information about DMP practice

In this study, DMP practice is used to create a new matte painting of the imperial palace of the Qing Dynasty in China. It uses a 3D model as a base and integrates a certain amount of edited photography of Chinese symbolic architecture.

The DMP practice takes place in my study room. The whole process uses the 3D software Blender ® to create the model and Adobe Photoshop CS ® to create the digital matte painting.

The entire process (see Table 1) lasted about a month and a half, but the actual creation time was about ten days. I need to note here is that I am a full-time employee and part-time student. I used my spare time on weekends to complete this creation. This is my deliberate decision because this intermittent creation method allows me to generate new reflections and ideas every time I return to the project and review it.

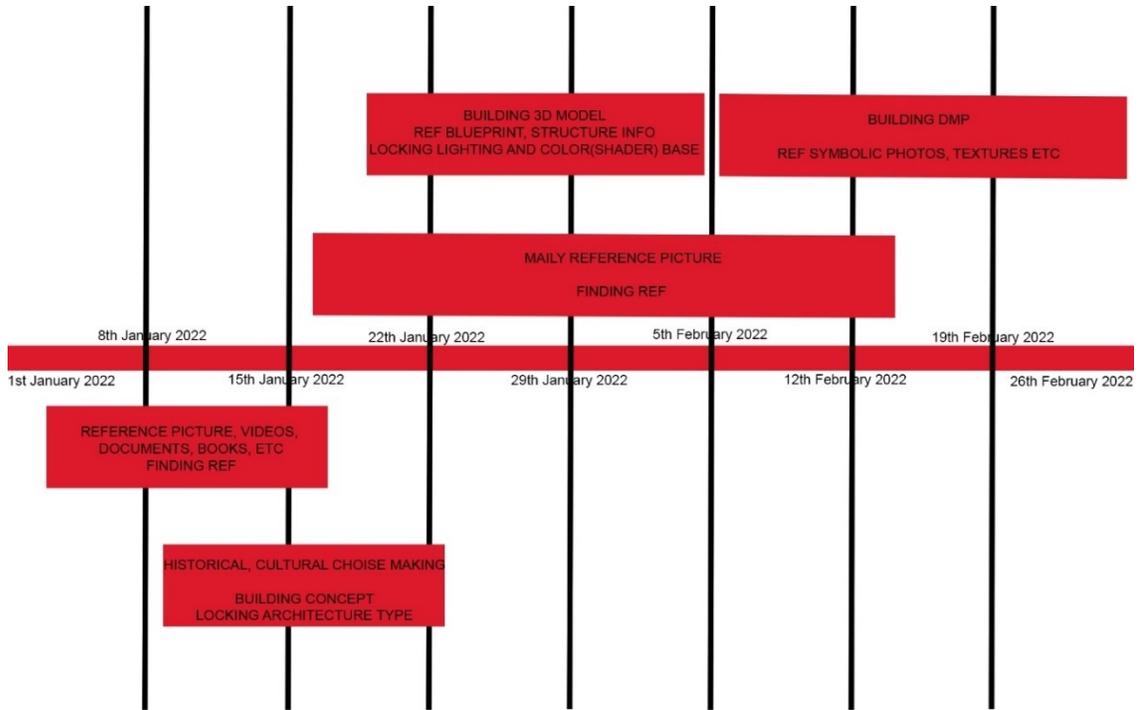


Table 1 the digital matte painting practice timeline

To explain the entire project process (see Table 2) from a simple perspective, it includes reviewing literature, materials and references, then building models and creating digital matte paintings. But each step supports each other and moves forward, and there will also be some cyclical processes, especially the process of finding image references. This is a gradual process. As the work continues to advance, new pictures need to be added. The table below shows an overview of the entire production process.

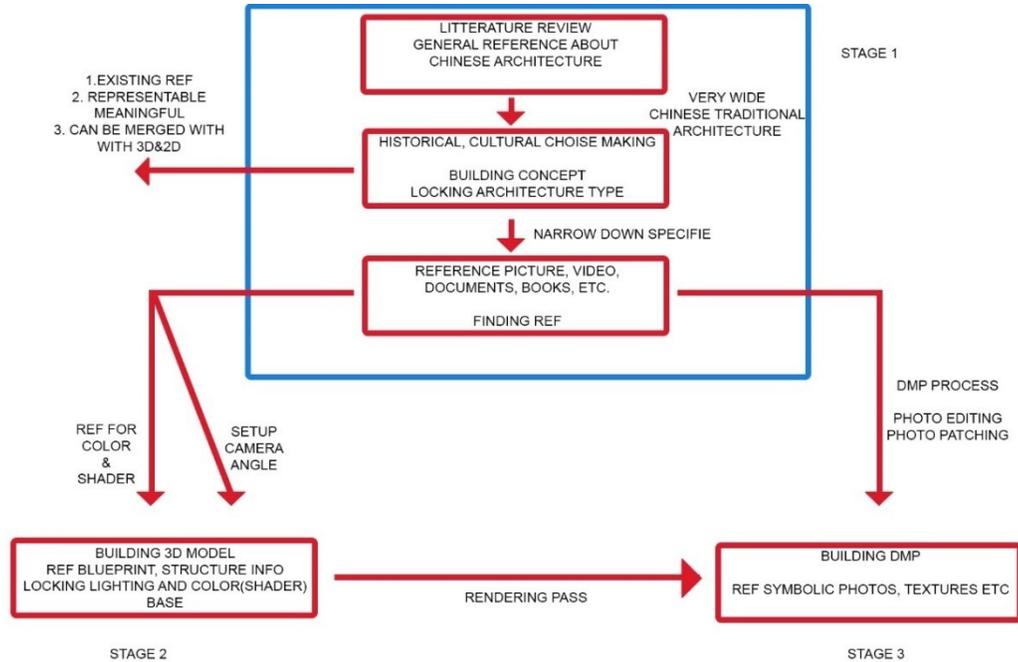


Table 2 a general outline of the digital matte painting practice

Section 2 – The description and analysis of the DMP practice

The whole creative process can be roughly split into four stages. The first stage is collecting materials. The second stage is building a 3D (three-dimensional) model. The third stage is modifying the 2D (two-dimensional) textures which is the DMP stage. The final stage is to compose the result of the DMP process. However, each stage is not completed independently but overlaps with other steps. Regarding this point, Table 2 presents this phenomenon in more detail. A basic narrative and analysis will be given of the early and middle stages to help understand the premise of the entire exercise. The focus of this study is the 2D (two-dimensional) texture modification process in Photoshop, which is the third stage of the DMP process. A large part of this chapter will describe this third-stage process.

4.2.1 The description of the first stage

The earliest stage of the project is material collection. This step occurs throughout the entire study. This type of material includes related pictures, videos, books, etc. I divided all the materials into three categories. This first category is used to determine the general direction of digital matte creation, such as the architecture age, style, and cultural background. Please see Figure 14. The second category is used for 3D modeling, such as drawings of related buildings and information about architectural details. Please see Figure 15. The third category is related to digital matte painting, such as special cultural symbols and textures of the architecture. I will explain the third type of material collection in detail in conjunction with the third stage of the practice.

