ILLUMINATES: ABSTRACT ANIMATION THROUGH PROJECTION MAPPING

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ABSTRACT

Illuminates is a video mapping installation that explores the aesthetic of abstract animation. The animation projects and maps onto 24 pieces of white pyramids placed on the wall in a pentagonal arrangement. This project exemplifies my attempt to use technology as a tool for my artistic exploration, to express my thoughts through perceivable qualities of colours, lights, lines, shapes and motion. The animation use non-lyrical music as the storyboard flows.

The inspiration for my project emerged from Khalil Gibran's quote “Trees are poems the earth writes upon the sky. We fell them down and turn them into paper, that we may record our emptiness.” The project seeks to address two elements: a harmonious feeling with nature and a sense of destruction of human eagerness in making the earth more vibrant and intense with their superficial needs.

Illuminates is driven by my fascination with geometric forms and the partnership of audio and visual phenomena, all of which have often triggered the presence of beauty in my inner and the outer world. I believe the use of projection mapping technique extends its presence through physical space.

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CHAPTER ONE

INTRODUCTION

1.1 Background Study

Today, the advent of digital technologies has provided the animators/ artists to create and mold the parameters of image and sound in imagined and imagined ways (McDonnell, 2007). The ever-evolving of modern art and the rapid evolution of technology in softwares/ and hardwares has enabled animators, artists and audio-visual enthusiast expanding their arts to new dimensions and perspectives to creative medium such as projection mapping.

The thesis project is an attempt to produce a body of work that will potentially form the basis of an installation or exhibition by fusing technology and arts. The motivation in creating this project is inspired by music, the complexity of nature, a fascination towards geometric forms, the endless digital possibilities and subtlety of fine art.

1.2 Objective

The aim of the thesis project is to explore the media aesthetic elements to create an abstract animation through the art of projection mapping. It attempts to investigate how these two subjects can be interlinked in creating self - expressive art form. The project hopes to explore the expressive potentials of media art form that is highly technical.

1.3 Significant of Research

This research is to identify the media aesthetic elements in creating a successful abstract animation and the art of projection mapping. By undertaking the thesis project, the researcher

sought to produce an expressive art form by fusing both aesthetic and technological potential through abstract animation and projection mapping.

1.4 Methodology

I began researching on selected works from visual artists who focus on projection mapping and case studies on selected abstract animations for better understanding of its' aesthetic. Reading on themes related to media aesthetic elements, the art of projection mapping and its' techniques will also inform the work. My research is largely based on animation shorts from the selected artists which I obtained online. The development of the process of animation to projection stage is documented in still photographs.

1.5 Thesis outline

The first chapter highlights the introduction of the whole thesis. Chapter two discuss on the overview of abstract animation, media aesthetic elements and the art projection mapping. It highlights on the use of digital technologies as an art medium. This is followed by case studies on visual artists' work that focuses in projection mapping and abstract animation. The question on how do we explore the expressive aspects in creating an expressive art form that is highly technical is answered based on other researches to thesis issue. Chapter three emphasize on the attempt to translate my thoughts into the language of abstract animation in creating the expressive art form. It highlights on its conceptual framework and the technical workflow of the thesis project to achieve its goal. Chapter five discuss and conclude the whole thesis project.

CHAPTER TWO

RESEARCH BACKGROUND

(Review of Literatures and Relevant Artists/ Artworks)

2.1 Animation

Animation is known as continuous movement of objects created by a series of still images. It is a process of setting inanimate objects in motion. It is a display of different images in a series in the form of 2D or 3D, arranged to create the illusion of movement.

One of the most apt definitions of animation has come from Norman Mclaren, the influential founder of the animation department at the National Film Board of Canada. He stated:

> Animation is not the art that move but the art of movements that are drawn; what happens between each frame is much more important than what exists in each frame; Animation is therefore the art of manipulating the invisible interstices that lie between the frames.
>
> (Furniss,1998).

Animation is a vehicle that has come to describe the possibilities available to moving cultures of images in any style, context or technique and perhaps most importantly in a range of disciplines. It has become a rich and increasingly popular mode of communication. It is due to the convenient way to express moving visual images. It can represent dynamic concepts, and it can make information/ message more attractive and engaging (Davis and Landay, 2005).

Animation is commonly associated with the making of cartoons, both 2-Dimensional and 3-Dimensional. The first animation films date back as early as 1910 (Taylor-Turner, 2009).

Since then, numerous animation films have been released expanding into more complex films. Notable animation films include Disney's *Beauty and the Beast*, *Aladdin*, and *Lion King* (fully animated films), *Who Framed Roger Rabbit* and *Space Jam* (live action/animation), and *Toy Story* (first full length 3D animated film).

Today, animation is used for everything ranging from a flip-book to even a motion picture. The digital revolution has brought major changes in animation practices that require a breadth of different skills. Technology has enabled the animators to establish new forms of visualisation and imaginary entities become reality due to the evolutions of motion picture.

2.1 Experimental Animation

Experimental animation has largely been cast as non-linear, non-objective abstract work, engaging with formalist, issues concerning colour, shape and line for its own sake. With the digital shift, different perspectives on the experimental have emerged as a result of artists, animators, film-makers and creative practitioners often using the same tools to create work for different contexts and purposes. All modes of expression - from classical narrative to anti-narrative - have been re-explored, freshened and re-subjected to experimental approaches (Wells and Hardstaff 2008: p9). This has lead to the growth of independent and adventurous animators and artist who are interested in personal expression and who regard animation as an ever-evolving art form. This enables them to extend and reflect their own unique artistic visions, skills and techniques.

2.2 Abstract Animation

According to Terri Dentry, an animation producer from Australia, in his article on abstract animation; Animation is a visual technique that creates the illusion of motion. Abstract animation is the conceptualization of pulling the inner meaning out which often refer as "moving art" (Dentri, 2009).

Abstract animation is a sub genre of experimental animation as many of these animations are experimental perhaps in theory unusual technique. Abstract animation is often referred as non-narrative visual/ sound experiences with no story and no acting. They rely on the unique qualities of motion, rhythm, light and composition in creating emotional experiences. The language of abstract animation is not a narrative construction but a composition similar to a music score. The pertinent factor is the intent of the artist and the resultant content. However, for the viewer who has little to no encounter with abstract animation, these moving images can be initially disconcerting and hard to understand. It is often meant for the viewer to feel and experience its' content rather than to understand its' meaning. Think about music. It can be considered the most abstract of the arts. Having its own structure, melody and rhythm, these sounds are not representational but rather there are composed to create an aural experience (Taylor-Turner, 2009).