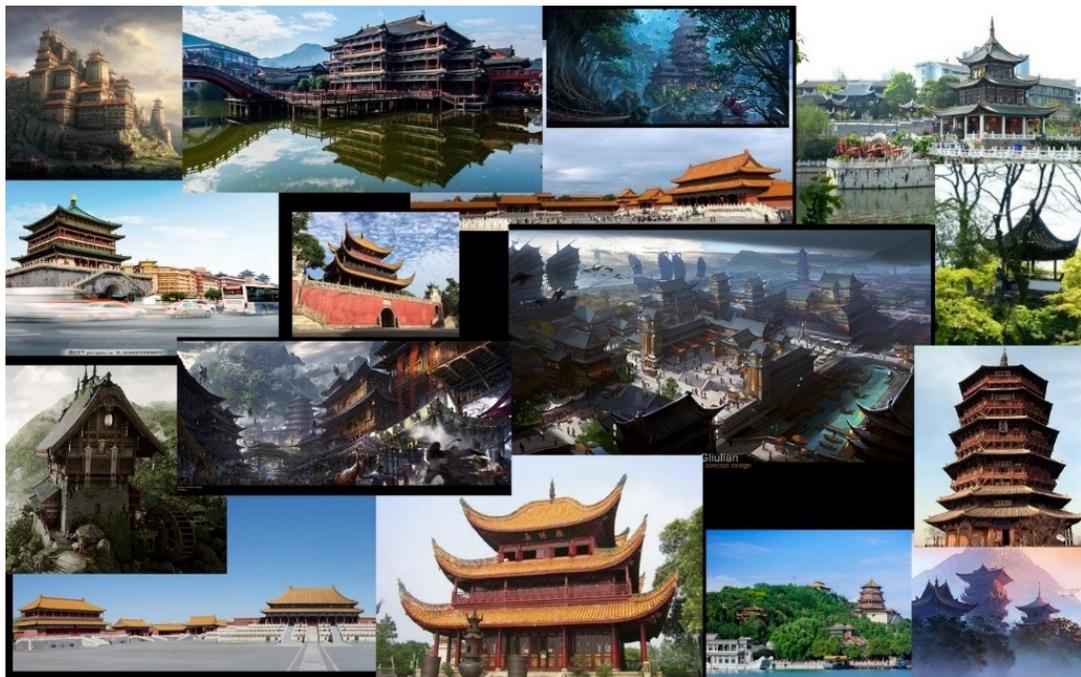


Figure 14 Image combined in Photoshop © Zhi Wan

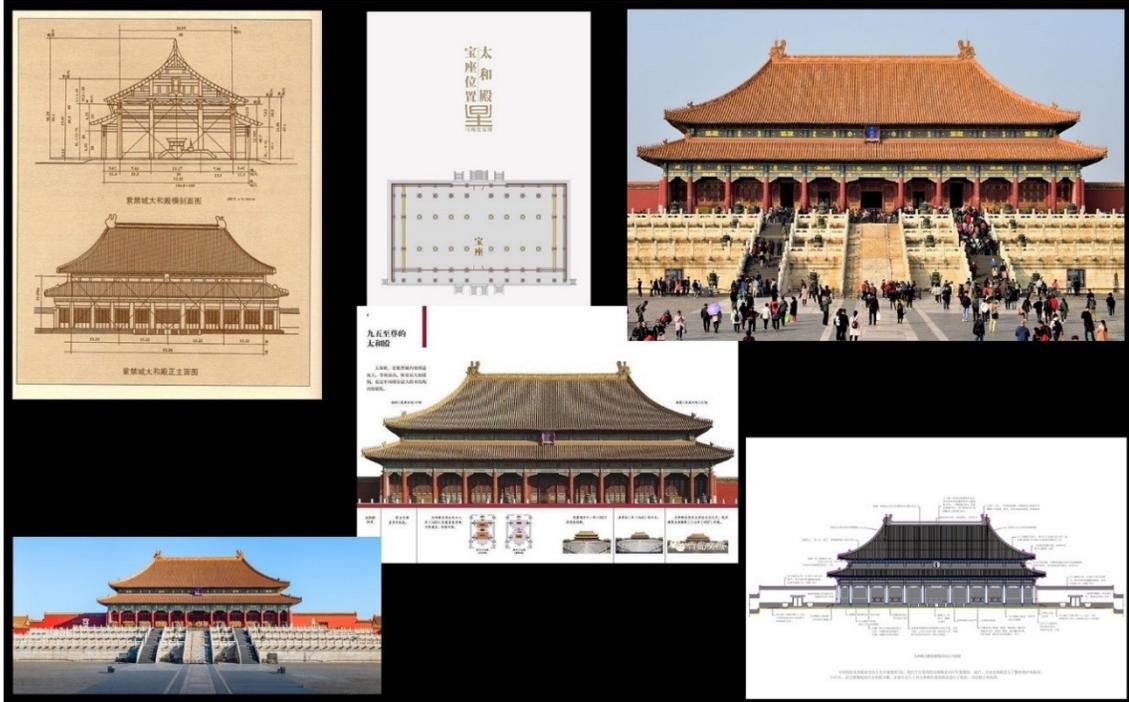


Figure 15 Image combined in Photoshop © Zhi Wan

4.2.2 The interpretive analysis of the first stage

This is my interpretive analysis. Collecting related visual references is essential work for me. I also take a lot of high-resolution pictures while I am traveling. It has become a habit for me to always have tons of references on my hard drive. This habit of auto-collecting image references shows the concept of “knowing in action” (Schön, 1983). Professionals know what to do or how to do it in certain circumstances, even if they are not in the working environment. So, in the first stage of this process, I automatically started searching for references, using what Schön (1983) calls my repertoire of precedents and ways of seeking familiarity.

This time, the material collection was however different than my previous experience. I paid attention to collecting some documents as well. I read some Chinese architecture articles. Since I was exposed to Chinese cultural elements as a child, I accurately know what

type of elements I am looking for. For example, I read articles by Liang Sicheng, a famous Chinese architect. Some of his papers about Chinese traditional architecture gave me much inspiration. I also found a book that explained “The Forbidden City” architecture in detail. The book includes a lot of pictures and text analysis. It was very helpful for me to build the correct 3D model in the Blender software for the next stage. The book is called “*Tai He Dian*” (Zhou, 2021) which is the most important building in the Forbidden City. The book was published in 2021 with all the latest research from Chinese historians and architects. It is worth noting that this book is only available in Chinese, and I can understand the content without any obstacles.

By using the reference mentioned above, I am trying my best to avoid any bias on Chinese architecture. The concept of Orientalism leads me to take the right action about collecting references.

4.2.3 The description of the second stage

The second stage of the project is the building of the model in the 3D software. I used the blueprint that I found as a basis to start building a rough model in the software. The main process can be seen in Figure 16 for details. The first step in modeling is to create the main hall of the building. Then I modeled columns and roofs. The roof is the central focus of the entire modeling. This part has an important impact on the subsequent digital matte painting. Therefore, I referred to many materials when modeling the roof, striving to be consistent with the real historical building. I will elaborate on these details in conjunction with the third stage.

Once the modeling part was finished, I started to finalize the architectural look. Based on the classical color of the architecture, I made red and yellow shades for the model, and I

set up the lighting. I brought the light to the top left corner, so we would be able to see the columns' shadow hitting the hall wall and make this building look nice. I brought the camera to the middle of the building and set an angle looking towards the roof. Please look at the center image of Figure 16. This brought me to the final 3D render result. I also rendered an ambient occlusion (AO) pass and a material ID pass (see Figure 19) in 3D software. The AO pass helps me present the 3D sense of the picture and a material ID pass helps me identify each element of the building in 2D software, which I will explain clearly in the third stage of the practice.

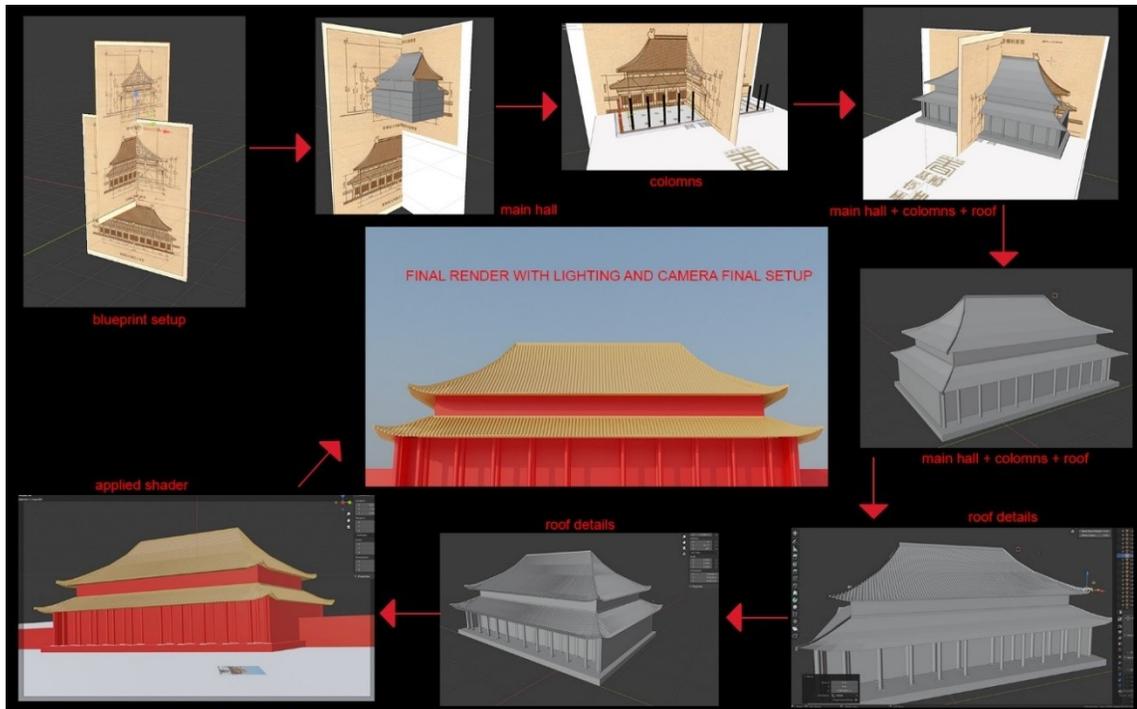


Figure 16 Image rendered and combined in Blender and Photoshop © Zhi Wan

4.2.4 The interpretive analysis of the second stage

With the description of the second stage, I would like to conclude with my interpretive analysis. Although I previously modeled a lot of objects, this was my first Chinese traditional

palace. I used my prior experience to build the object, but it was not working, as described in this paragraph from my logbook:

“This is what I have right now. (Figure 17) But it’s not working. I studied more about the building structure. I found out that this building was built by all the columns (see attachment), so I decided to restart everything. I found another model online and it inspired me a lot, here is the link¹⁰ : Just find out the website which is clear about the structure¹¹. So, I started building based on columns”

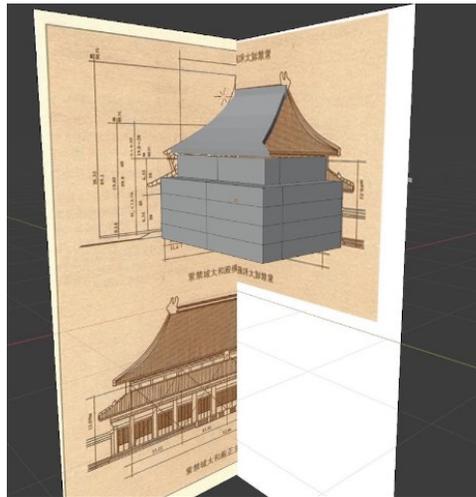


Figure 17 - Image captured from logbook © Zhi Wan

The above paragraph showed that I encountered a problem while doing the modeling. The initial method that I had chosen to build the model was not working. Since I couldn’t build a roof with my current structure, I had to investigate and find a solution. I went online to find out more about the building’s structure. Then I realized that I should start the object by building columns instead of cubes. This process of encountering problems and solving them is rooted in my appreciative system (Schön, 1983). I reflected on the surprising

¹⁰ <https://3dwarehouse.sketchup.com/model/49b4f8d7e9a0f0fe9222d55b09b61449/%E5%A4%AA%E5%92%8C%E6%AE%BF>

¹¹ https://www.thepaper.cn/newsDetail_forward_8974236

situation and took action on it until the problem was solved. This is what we call “reflection-in-action” based on Schön’s concept.

4.2.5 The description of the third stage

The third stage is the most important part of my process. This part is the digital matte painting practice. I use the final rendering output from the 3D software as the basis for the digital matte painting. I will complete the production in order from top to bottom. First, I need to make the top of the Chinese architecture - the roof. This is also a very important step in the entire DMP because the roof will involve many Chinese architectural symbols, signs, and structures. I started at the top and mapped it using the most historically accurate images I could find. We can see the preliminary rendering effect in Figure 18.



Figure 18 Image rendered in Blender and made in Photoshop © Zhi Wan

After creating the ridge part and four side roof hips. I started filling the field of the roof part. The tiles of the “Tai He Dian” are glazed tiles, mainly tube tiles and slab tiles. I searched a large number of rooftop textures to closely approximate the real one. For those details, I

will combine them with my theoretical concept to explain my working process. I used an ID pass to help me select the exact part that I needed to fill the specific roof texture. (see Figure 19 below). I mixed two different kinds of reference to fill the upper roof part. And for the middle roof part, I used another reference picture. (see Figure 20 below). After completing the material mapping of these parts, the roof of this traditional Chinese building is completed. Then I added the plaque “Tai He Dian” and decoration painting to the middle and completed the row of complex patterns behind it.