Pamela Taylor Turner explains the language of abstract animation in unique way:

> The language of abstract animation, for the practitioner or enthusiast, is like discussing why one eats chocolate or why we stand at the edge of the ocean, experiencing the sensation of the sand being sucked out from under our feet by the pull of the receding wave. Or why we listening to a beautiful melody can create such stirring response. These experiences stand for themselves and need no explanation.
>
> (Taylor-Turner, 2009).

The use of abstract animation enables the expression of content and meaning that is not possible within the narrative and representational animation. It is an exploration of the inner world that is either from imaginations or experiences. The meaning/ message of abstract animation are often indirect, but need to be experienced. The magical about abstract animation is they let the audience experience all kinds of emotions driven from the visual and sound of the moving abstract imagery.

Abstract animation is often associated with the presence of music which the music itself is an abstracted form of expression. Abstract animation refers to show abstract forms with music to allow and influence the audience to interpret with their own storyline, message and meaning. The earlier exploration of this moving abstract imagery with the presence of music has formed the basis for what abstract animation is today (Moritz, 1991).

Animation shares many formal qualities of modern abstract painting. As renounced by Walther Ruttmann (1887-1941), a German film director his abstract painting of still images in favour of animating abstract imagery that could develop in space as well as time, which he saw it as the art form of the future (Moritz,1991). The only difference is time; motion and sound extend the possibilities of abstract expression. The colour is also different as the images made with projected light, or the electronic light of a video monitor, and not the pigments of paint.

2.3 Abstract Animation as an Expressive Art Form

According to Oxford Advanced Learner's Dictionary, 1999, expressive means showing or able to show one's feelings or thoughts. Expressive art form is a way of expressing one's emotions or thoughts into something visible as such language, acting, visual or music that is

characteristic of a particular person or a group of people. Being expressive is close related to human's emotion. According to Oxford Dictionary online, emotion means instinctive feeling as distinguished from reasoning or knowledge. As noted in the AnxietyZone.com, emotion is the language of a person's internal state of being, normally based in or tied to their internal sensory feeling. Love, hate, courage, fear, and sadness can all be described in both psychological and physiological terms.

Abstract animation can be referred as a form destined to be defined ultimately not by formal conditions; a frame-by-frame manipulation of materials in the creation of representational motion but by the animator's or artist's context and condition of expression (Wells and Hardstaff, 2008). As close as one can interpret that facial and body expressions and movements reflected the inner feelings and emotions, and so the motions in animation. Different kind of motion can interpret different meaning. Therefore, abstract animation is as subjective as any other art forms. Art itself is subjective and yet it requires some amount of extremely loosely defined objectivity as all art is not necessarily good or tasteful for any times. But then something as subtle as art cannot be defined, even loosely as noted by Kireet Khurana, a conceptualiser and director in his article 'The Changing Aesthetic in Animation'.

> Abstract or pre-representative paintings and drawings can be, and often are, more expressive of inner feeling than are representative products because the very process of representation involves a conscious awareness of outside stimuli rather than a direct expression of self…artistic abstraction...some of their essential aspects can be explained only if one remembers that art is not the hobby of making reproductions, a game quite independent of other aims and needs, but is rather the expression at an attitude toward life and an indispensable tool in dealing the tasks of life.
>
> (Arnheim 1966: p340)

By analysing these information, we can referred the animators and artist make fully utilise of abstract animation as an interrogative tool of continuity in translating or to adapt ideas/thoughts to the visual practice chosen as the mediator of creative expression. Animation knowingly considered to operate as a particularly effective tool in the translation and adaptation of other art forms and idioms. It extracts the essential meanings and effects of other disciplines and advances them through motion-driven visualisation. Abstract animation helps to self-consciously reveal the movement in static forms; the purpose and function of movements in motion forms; and the emotive and philosophical underpinning in text-based arts (Wells and Hardstaff 2008: p154).

> The ability to deconstruct a movement and reassemble it in a new or convincing way is the animator's territory. Many artists have realised their visions using animation as a means to externalise their inner thoughts and unique points of view. Animation gives the viewer the opportunity to gaze at a frozen moment of thought and to experience another person's rhythms.
>
> Christine Panushka, 1997

In an era of 'expanded cinema' or the 'manipulated moving image', animating remains a traditional art in a progressive context. Animators/ artists re-engage with history in attempt to liberate themselves from the styles and contexts that inform dominant practice. In the process, they have to re-think and re-imagine their art through its formalist roots and language. Animators/ artist exploring new ways and revisiting the constituent tools of expression in moving image forms to express their vision (Wells and Hardstaff 2008: p114).

Animation represents a particular opportunity to both records the act of creative practice and to represent the act of creative practice. The execution of animation in any technique essentially mediates the technical memory embedded in the creative consciousness and the body itself. The content of the work may also act as a direct expression of memory, by

operating as a representation of fantasy, feeling, recollection, preoccupation. Animation can capture inner states of consciousness and the physical ways in which they are expressed.

Meaning and expression of a pictorial object become manifest only to the the extent that the representation consists of forms which are well defined with regard to their shape, proportion, direction and colour. This is particularly relevant in view of the traditional theory, which derived expression from what the observer knows, by past experience, about the psychological or physical state of the objects represented (Arnheim 1966: p37).

2.4 The Aesthetic of Abstract Animation

According to Oxford Advanced Learner's Dictionary, 1999, aesthetic means being concerned with the beauty and the appreciation of beauty: appreciating beauty and beautiful things; it also means a set of principles influence artistic style or taste; the branch of philosophy dealing with the principles of beauty and artistic taste (Oxford Dictionary, 1999).

David Oreilley, an Irish film maker stress on the importance of aesthetics in animation production in his essay 'Basic Animation Aesthetic';

> The importance of animation aesthetics is such a subtle yet vitally important one. It might seem superficial to discuss these things, especially because cinema is so much more to do with content and story than a pure aesthetic experience, but nonetheless the visual nature of animation calls for debate on the subject. There is a continuous raft of animation, both commercial and independent, which looks the same, and I don't believe it has to be so. The more we think about the subject the more playful and interesting computer animation becomes, the medium feels to me like a recently opened Pandora's Box which is still being examined, understood and tamed.
>
> (Oreilly, 2012).

`Aesthetics' is defined as refined, tasteful, and artistic. But what is tasteful, refined and artistic? Is it not a set of our own personal opinions, prejudices, biases, cultures and environment which dictate, define and with passage of time, redefine this enigmatic word? What is tasteful today was not yesterday and may not be tomorrow (Wells and Hardstaff, 2008).

In the context of media history, it could be suggested that abstract animation language is an aesthetic system that is evolving into new media genres. Abstract animation refers to an aesthetic tenet of animation which sees animation as consisting of lines, shapes and colours, abstract forms to be manipulated by the animator at will. The organised pattern of shapes and colours, which in any work of art is the main carrier of the meaning and expression conveyed to the viewer. (Arnheim, 1966). Despite the ever-increasing technology and techniques in producing animation, animators is still in charge of making aesthetics decisions, but it can't solely rely on instinct when framing a shot but must acquire the knowledge and the skill to apply a regular basis of aesthetics elements that translate significant ideas into maximally effective messages (Zettl, 2005). Aesthetics in animation, as in any other art form, kept on changing with the times. By understanding the elements of media aesthetic, the animators will have little trouble deciding whether the effects were intentionally or out of ignorance. The aesthetic elements were used to direct people's perception into whatever meaning or message the animators want to convey. The animators also have to continuously observe the interesting recurrent and concurrent patterns. However, it is impossible to define aesthetics in abstract animation as it difficult to define in any other art form. Invariably, the animator's personal beliefs, personality and biases creep into his animation. Abstract animations, to a large extent, are a personal statement made by the maker.

2.4.1 Elements of Media Aesthetics

Based on the book of *Sight Sound Motion: Applied Media Aesthetics* written by Herbert Zettl; they are many elements in media aesthetics. I chose to focus on five elements that will form my attempt to create an expressive abstract animation. The elements are color, lights, sound, motion and timing.

Colour

Colour adds a new dimension to every art form. It brings information to the meaning of the the art itself. The coloured light at a rock concert incites intense and high energy to the music even higher. Colour energy refers to the relative aesthetic impact a colour has on us, which depends on the hue, saturation, brightness, the volume of the colour area and contrast between foreground and background. Of these variables, saturation is the most influential in determining colour energy.

The basic aesthetics perception factors are three major attributes of the colour as well as compatible colours. They are hue, saturation and brightness. Hue describes the colours itself, for example whether an object is red, blue, yellow and green. Saturation describes the colour and richness and strength. Brightness indicates the reflected amount of light, or how light or dark a colour would appear in a black-and-white photograph. Brightness is measured by the grayscale.

> Colour is one of our most potent generators of emotion, evoking powerful reaction by bypassing the *'intelligent brain'* and heading straight to the *'primitive brain'* where those strong emotional reactions originate.
>
> (C. Budny, 2003)

Analyse these information, it is clear that colours can influence our feelings. We perceive some colours and warm, others as cold. Different colours portray different meaning and emotion to human's feeling. It can have a deep effect on how we feel both mentally and physically (Nicholson, 2002). According to Bellatoni, an expert in the effects of color on behavior, colours can be an incredibly powerful tool for filmakers/artists, it can influence how audeiences feel, act and evoking powerful reaction and can be used to enhance visuals mood (Bellatoni, 2005).

Light

Light is essential to life and necessary for most things to grow. It is the key element of visual perception, and it orients us in space and time. It also affects our emotions. Lights are the agent that makes things visible. Lighting is deliberate control of light and shadows. The basic purpose of lighting is to manipulate and articulate our perception of the environment. It can also establish an aesthetic context for our experiences, a frame work that directs our feeling about a certain event. Lighting helps us, or makes us see and feel in a specific way. Through lighting we can articulate our outer space/time environment and our inner environment and it has powerful effects to our emotions. Both functions depend to a great extent on the proper control of shadows.

> In animation, without any shadows, we perceive only the basic contour of an object. But the true spatial nature of the object and its location relative to its environment remain ambiguous. As soon as we attached a shadow with bright light source, we perceive the object in a three-dimensional form. Our task is to make thing appear believable and real to audience.
>
> (Wells and Hardstaff 2008: p. 22)

The aesthetic principles of lighting to show what an object looks like, what texture it has, and where it is located in space and time. It plays a vital role in defining the look of a scene. Specific inner orientation functions of lighting are; establishing mood and atmosphere. In animation, film or any any other art form, lighting is treated as dramatic agents. The light is used directly as an aesthetic intensifier. The areas that need special attention when dealing with light are the nature of light, lighting purposes and functions, the nature of shadows, and the outer and inner orientation functions of lighting. Through the presence of light we get an impression of depth, movement, and shading in animation. Thus, effect the viewer's emotion.

Sound

Sound in various manifestations (dialogue, music, sound effects and the like) is an integral part of video and film. It is a pivotal media aesthetic element which can affect the final significance of abstract animations. It represents the all-important fifth dimension in the total field of applied media aesthetics. Sound is as influential as visual to the abstract animations content and message. Essentially, it is indispensable to any animation or film communication.

Music and other nonliteral sounds, such as electronic hisses can provide or increase the aesthetic energy of a scene. Cartoons for example rely heavily on music and sound effects as an energy source. Our emotion or internal energy is just easily expressed or supplemented by music. Literal sound is referential. It conveys specific meaning and refers to the sound-originating source. Literal or diegetic, sounds can be source-connected (we see on-screen what is making the sound) or source-disconnected (we see something else on-screen while hearing the sound.) it is used to supplement the scene.

> One of the most important structural functions of sound in abstract animation is to supplement the rhythm of the shot sequence or supplement the rhythm of the entire visual vector structure. The rhythm of the sound track can run parallel as a counterpoint to the animation rhythm.

According to Zettl, music can be literal or nonliteral, depending on the visual context. It is one of the most efficient aesthetic elements to create a specific mood or describe an internal condition. Music and nonliteral sounds are often used to provide additional energy for a scene. Music was part of the essence of life and attempted to balance science with aesthetics by elevating the status of the computer as a viable artistic medium to achieve correlation between musical composition and abstract animation. The non-representational nature of music is mirrored and enhanced the visuals that also expresses and appeal to human emotions (McDonnell, 2007). The immediate way in which sound affects our emotion is a perfect tool for establishing or supplementing the energy of the abstract animation.

Motion

According to Jon Krasner, the author of '*Motion Graphic Design: Applied History and Aesthetics'* motion is a universal language. The method chosed to move an element across the screen can enhance its meaning. For example a line of text that animate slowly across the frame while fading up from black might imbue it with a sense of mystery and calmness. He adds, the motion itself can be the message. It is essential to understand how motion can be used as a great expressive element in abstract animation. Motion is a powerful tool to evoke responses from the viewers. Different phase of motion portray different meaning and moods. For example a massive and fast motion of objects in animation may arouse a strong feeling to

the audience. The meaning of motion in animation relies on conventions and artistic techniques.

> Animation is the art of creating movement, generally employing inanimate objects but sometimes through the use of live figures whose movements are posed on a frame-by-frame basis. The characteristics of created movements can vary significantly: an object can move fluidly and rhythmically; in short incremental bursts; slowly and hesitantly or in a multitude of other ways that all suggest meaning to the viewer.
>
> (Furniss , 1998).