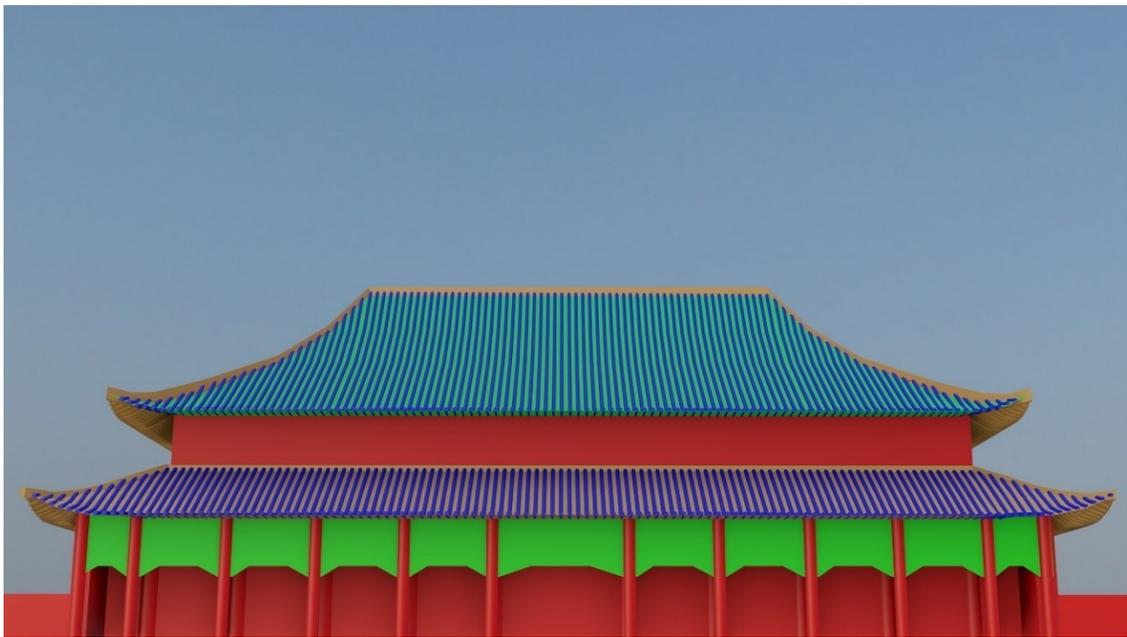


Figure 19 Image rendered in Blender © Zhi Wan

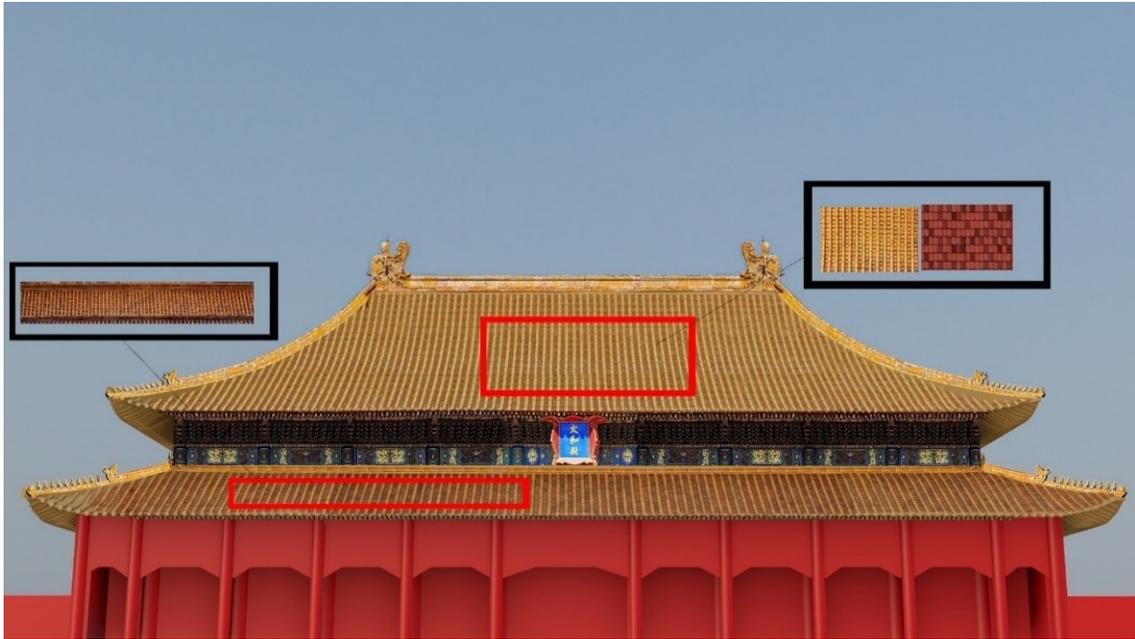


Figure 20 Image rendered in Blender and made in Photoshop © Zhi Wan

4.2.6 The interpretive analysis of the third stage

The third stage of DMP practice includes many important steps, but the two most important need to be better explained and analyzed interpretively. They are the creation of the symbols and signs on the roof and the rooftop texture creation process.

4.2.6.1 – The reflective process of roof symbols and signs creation

Before creating the roof part symbols and signs, I had already collected many reference images during stage one. Since I was focusing on the roof top part, I continued my search only for that. I tried to expand my repertoire about this part. During the process of collecting information, I noticed that there were symbols at each corner of the roof. Based on these observations, I reflected that my DMP would have to add those symbols. Therefore, I studied the symbols on the roof ridges. Other than the images that I collected, I read the book “*Tai He Dian*” (Zhou, 2021). I found the meaning of this symbol and what is the purpose,

etc. All the details are noted in my DMP practice field notes. (see Figure 21). Here is what I wrote in my notes:

“At the top of the building we can see a dragon head-shaped decoration called "Zheng Wen". This is the largest “Zheng Wen” in the Forbidden City. Its surface is decorated with dragon patterns, the dragon claws are in the air, and the beams are swallowed up with angry eyes. As a town hall for the entire building to ward off evil spirits, it symbolizes the majesty and supremacy of imperial power. (Zhou, 2021, p.118, informal translation by the researcher)”



Figure 21 Image captured from logbook © Zhi Wan

To make sense of the rooftop that I was constructing, I searched for the object that I wanted to add and discovered its three aspects: 1) visual representation; 2) the function of the object; 3) its culture as it seems to be the most important aspect of the three.

The visual representation of the rooftop is a dragon image. There is a sword handle on the back of the dragon. The function aspect of this object is to present the level of the architecture. About the cultural aspect, the main explanation is that the object symbolizes that the building avoids or resists fire. Most of the ancient buildings in China were made of wood, so it was easy to catch fire. The dragon, as a creature that can fly into the sky and into the ocean, can spray water to prevent the building from catching fire. About the sword handle, it is to fix the dragon and prevent it from flying away. The dragon representation also implies that royal dignity is sacred and cannot be violated lightly.

Investigating the object or symbol's meaning is something new to me in the DMP process. Categorizing the object by aspects did not come to my mind when I first investigated the object. However, my interest, respect, and taste that I have for the ancient architects led me to understand the structure better and better. Then the categorization became more and more clear, as I relied on my aesthetic judgments, personal values, and sensitivity for appreciating artifacts and results in my creative process. This process refers to my appreciative system (Schön, 1983). For example, as a personal value, I want to respect the authenticity of traditional Chinese architecture and go beyond Orientalism as much as possible.

Beside making sense of the artistic and cultural point of view, the need for judging if it's a good fit from a professional point of view is also part of my appreciative system, as it encompasses norms, values, and ways of judging artifacts as well. I indicated in my field note "Here are the reasons that I took this picture into my DMP, the resolution, lighting, and contrast of the image are good enough for my DMP". I was able to find a good picture for that part (see Figure 22) My reflection about image resolution, lighting, and contrast is a part of my repertoire and appreciative system. (Schön, 1983) The past ten years of DMP experience led me to pay attention to those details when I selected the image. Usually, I only download images with high resolution. Then I would make a comparison with my DMP base image. In this practice, my DMP base image is my 3D render result. Most of the time, I won't be able to find the perfect match, but I can always adjust in Photoshop, and it will come out with a good result. These professional actions become a routine for me every time I start a DMP. Here, we refer to Schön's "knowing-in-action" concept. When professionals have accumulated some experience, they will naturally form their work system or work

habits. The formation of my work habits is closely related to my education and the companies I worked for. When I was in school, I formed a basic work pattern, which was relatively simple. For example, I learned that I must pick pictures with high resolutions, and I gained a basic sense about the lighting and contrast. After I started working, based on my original work habits, I learned new things from my colleagues and solved new issues with the team in the company. My working habits have been continuously updated and improved. For example, I now know precisely what the proper resolution for my DMP is, not just seeking the highest resolution. Regarding lighting and contrast, I value it not just with my senses but also with some tools to verify my subjective assessment. Except for the “knowing-in-action” concept, this process also contains other Schön’s concepts, which I will describe in the following paragraphs.



Figure 22 Image captured from logbook © Zhi Wan

Although the DMP subjects change over time, the processes are similar. Schön (1983) explains this phenomenon as repertoire. Practitioners can recognize the similarities between individual cases.