Timing

Timing is the control and the manipulation of time and motion. Structuring the time is pivotal in abstract animation as it gives meaning to the movement of subject/object literally. As explained by Jon Krasner in his media aesthetic book, there are two types of subjective time which are pace and rhythm. Pace referred as perceived speed of an event segment, for example the slow pace of a drama and the exceptionally fast pace of a musical. Rhythm referred to the flow within and among the event segments. It is determined by the pace of the individual segments and how they relate to one another and it provides the underlying beat of the abstract animation piece.

> Timing is categorized into pace, tempo, rate and ryhthm which refer as subjective time. Pace refers to the perceived speed of the overall event, tempo and rate refer to the perceived duration of the individual event sections, and rhythm refers to the flow within and among event segments. In media practice, there are limits to pace and rhythm.
>
> (Zettl, 2011).

Timing is more dependent on feeling than measurement. An animator need to approach the control the pace and rhythm using intuition rather than logic. For example slow motion of an objects in animation will potray different message than the accelerated motion. Structuring of the motion field, the control of pace and rhythm requires animators's sensitivity and experience. Establishing timing is high on the list of priorities of animators. If the visuals cuts do not establish an obvious rhythm, a rhythmic sound track will provide the neccessary beat. It allows the animators to be expressive in controling and manipulating the timing of a certain motion (Zettle, 2007).

2.5 Projection Mapping

> Over the past decade, the growth of digital technologies plays a vital role to create computer-based artworks to display. Digital installations, branches of video arts, are started to apply not only on a flat screen but also on public spaces. These kind installations are called ‘Projection Mapping’.
>
> (Ekim, 2011).

Projection mapping also known as video mapping is a newest projection technology. It has a unique ability to deal with physical space and digital content in a way that is compelling in visual culture. Often display at events such as concerts, installation arts, exhibition, campaigns, launching, fashion shows, music festivals, and usually in conjunction with other performing arts. Projection mapping are performed live as well as prerecorded, also called as real-time. Artist used the technique to project animation or audio-visual content onto any structured physical objects. These objects may be a simple geometric sculpture, buildings or even complex architecture. Essentially, the idea of projection mapping is to create a physical illusion of images and turn almost any surface into a dynamic video display by integrating

audio-visual elements. (Ekim, 2011). French visual artist Joanie Lemercier briefly explains that 'the basic idea of project mapping is to send light really precisely on to objects. It is almost the opposite of projecting a video onto a flat rectangular screen'. He adds, 'the great thing about project mapping is the artist can use any object or any surface; projection mapping can be done on to architecture and building, to sculpture, to paintings and to almost any different structures'. As projection mapping being part of a merger between media and architecture, it gives space a meaning that can be experience by the audience.

2.5.1 Techniques of Projection Mapping

According to Jean Michel Verbeeck, the artist or visual enthusiast needs to have certain skills to be able to create a projection mapping. They should have good knowledge of animation and video. Having visual-spatial intelligent is also necessary if the artist wants to make their own physical sculpture. He adds, the most important is to be up to date with all the available softwares related to projection mapping.

It requires the artist to understand the technical parts of beaming the audio-visual images onto 3 dimensional objects. The moving images need to be adjust and mask perfectly to follow the shaped of the target objects. The result can be dynamic, effective, eye catching as the audio-visual images are no longer a flat on the wall but becomes an object in spatial area. It can also be referred as animated sculpture. It often relates in adding to add extra dimensions, optical illusions, and notions of movement onto static objects as well as to play with the audience perception.(Ekim, 2011). Projection mapping uses specialised software and other technologies as tools to warp and blend projected images to fit perfectly on any shape such as physical sculpture and architecture.

2.5.2 Digital Technology and Art

> Advances in digital technologies are having undeniable (inevitable) influence on contemporary arts and culture. The world wide web (internet) has not only emerged as an Advanced Mass Communication tool of the 21st Century but also has emerged as a new tool for contemporary artists thus enabling an expansion in the limits of creativity and progression of new forms of authentic expression.
>
> (Ekim, 2011).

There is no question the digital technology has given the artists' new ways to create music, animation, paintings, sculpture and illustration and new whole ways of stimulating people's senses. Computer technologies can be regarded as a complementary tool for artists in creating new form and remarkable artwork. Projection Mapping is one of the creative outcomes of what technology has enabled in the 21st Century. Projection mapping is often referred to as an exciting contemporary artwork where its' production is provided by the collaboration of arts and technology.

> ...Artist are revisiting the constituent tools of expression in moving image forms to express their vision…By reengaging with technologies and established grammars of expression, there are always provocative ideas that can be readdressed through new technologies and grammars of expression, which can then emerge from cross-disciplinary practices.
>
> (Wells and hardstaff 2008: p118)

The use of digital technologies has create new spaces for the artist to experiment with new style and techniques that goes beyond boundaries in producing new relevant and timely digital art. In recent years, the advancements in digital technology have exerted influence over subsequent generations of animators and digital artist. (Wells and Hardstaff 2008: p120).

2.5.3 The Role of Music in Projection Mapping

It is amazing how the computer has become an instrument for forging music and image connections in creating music inter-related with active colour and visuals. Though the language of complementary is still under-examined and experimental but the visual music practise of today is diverse and wide-ranging. The technical innovation in softwares/ hardwares is thus providing the means to begin a fine art for eye and ear. (McDonnell, 2007). Through projection mapping, sound and image connections not only constitute animation's core language, but it has increasingly sought another dimension in its presence through space.

> The non-representational nature of music and its emotional expression is mirrored in the non-representational nature of the resulting imagery that also expresses and appeals to emotions. By exploring the visual with musical thinking, artists create new visual forms, new patterns, and new relationships between visual elements. Abstract painters such as Wassily Kandinsky (1879-1940), Paul Klee (1879-1940) and Roy De Maistre (1894-1968) worked with music concepts and idea, translating them into their own ideas and principles for artistic practice.
>
> (Mcdonnell, 2007.)

In order to create a succesful abstract animation or projection mapping, every animator or artist must think about the nature of sound, and its' relation to the timing of the action. According to digital artist/composer Brian Evans in many senses, the crucial relationship between animation and sound remains relatively unexplored and in some ways undervalued. It is essential to understand the importance of the relationship between sound and abstract image.(Wells and Hardstaff 2008: p120). Projection mapping offered opportunities for animators/artist to continue this exploration, as music and image making technologies began

to merge. Advantage from this, animators/artist able to continue finding their own connections between music and sound and use these parameters and characteristics of sound in different ways to express their art.

2.6 Artists Reference

The case studies are based on selected works by visual artists who focus on projection mapping and abstract animation. They are Joanie Lemercier, Jean Michel-Verbeeck and Oskar Fischinger. Lemercier and Michel-Verbeeck are the artists who have been responsible for quite a bit of volumetric projection mapping on both existing and designed structures. Their works involve geometrical form in a very elegant way. Fischinger's work explored colors, geometrical abstraction and their relationship with sound. The observation from the case studies will help to form the overall design for the project.

Joanie Lemercier

Joanie Lemercier is a French visual artist with a graphic design background. After few years of doing classic Vjing in clubs and festival in Bristol (UK), he starts to experiments visual projections onto augmented sculpture and transparent materials away from the standard rectangular screen. Joanie with three other visual artists from Europe created a visual label in 2008 known as AntiVJ. They produce and develop audio-visual projects, installation, architectural mappings and stage design. Their projects have been presented all around Europe, in Russia, Canada, USA, Mexico, South Korea, China and New Zealand.

> Joanie has been obsessed by geometry and minimalism for years, and most of his work has been very clinical, cold and more abstract than figurative or realistic, and he

wanted to work with more organic shapes, and start using curves, less angular patterns. Being fascinated by the relationship between maths, geometry and nature, he wanted to explore that idea in his work, and incorporate some visual elements that would connect geometric patterns and ocean waves, terrain, mountains relief, wind, snow and rain motion.

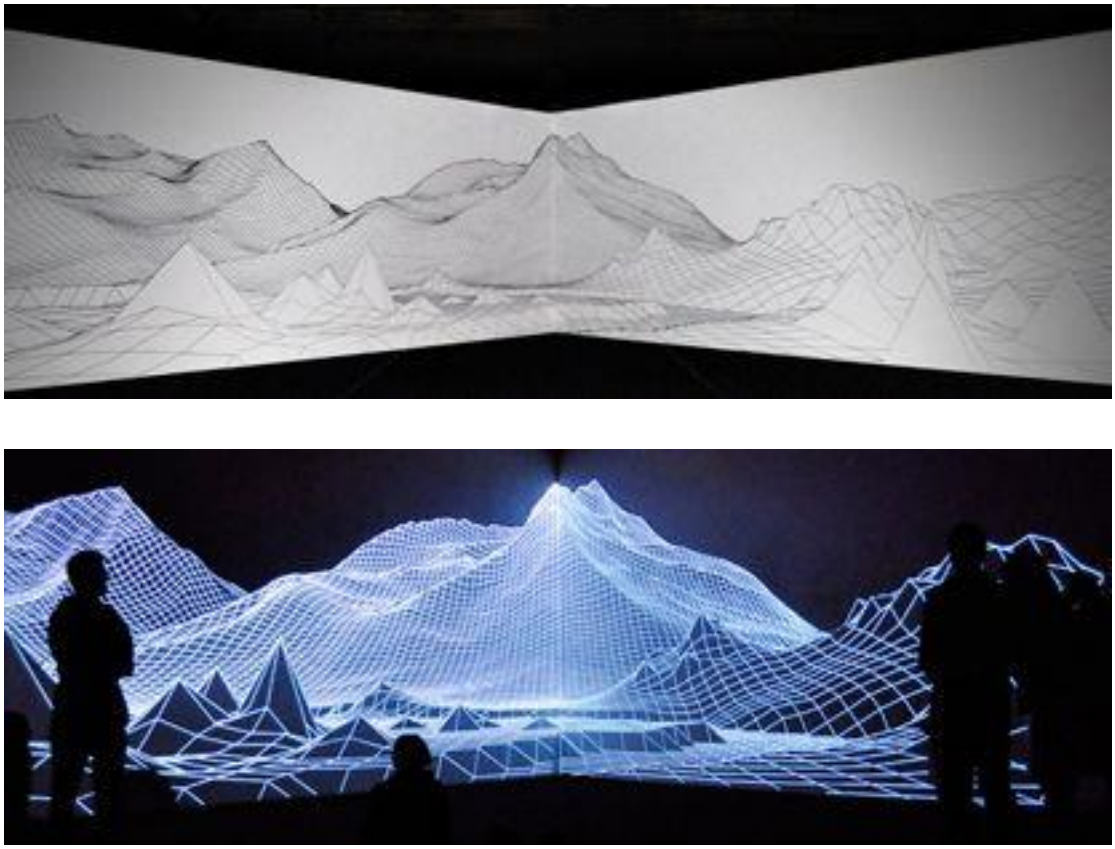

Figure 2.1: Shots of Eyjafjallajokull installation. Image courtesy of Joanie Lemercier.

Artist: Joanie Lemercier

Title: Eyjafjallajökull (2010)

Description: Audiovisual Installation with projection Mapping

The project was inspired by the Icelandic volcano eruption. Wireframe scenery of mountain like of volcano was painted directly onto a large wall to perform as projection mapping canvas. The visuals were done in 3D software. It was rendered by virtue of some complex

volcanic wireframe and the ever-stunning technique of projection mapping. The scenery was slowly revealed by light effects imitation of volcano larva eruption. The project plays with the audience's sense and progressively challenged as optical illusions question their perception of space. The numerical treatment of the part is to believe our senses that we are in the presence of erupting volcano. From his interview with Creative Application Network, Joanie describe the end of the piece as a bit more abstract and futuristic, with waves of light going through the wireframe soil and the volcano.

He adds the idea of *Eyjafjallajökull* was to project a layer of light onto a painted visual. He then construct 3d animation as the “virtual layer” to create depth effects and enhance the visual by adding colours, line effects and motion. His intention is to play with the audience visual perception, by making this 2D visual appear as if it was an actual three dimensional structure.

Jean Michael Verbeeck

Jean Michel Verbeeck is a motion and graphic designer from Antwerp with a background study of Graphic Design & Animation. In 2010, he founded Konstruktiv Media Labs, his personal portfolio and visual playground. Since then, he has been exploring the world of illusions and their relationship to modern technology. According to Jean-Michael in his Behance Network profile, being in contact with the audience through an emotional level of energy is very important to his work. His work is not only narrative in abstract way but also brings the audience in an emotional state of mind. The most amazing about his work is the execution is very exquisite. In his interview with 'The Creators Project', Jean-Michel express:

> My work involves video mapping, light canvases, and other visual installations which are stripped down to their most fundamental features and created with a minimalistic

approach. I'm fascinated by technology and the human brain, and in all of my work I try to find the right balance between what is real and what is digital, with the purpose of bringing the audience into a state of self reflection. In other words, I try to show the audience that there are not only new perspectives, dimensions, and possibilities in the digital world, but also in our reality.