I explained how I was choosing the right image for my DMP process culturally and professionally at the beginning of this section. I applied this to the four side roof hips (see Figure 23 and Figure 24). I also made a field note about that.

“In addition to the "Zheng Wen", there is a particularly important feature on the roof of the “Tai He Dian” which is that there are small animals of various shapes on the roof. They are called "Rui Shou" (auspicious beasts) , and they are neatly arranged behind the “Qi Feng Xian Ren” (the shape of a fairy riding a phoenix). In terms of function, the original function of the “Rui Shou” (auspicious beasts) decoration on the roof of the “Tai He Dian” was to protect the nails on the roof beam.

The roofs of the ancient buildings in the Forbidden City reflect the level of the building by the number of “Rui Shou” (auspicious beasts) . The more auspicious beasts, the higher the building level. The number of “Rui Shou” (auspicious beasts) on the roof of the “Tai He Dian” is the largest in the Forbidden City, and the number is even, there are ten in total, one is: dragon, phoenix, lion, “Tian Ma”, “Suan”, “Ai Yu”, “Xie Zhi”, bullfighting, “Xing Shi”, This is an isolated case in the Forbidden City.” (Zhou, 2021, p.120, informal translation by the researcher)



Figure 23 Image captured from logbook © Zhi Wan



Figure 24 Image captured from logbook © Zhi Wan

I applied those three aspects of the rooftop object to the four side roof hips parts in the DMP process (see Figure 18). I observed the pattern and design of the object. I tried to

understand that part of the building's function and I also drew out the cultural meaning behind those roof rig parts. I turned this investigating process into a new repertoire that I gained. Reading and understanding the symbols' meanings enhances my knowledge of Chinese architecture. By gaining more knowledge, I can make less stereotypical, more realistic images and avoid wrong presentations of the objects I create.

The description and interpretive analysis of my reflective process for roof symbols and signs creation leans more towards the artistic and cultural point of view. To understand more about the professional point of view, I will discuss the reflective process of roof surface texture creation in the next section.

4.2.6.2 – The reflective process of roof surface texture creation

Texture creation is a common procedure within the DMP process. Sometimes matte painters can re-use the same texture for a new DMP, but in my case, I created a new one to fit my DMP. Referring to my field note:

“What I am going to do is to improve the texture of the 3D model. I've been looking all over the references for “Tai He Dian”, but the building roof was too old and rusty. I Instead, I looked for other similar buildings having a clear surface. I will blend the roof tile texture with a 3D model. Different parts of the roof use different textures. Top part mixed with two different textures, to better present the tube tiles and slab tiles.”

Collecting images is always the first step in my process. This is the “knowing-in-action” concept. The action of collecting images is one of the signs that shows I know how to start my DMP process. While I am collecting, I reflect on the images as well. I judge if the image will be considered as a reference to inspire me or as a texture that I can add to my DMP process. This process was noted clearly in my field notes. (see Figure 25)

“Because the area and lighting of the roof are different, I chose to use two methods to complete the upper roof and the middle roof. For the upper roof, I chose: This type of

material can be extended infinitely and is not affected by the area, but a single material will make the roof look low-key in color. So, on this basis, I superimposed another material to increase the color effect. This superimposed effect will make the roof look rich in layers after magnification! As for the middle roof, because it is smaller in area, I can find relatively suitable photo materials.”

The two images at the left of Figure 25 were considered as a reference to show me the real look of the roof surface. The other two images in the figure are the textures that I selected to apply in my DMP process. The main reason for not using the reference image as texture is the picture was not qualified with the perspective of the DMP. It would be very difficult to match it, and it might lose the resolution. The texture images are extendable and easy to apply in the DMP. Using the reference picture as a guide, I can improve my DMP by adding details like dirt and rust in my DMP. This will increase the realism of the painting.

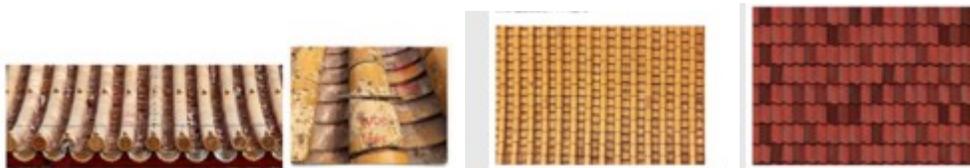


Figure 25 Image captured from logbook © Zhi Wan

The reaction to and analysis of materials usage in the previous paragraph cannot be acquired in a short time. Building my repertoire of precedents (Schön, 1983) required accumulated reflection, experience, and a lot of practice. Indeed, the process of creating the roof texture part used much of my repertoire of precedents. Referring to my explanation about the repertoire in 2.1.4, the first and third category of the repertoire was being used in my DMP process. The image reference and the skills that I collected during the DMP practice belonged to the first category. Since I am Chinese and have more access to knowledge about Chinese culture than non-Chinese people, I believe that I have a richer repertoire in which to seek familiar patterns and understanding of Chinese elements of architecture. This part belonged to the third category.

4.2.7 The description of the last stage

After completing the above steps, most of the work has already been done. There remains only the bottom part of the building. The bottom part is mainly composed of columns and the supporting parts between them and the doors and windows of the building. The middle part of the column is called “DouGong”. This part fully reflects the Chinese cultural characteristics of the building and the meaning and symbol it represents. This part requires finding accurate pictures for mapping to ensure that the building is accurately represented. Finally, there are the doors and windows of the building. In this type of traditional Chinese architecture, the doors and windows are generally connected, especially the main entrance. So, I handle the creation of doors and windows together.

Please see Figure 26 for the result.



Figure 26 - Image made in Photoshop © Zhi Wan

In the last step, I completed the mapping of the walls on both sides of the building and superimposed the AO pass rendered in 3D software to increase the shadow and lighting effects, which can make the entire DMP more realistic. I present the rendering of the AO pass and the result of DMP in Figures 27 and 28 below.

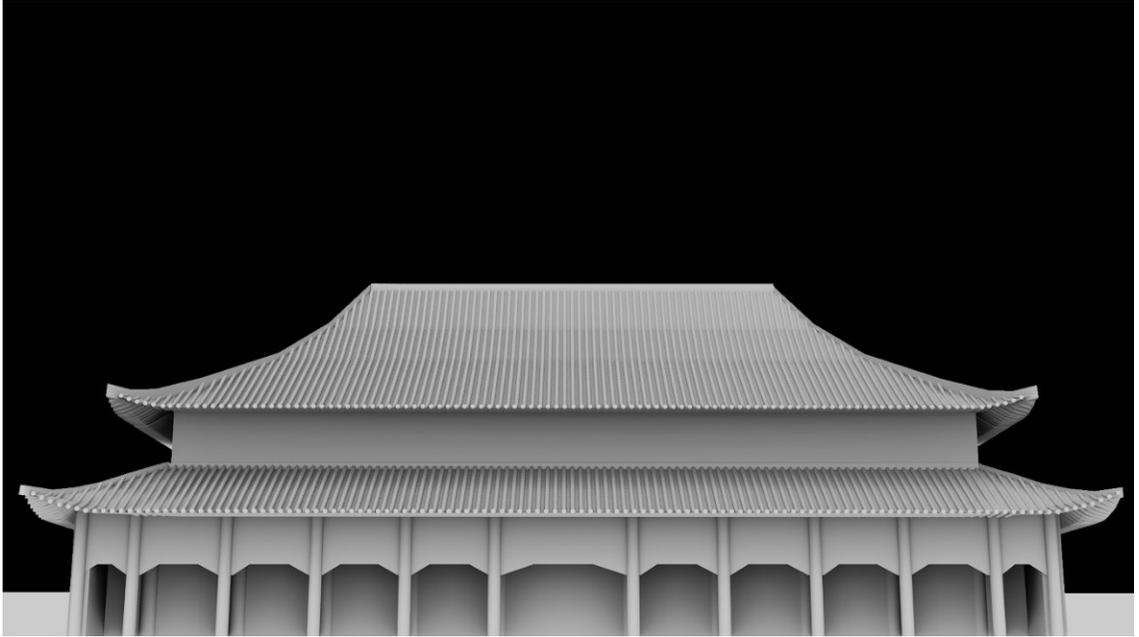


Figure 27 - Image rendered in Blender © Zhi Wan

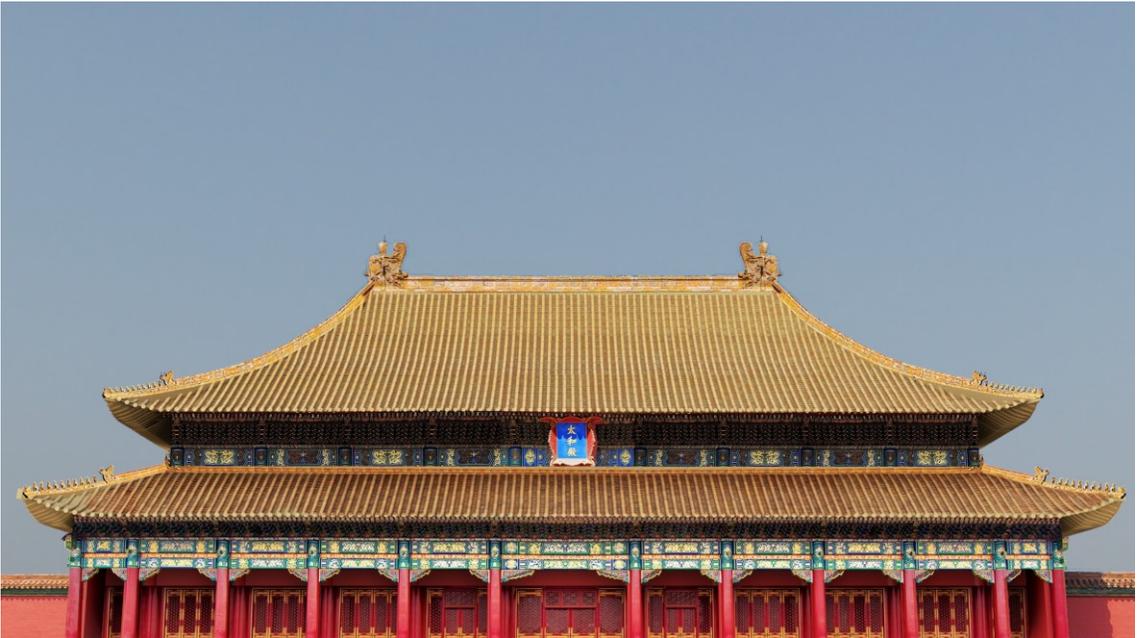


Figure 28 - Image rendered in Blender and made in Photoshop © Zhi Wan

Section 3 – Synthesis

This chapter presented the most relevant stages of reflection throughout my DMP creative process. In this chapter, I described and interpretively analyzed this process by referring to Schön's concepts and Said's. The review of the field notes helped recap the process and prompted additional reflections as I carried out the analysis. As I made successful discoveries in my DMP process, I highlighted my considerations of cultural aspects and personal values. The next chapter presents the final interpretation and discussion of my study.

CHAPTER 5

INTERPRETATION AND DISCUSSION

This chapter presents my final interpretations and discussion. First, I sum up the problematic situation, the objectives, and the research question. Second, I discuss the theoretical and methodological approaches used in the study. Third, I make final interpretations of my creative process. I conclude this chapter by reflecting on some issues encountered as a practitioner-researcher during the study.

Section 1 – Back to the problematic situation, research objectives and question

In Chapter 1, I framed a problematic situation based on 1) the lack of full understanding of digital matte painting practice, beyond technical expertise and oversimplified definitions from the major books. I raised the need to study DMP practice more thoroughly and in a complex manner, to better understand how professional digital matte painters think and use their technical skills, why they do what they do, and what their motivations are. I proposed to refer to Schön's epistemology of practice to study DMP practice beyond technical rationality and by considering the situated reflective process of the practitioner. The problematic situation is also 2) framed by my personal and professional experience; being a DMP practitioner for 10 years as well as being Chinese, I have felt doubt and discomfort about the lack of understanding of Chinese culture in Hollywood productions, especially about architecture elements misrepresented in digital matte paintings.

I pointed out that there are a lot of stereotypes and Orientalism in Oriental films produced by Hollywood, both in production and post-production, and I showcased two Hollywood movies, "*Indiana Jones and the Temple of Doom*"® (1984) and "*Mulan*"® (2020). I elaborated on Orientalism in Chinese architecture.

The main objective of this study was to explore digital matte painting through practice, applying a reflective process during a unique and complex situation. I think the findings helped to answer the research question: “What is my reflective process, in terms of repertoire and appreciative system, “What is my reflective process, in terms of repertoire and appreciative system, in my practice of digital matte painting creation of a Chinese exquisite imperial palace of the Qing Dynasty?” In the following, I will explain how and why.

With this study, I hope to stimulate discussions in the emergent academic field of digital matte painting. I also wish to offer an account of cultural and historical considerations in digital matte painting practice, specifically with respect to Chinese architecture in the present case.

Section 2 – Discussion on the conceptual and methodological approaches

With the help of a theoretical approach, I was able to explicitly explain the formerly implicit creative process. First, the concepts led me to reflect on my creation process and try to document my implicit knowledge as precisely as possible. Second, it allowed me to interpret my implicit or tacit knowledge and actions in a professional context, so they became explicit. Third, it brought academic rigor to my analysis and interpretation. In addition, fusing the concepts of reflexive practice with consideration of Orientalism brought to light the usefulness of and a methodology for correctly evaluating the cultural aspects in an image, which will hopefully spark new discussions about producing culturally appropriate visuals.

Qualitative methods such as journaling, autoethnography and interpretive analysis helped me to describe a complex process. It helped to explicate tacit knowledge, to reveal

what I have in mind, the way I think and act in practice, based on my professional experience and personal values and considerations.

Section 3 – Final Interpretation of the creative process

In the following paragraphs, I will link the analysis from chapter 4 and rearrange my result from the aspects of repertoire, appreciative system, orientalism and reflexive practice.

5.3.1 - Final interpretation from the aspect of repertoire in the creation process

In Chapter 4, I highlighted the importance of collecting references for a strong repertoire. I noticed the difference from my previous material collecting experience. This time, I was more focused on understanding the principles or logic of architecture. With this creative process experience, I was able to examine Schön's concept. So, I would like to state my own understanding of repertoire. I would split the repertoire into four categories. First category: artifacts that you have already done in the past as professional DMP --- artifactual or technical knowledge, physical or virtual artifacts; material or immaterial. Second category: situations or projects that you have already gone through in the past as a professional DMP --- experiential knowledge that involves the human dimension. Third category: artifacts, situations, or projects you know based on cultural/historical knowledge: e.g. Chinese philosophy, values, norms, ways of thinking and appreciating: mostly conventions and symbols from Chinese culture. Fourth category: Everything you have experienced and felt as a person so far in your life more broadly. It is the historical dimension of you as a person, beyond DMP practice.