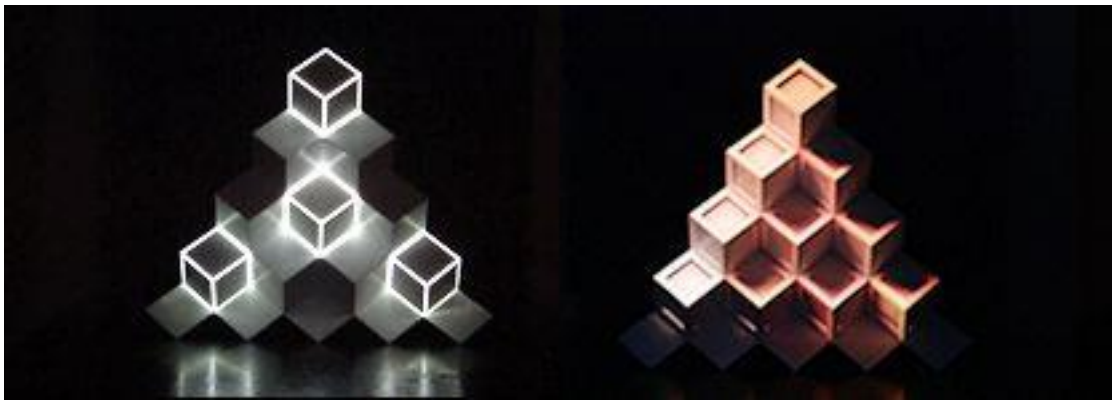

Figure 2.2: Shots of Hexastruct augmented sculpture. Image courtesy of Jean Michel Verbeeck

Artist: Jean Michel Verbeeck

Title: Hexastruct (2012)

Description: Hexagonal Projection Mapping - Augmented Sculpture

The project was an amazing projection mapping that perfectly mapped onto physical object made out of 10 box arranged as a hexagonal-pyramid shape. *Hexastruct* is a visual wonderment through stunning colour, geometry and motion with sophisticated and clean execution. It depicts a visual illusion of massed cubic forms. The playful cubic patterns alter their shape and texture to create mesmerising visual sequences. The atmosphere it creates between the audience and the space is sensational.

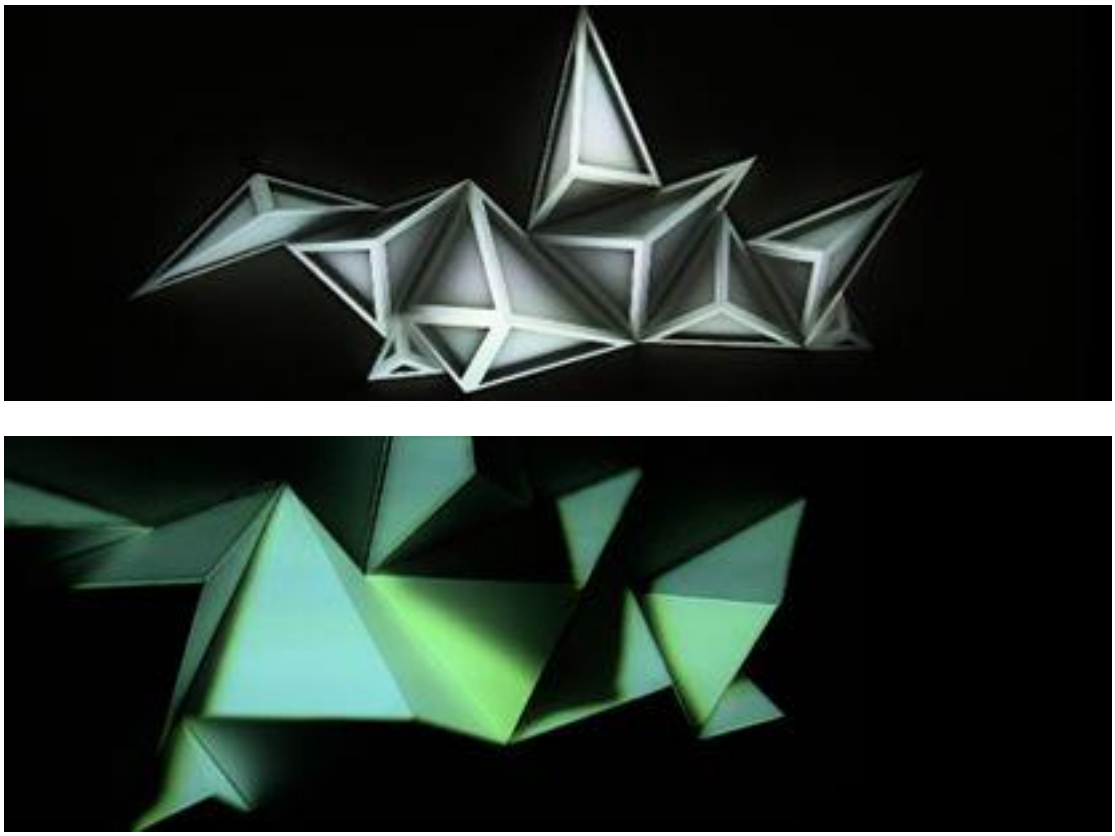

Figure 2.3: Shots of Labyrinth augmented sculpture. Image courtesy of Jean Michel Verbeeck

Artist: Jean Michel Verbeeck

Title: Labyrinth (2010)

Description: Augmented Sculpture with Projection Mapping

Labyrinth is an exquisite projection mapping piece with immersive visuals and good music. It is well executed projection mapping on difference shapes of augmented triangles. Its visuals vary from colours, shapes, forms and dynamic motions that parallel with the sound beats perfectly. The interlinked between its visual and music creates emotional linked between the space and audience.

2.6.3 Oscar Fischinger

> Oskar Fischinger is regarded by many as the master of abstract animation . Trained as an engineer, Fischinger was profoundly affected by this early milieu and dedicated his lifetime to artistic expression. His work created by frame-frame, represents the type of control and inspiration that a master composer wields over musical form. His series of films, drawn frame-by-frame with charcoal, all had musical accompaniment. However these films are not visualisations of music but provide visual counterpoint, becoming another parallel expression and interpretation.
>
> (Snibbe and Levin, 2000).

Fischinger played an important and influential role in the development of early abstraction in film during the interwar period. In 1920, Fischinger started developing and experimenting with numerous technically advanced methods of producing his highly artistic abstract films, animations and special effects. Fischinger's abstract film experiments exploring time, motion, and music resulted in a groundbreaking series of studies synchronised to music. Using music to give his abstractions a more accessible compositional structure, he paved the way for an art form that came to be known as visual music. Rather than being direct expressions or illustrations of music, his sound films explore various relationships between image and sound. He is pioneered one of the first immersive multimedia performances using abstract films, creating dynamic new possibilities for cinema as an art form (Taylor-Turner, 2009).

Figure 2.4: Shots of Early Abstraction installation. Image courtesy of The Fishinger Trust

Artist: Oscar Fischinger

Title: Early Abstraction (1946)

Description: Early Exploration of Geometric Forms, Colors, Motion and Music

Early Abstraction is one of the earlier explorations of abstract imagery into moving images. It has created a new abstract film language that parallels and interacts with musical qualities referred as abstract animation.

Fischinger's exploration on the motion of shapes, colour and its relationship with sound gives emotion to every element in this animation. The colours, the geometry and patterns, its sense of timing gives a pleasure experience and an inspiration to the viewer.

CHAPTER THREE

STUDIO PROJECT AND METHOD: DISCUSSION AND ANALYSIS

3.1 Theme / Subject Matter

This thesis project is a result from my interest of relationship between technology and the arts. The digital revolution has consolidated major changes in moving image thus expanded the animators/ artist ability to express their vision (Wells and Hardstaff, 2008). According to Aylish Wood's Digital Encounters, animation or moving image media are becoming increasingly popular by visible evidence of the technological interventions used in their creation such as the growth of projection mapping.

Initially, I seek for a medium that would give me freedom to express my thoughts. I sought after a project that would challenge me to expand my animation into fine art. As a result, I chose to combine my interest in the technical aspects of animation, and the anticipation to explore the art of projection mapping to an expressive art form. After having a clear direction of where the project will take, the next stage is defining the subject matter and the aesthetics of the project. Since I have always been fascinated by geometrical abstraction and the natural world, I am intrigued to incorporate visual elements that would connect geometrical patterns and natural elements driven by music as the thematic components of my abstract animation. It attempts to represent a continuous involvement with abstract forms through the manipulation media aesthetic elements; of colour, light, motion and timing. It requires exploration in many aspects before attempting to produce the final piece. Hence the paper covers topics ranging from the aesthetic elements of abstract animation, the art of projection mapping and its techniques to execute the project. This will give extra details in creating meaningful abstract animation.

> Artists have a particular aesthetic view or philosophy. Some embrace the styles and beliefs of specific movements, such as realism, expressionism or others have a more eclectic or personal approach.
>
> (Hadden 2004)

The inspiration of creating this thesis project is influenced by the Lebanese-American poet; Khalil Gibran (1883-1931). His famous quote, "Trees are poems the earth writes upon the sky, We fell them down and turn them into paper; That we may record our emptiness" is the first phrase that spurred the initial direction of this project. His wisdom and reasoning of thoughts question the beautiful elements of humankind and its existence. Through my perception, I attempt to abstract its meaning and transfer my interpretation into abstract animation. I deeply fascinated by Gibran's humble writing about human relation with the natural world. That is what has driven me to choose one my favourite quote of his. Based on my understanding of the quote, its quest is about the human relationship of love and harmony with the natural world. Deep down human nature yearns for that. It imposes the lost of nature in the urban landscape and points out humankind's loss of its primal bonds with the natural world. Personally, my longing to the peaceful natural world and experience in life is what influenced my interpretation to Khalil Gibran's quote. Growing up most of my life in a home opposite to the beautiful beach in Kemaman, Terengganu makes me feel so attached to the natural world. To be surrounded by nature or even simple things such as stems and blessed with beautiful natural view everyday had brought me great pleasures. The beautiful feeling of enjoying its beauty is an aesthetic experience for me. It makes me feel content about myself when I am surrounded by beautiful gifts of the Most Creative. It brings me to another state of mind deep within my inner self. Literary, it forms how I perceive things in life. Reflecting

this beautiful atmosphere I have experienced and now slowly gone is so upsetting especially when reflecting on how we live today. Sadly human eagerness to make the world vibrant and intense is slowly causing destructions to the natural world.

From a personal standpoint, my interest in producing abstract animation through projection mapping comes from the fascination towards 3D abstract animation. The core idea behind it is that it combines two powerful elements of art; music and motion. Being fascinated by the relationship between audio, motion and nature, I wanted to explore that idea in this project. The interlinked between music and motion creates amazing experiences and perception, not just in my mind but to my surroundings. I refer to it as audio visual journeys through music and space. Exploring them through projection mapping extends the potential of both elements into an expressive art form and to physical space. It is highly intriguing how digital technologies provide the opportunity for animators or artists to explore and create the parameters of image and sound in imagined and unimagined ways (McDonnell, 2007). Through this research, I wish to express my thoughts through the abstract motion of geometrical forms, colours and music. I believe animation should aspire to be as abstract as music, with groups of colours and motion relating to one another just as chords is related to music. Music plays powerful elements that evoke human emotion and ability to spark beautiful things in the human mind. It sets a mood, like joy, peace and sorrow. That is how I became passionate about music interlinked with motions and visuals. The partnership of audio and visual phenomena often triggered the presence of beauty in my inner and the outer world. Through this project, I want to wake people's sense of wonder as I experience from the audio visual phenomena and inspire them with a sense of harmonious feeling with nature.

3.2 Early Exploration

Early exploration of the animation was done in the 3D animation software: Autodesk Maya. The focus at this stage is to experiment with 3D motion of geometrical abstract forms. The experimental studio work followed with a strong focus on the animation style that could give destructive effects when projected directly to the wall. The animation were syncing accordingly to the music beat. It is divided into two parts. Part one is about the earth that we live now and hopes that it still holds. Part two is about the human eagerness in making the earth more vibrant and intense with human superficial needs. It deals with the dynamic motion of various geometrical forms to replicate the sense of destruction.

The core idea of the project is to project a 2D animation layer onto a 3 dimensional physical wall (see Fig. 3.1). The 2D animation itself plays a lot with shadow and depth and the visual were enhanced with destructive motion. The intention is to create depth effects and play around with the viewer's visual perception, making the 2D animation visuals appear 3 dimensional. The intention is to explore the links between depth/space and the illusions of perception. This exploration is important for me to understand depth effects and how it affects visual perception. The second phase of the project is the projection mapping which extends the abstract animation to the physical space.