To echo the types of repertoire we mentioned in the previous paragraph. If we bring the repertoire into digital matte painting practice, we could split into four categories as well. Digital photographs, videos, and some useful brushes are digital matte painters' physical objects that fall into the first category. The software skills and knowledge such as lighting theories would be invisible repertoire in the second category. Then practitioners' cultural background and educational background could be part of their repertoire in the third category. The experience of being involved in the post-production of an entire film must also be part of matte painters' repertoire within the fourth category.

In short, I accumulated knowledge about traditional Chinese architecture, especially the structure and principles of Qing Dynasty architecture. I also collect a lot of architectural decoration meaning from the aspect of Chinese culture, belief and philosophy. To maintain the concept framework of reflexive practice, I did not mention too much about the aesthetic aspects of architecture, but I explored some information, which can help me better understand the beauty of Chinese traditional architecture for future use.

5.3.2 - Final interpretation from the aspect of appreciative system in the creation process

Regarding the appreciative system, I would like to specify my creative process value. I aim to show the cultural values of traditional Chinese architecture. By creating the details of the architecture, I expose the structure and logic of traditional Chinese architecture. I aim to show the impact of Chinese culture, belief, philosophy and norms in architecture.

Then I specify the criteria of the creative process. I need to restore the building as much as possible, respect the structure of the building and try to avoid the aesthetics aspect

from the creative process. Because there are too many aspects involved and I cannot explain them in detail one by one, which may require another study to supplement. I just restore the cultural symbols presented in the building as much as possible.

In solving the problem of roof structure modeling using my appreciative system, I discovered a new step during my creative process, which is to understand the reference image's cultural significance. This action aims at avoiding "orientalist moves and results" while creating the digital matte painting. I interpret this new step as an enrichment of my experience with creating Chinese architecture.

Being nurtured in Chinese culture since childhood, most traditional Chinese elements are familiar to me, but I have never had the opportunity to learn about them in depth and in detail. In such an environment that I am familiar with, I can explore so many details. I will for sure discover more when I am in a different environment.

This exploration made me reflect that in my previous DMP work, I may have missed so many opportunities to discover more about the work that I had done. In daily life, we may think that some scenes are normal, but they may contain more details than we had in mind.

5.3.3 - Final interpretation from the aspect of orientalism in the creation process

Orientalism in Hollywood is not a short-term problem. I first pointed out some phenomena and problems in movies in the first chapter. Secondly, I have a deep understanding of the reasons behind it by explaining the concept of Orientalism. Finally, in the creative process, I tried to get rid of this Orientalism. As I mentioned about my value and

criteria of my creative process, I am trying my best to restore authentic Chinese traditional architecture. I try to create a building based on my scientific research by respecting books and historical documents. So, the methods I used are as follows: 1. Collecting original materials, such as architectural blueprints, etc. 2. Referring to historical books and references. 3. Using existing real photography.

Although I have relevant cultural background, I cannot create buildings based on my own ideas. For example, in 4.2.4, I encountered a problem. I thought that this was just a basic skill for building a model and ignored the structural problems of the building. I didn't pay attention to this matter. I must stick with the relevant reference, then I might be able to avoid this problem.

Compared with the repertoire and appreciative system, Orientalism permeates the entire process. The concept always affects every move in creation. This concept is more likely to appear implicit and difficult to become explicit. This is also a difficult point that the concept of Orientalism needs to be presented.

5.3.4 - Reflective practice as a whole

"Reflective practice" allows me to overview and reflect on my creative process. I connected it with my experience. Then, I summarize the meaning behind this creative process and the inspiration for future creations.

In the digital matte painting process, I explained the cultural symbolism of the building, which made the whole creative process more meaningful. I hope to incorporate cultural

awareness into the creation of visual effects. In addition, I hope that the beauty of Chinese architecture will be more widely recognized.

With respect to professional experience, describing my reflective process could inspire visual effects artists to recognize their own problem-solving steps and notice the importance of experience. This could help them (re)build their repertoire and recognize their appreciative system. Beyond technical expertise, I see this as the raising of an awareness that could help practitioners identify and solve issues in their own practice. I see this awareness as a tool to think and act more effectively.

With respect to Hollywood productions, I wish to raise awareness of Orientalism in Hollywood productions. Hollywood has a century-long production history. One single study cannot change the situation, but it can encourage Hollywood production teams and filmmakers to create structures that conform to Chinese culture and history.

Section 4 – Limitations, value and reflexivity

The first limitation of the study is the complex and mainly subjective posture of the practitioner-researcher. Indeed, the whole research approach aimed at considering my prior background, experience, and knowledge. Though this has been helpful, it remains highly subjective and subject to bias and limited by my understanding. For example, in the material selection mentioned in 4.2.6, I selected pictures that I think meet the requirements based on my judgment.

A second limitation is the impossibility of mentioning and documenting all my reflections. Having both hats, as a researcher and practitioner, I needed to constantly switch roles in the process of simultaneously creating and recording DMP. As a practitioner, I had to carry out a creative process, while as the researcher, I had to record the process as well. This was not a simple operation. During the creative process, a lot of reflections formed in my brain, without necessarily being recorded or written in the notes. In this respect, I raise the issue of whether practitioners can record all their reflections on their creations without missing a beat in their role as researchers.

5.4.2 Reflexivity of the practitioner-researcher

In line with the results of my interpretations, I would like to emphasize how this study helped me to improve my reflection regarding my professional practice as a digital matte painter practitioner. Thanks to this study, I was able to deeply reflect on my values, my vision for my professional practice, and my academic and professional growth. When I established my research topic, I had to immediately consider what I valued in my profession. These values undoubtedly influenced the direction of my study and led me to create an ideal picture of my practice. Beyond all these professional values, I also integrated my cultural background into my studies. This element enriches my study and takes my research a step further.

As a practitioner, I have learned that I need to put my knowledge and skills together with theory into written form. This can make my implicit professional values explicit. As a researcher, I learned how to use theory to guide practitioners to express their hidden abilities. This pushed me to reflect on academic training and the lack of theoretical discussions in the digital matte painting and visual effects field. It made me think that the use of theory is

important and that this needs to be trained and polished, just like the technical skills required to use and learn new software and methods in my daily practice.

Finally, conducting this study led me to reflect on my professional practice and training. It also influenced my DMP professional working routine. Cultural considerations will be added to my DMP routine. It will not be a specific step to be paid attention to but a general evaluation throughout the entire process.

CONCLUSION

Before drawing conclusions from my study, I wish to reiterate the purpose of the study. First, I wished to offer an embodied and situated account of the digital matte painting reflective process that would hopefully spark discussions in the emergent academic field of digital matte painting. Second, I wished to demonstrate a complex reflective practice and offer an account of cultural and historical considerations about the digital matte painting process. I believe that this research project has achieved a convincing success, but many future studies are still needed to continue to enrich this unique field of specialization that has been lacking in academic discourse for a long time.

At the end of the study, I provide a complete summary of our findings. The research uses a researcher-practitioner approach incorporating concepts of reflective practice and ideas about Orientalism to produce a digital matte painting creation. Through this exercise, I have reflected through practice and used Schön's concepts of "appreciative system" and "repertoire" to specifically study the purpose and effect of my use of relevant texture images. Second, I combined these concepts with Said's conception of Orientalism to deepen my analysis of an accurate use of traditional Chinese architectural symbols in my digital matte painting practice.

Based on this study, I can now summarize some thoughts on the digital matte painting profession and related industries as follows. First, I need to emphasize that digital matte painting is not just a technical craft, and just being able to technically complete a digital matte painting does not make an artist a good artist. A true digital matte painting artist needs to improve his or her understanding of cultural background, ideological theory, morality, and ethics in addition to understanding the technology. In this way, digital matte painters will

better enrich their repertoire and master DMP more solidly. Second, there is a need to reflect on the training/education programs for related post-production skills, including the digital matte painting profession. Today's training is too simple, just requiring students to master technology and pursue effective and fast results. However, training institutions often ignore the development of students' aesthetics, culture, ethics, and morals. What is a beautiful picture? What is the cultural root of the picture? Is there any historical basis? Does it meet the basic ethical and moral standards? These seemingly unimportant questions are the cornerstones of making related creations. Movies are a part of mass media. A good movie can affect a person's life, and, ideally, no part of the movie should mislead the public. This may also be an important way to influence people's ideology.

Future Research

Finally, I offer some suggestions for the direction and development of future research on matte painting. This study mainly focuses on the analysis of the understanding of reference images for certain themes of digital matte painting, which is an important part of digital matte painting creation, but not the only part. Due to the limitations of the length of the graduate thesis and the application of the theoretical framework, we have not presented the whole production of digital matte painting creation from the beginning to the end. This type of research may need to be presented in several different research reports using additional theories and methodologies.

In addition, this research paper mainly discusses Orientalism existing in Western films, but many other similar prejudices exist. The East also has inherent ideas about the West,

and the cultural customs in different regions of the world are different. The exploration of research in this related field is far from over.

Finally, we must expand outwards appropriately. Digital matte painting is only one of many disciplines in visual effects and is closely related to other preceding and following tasks. Digital matte painting alone cannot complete a wonderful film or television series. As a long-term front-line post-production staff member, I hope to see more academic articles published on related disciplines. Let the visual effects industry not only be showcased at film events such as the Oscars but also find a place in many academic seminars.

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APPENDIX 1 – Literature Review About Matte Painting

Relevant articles or books and used in the paper	Reason
<ol style="list-style-type: none"> 1. Mattingly, D. B. (2011). <i>The digital matte painting handbook</i>. Wiley. 2. Okun, J., & Zwerman, S. (Eds.). (2020). <i>The VES handbook of visual effects: Industry standard VFX practices and procedures</i>. Routledge. 3. Barron, C. (1998). Matte painting in the Digital age. <i>ACM SIGGRAPH 98 Conference Abstracts and Applications</i>, 318. 4. Vaz, M. C., & Barron, C. (2002). <i>The invisible art: The legends of movie matte painting</i>. 	
Relevant articles or books, not used in the paper	Reason
<ol style="list-style-type: none"> 1. Elhag, A., Romeh, R., Elhawary, D., Maghraby, T., & Hassabo, A. (2024). The art of matte painting. <i>Journal of Textiles, Coloration and Polymer Science</i>, 21(2), 365–372. 2. Petchararyutpan, K. (2016). <i>Matte painting "Utosphere"</i> (Bachelor's report, Albert Laurence School of Communication Arts, Assumption University). 3. Eisenmann, J., & Parent, R. (2010, February). Matte painting in stereoscopic synthetic imagery. In <i>Stereoscopic Displays and Applications XXI</i> (Vol. 7524, pp. 118-128). SPIE. 4. De Caria, M., Bhasuran, P., Müller-Jend, M., & Macha, M. (2023, August). Matte painting a brighter future: A USD-based toolset in Nuke. In <i>Proceedings of the Digital Production Symposium</i> (pp. 1-5). 5. Redford, A., & Anderson, E. F. (2022). Digital matte painting—An effective undergraduate assignment. In <i>Eurographics 2022, 25 April–29 April 2022, Reims, France</i> (pp. 17–20). 6. Shelton, M. (2021). <i>Production pipelines for creating a cinematic digital matte painting</i> (Honors thesis, East Tennessee State University). 7. Raturi, V., & Yadav, R. K. (2024). Synergizing artistry and technology by unveiling the integration of matte painting techniques in crafting precise and immersive visual effects backgrounds. In <i>International Conference on Machine Learning, Advances in Computing, Renewable Energy and Communication</i> (pp. 183–196). Springer, Singapore. 	<ol style="list-style-type: none"> 1. Less info compared to the two books that I chose 2. Used DMP as a tool 3. Used DMP as a tool 4. Workshop 5. Workshop 6. Workshop 7. Overlapping with Barron's book 8. Overlapping with Barron's book 9. New tech on DMP

<p>8. Hamus-Vallée, R. (2015). Matte painting or the quest for the perfect illusion: Analysis of the illusion processes of a hundred-year-old cinematographic trick. <i>Hybrid. Revue des arts et médiations humaines</i>, (2).</p> <p>9. Gu, C., Sun, J., Chen, T., Miao, W., Yang, Y., Lin, S., & Chen, J. (2022). Examining the influence of using first-person view drones as auxiliary devices in matte painting courses on college students' continuous learning intention. <i>Journal of Intelligence</i>, 10(3), 40.</p>	
<p style="text-align: center;">Non-relevant articles or books</p>	<p style="text-align: center;">Reason</p>
<p>1. Ebert, B., Singer, B., & Grimaldi, N. (2012). Aquazol as a consolidant for matte paint on Vietnamese paintings. <i>Journal of the Institute of Conservation</i>, 35(1), 62-76.</p> <p>2. Hansen, E. F., Lowinger, R., & Sadoff, E. (1993). Consolidation of porous paint in a vapor-saturated atmosphere: A technique for minimizing changes in the appearance of powdering, matte paint. <i>Journal of the American Institute for Conservation</i>, 32(1), 1-14.</p> <p>3. García Fernández-Villa, S. (2015). Filling as retouching: The use of coloured fillers in the retouching of contemporary matte paintings. <i>Rech3- International Meeting on Retouching of Cultural Heritage</i>, 199–208.</p> <p>4. Beccaria, C., Colombo, A., Gherardi, F., Mombrini, V., & Toniolo, L. (2016). Use of nanocoatings for the restoration of matte paintings. <i>Studies in Conservation</i>, 61(sup2), 265–266.</p> <p>5. Annum, G. Y. (2014). Digital painting evolution: A multimedia technological platform for expressivity in fine art painting. <i>Journal of Fine and Studio Art</i>, 4(1), 1-8.</p> <p>6. Blatner, A. M., Ferwerda, J. A., Darling, B. A., & Bailey, R. J. (2011, January). TangiPaint: A tangible digital painting system. In <i>Color and Imaging Conference</i> (Vol. 19, pp. 102-107). Society of Imaging Science and Technology.</p> <p>7. Jackson, W. (2016). <i>Digital painting techniques: Using Corel Painter 2016</i>. Apress.</p> <p>8. Yong, Q., Xu, D., Liu, Q., Xiao, Y., & Wei, D. (2022). Advances in polymer-based matte coatings: A review. <i>Polymers for Advanced Technologies</i>, 33(1), 5–19.</p> <p>9. Osadcha, K. P., Osadchyi, V. V., Kruglyk, V. S., & Spirin, O. M. (2021, December). Digital drawing and painting in the training of bachelors of professional education: Experience of blended learning. In <i>Digital Humanities Workshop</i> (pp. 141-147).</p>	<p>1. Traditional painting</p> <p>2. Traditional painting</p> <p>3. Traditional painting</p> <p>4. Traditional painting</p> <p>5. Digital painting</p> <p>6. Digital painting</p> <p>7. Digital painting</p> <p>8. Traditional painting</p> <p>9. Digital painting</p>