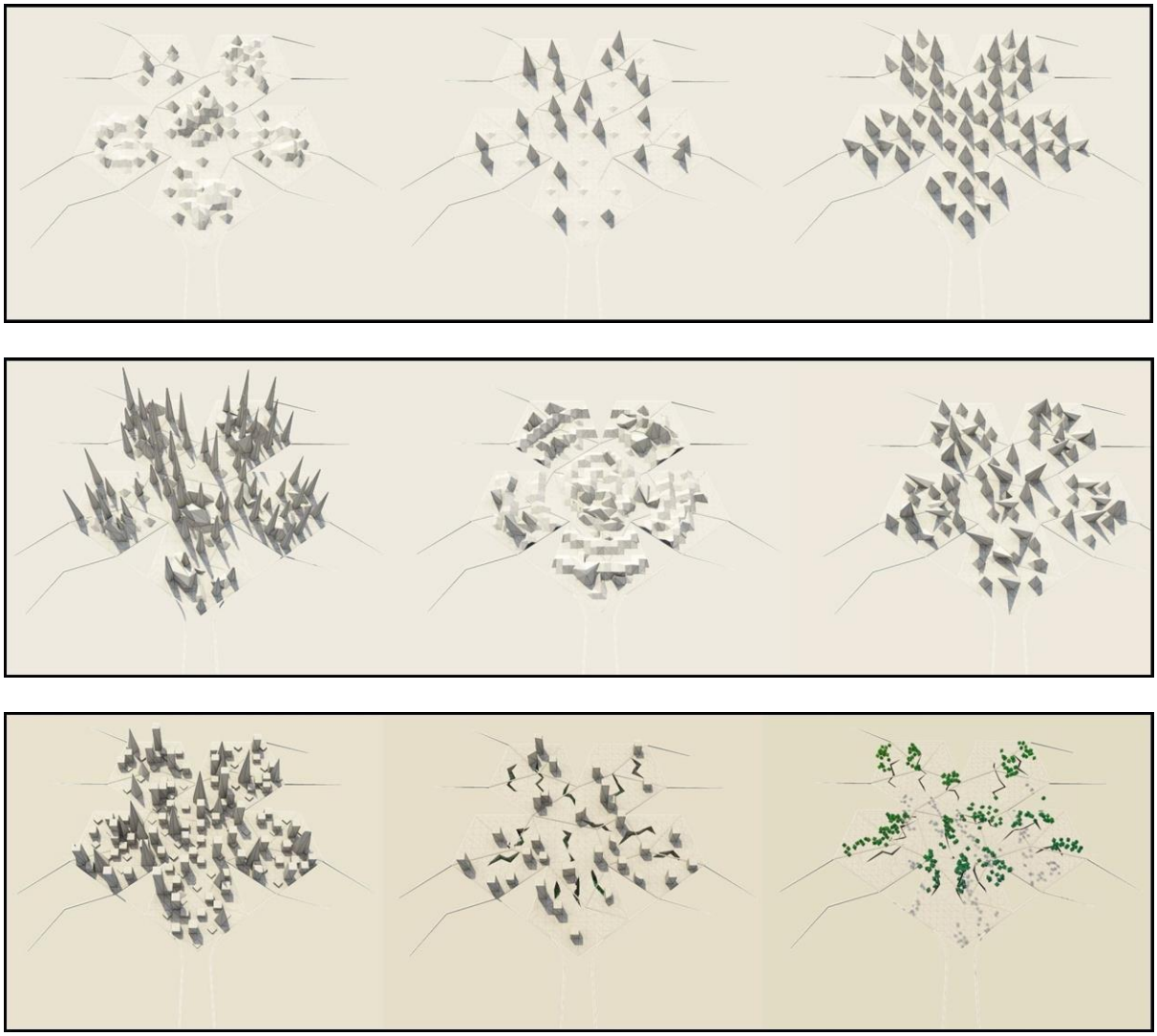

Figure 3.1 Shots of final visuals from the early exploration. The abstract animation is projected to the wall to give depth effects and play with the viewer's perception.

3.3 The Project: *Illuminates*

Illuminates is an abstract animation mapped onto 24 pieces of white pyramids sculpture placed on the wall in a pentagonal arrangement using projection mapping technique. The execution of the project is to enable the viewer to engage with the abstract animation in a physical space. The shape of the sculpture is abstracted from Piet Mondrian's painting "The Gray Tree" (1911) to be used as a projection mapping sculpture as well as the animation base form. It is simplified to 24 pieces of pyramids arranged into six pentagons (see Fig. 3.2),

which is inspired by the common flower petals and tree branches to represent the natural world.

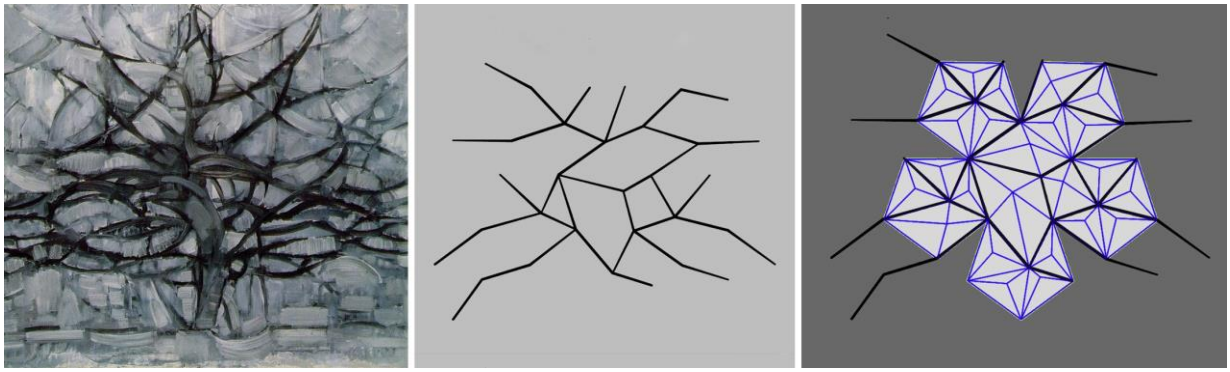

Figure 3.2 The pyramid is abstracted from Piet Mondrien's Grey and simplified geometrically as a projection mapping sculpture.

The animation was constructed and rendered in 2D and 3D animation softwares. It is driven by non-lyrical music beat. The entire animation lasts approximately four minutes. At 30 frames per second, this is equivalent to 7200 frames. This work seeks to address two elements: a harmonious feeling with nature and a sense of destruction due to human eagerness in making the earth more vibrant and intense with their superficial needs. Its core idea is to represent both elements through abstract animation; light, colour, motion, sound and timing. Artists conceives and forms their image of the world through directly perceivable sensory qualities such as colours, shapes, sounds and motions (Arnheirm, 1966). The visuals of the abstract animation are inspired by the complexity of nature through its range of colours, forms and textures (see Fig 3.3).

Figure 3.3 The aesthetic for the abstract animation visuals were driven by the complexity of nature. Images were collected from various online sources via Google Image.

Illuminates is a four-minute looping abstract animation that commences with minimal and definable geometries that gradually evolves into a rapid and complex motion. The effect culminates in an abstract experience to the viewer. In order to create a successful projection mapping onto physical sculpture, I need to be acquainted with the technical aspects and its relevant softwares. The pyramidal sculpture is used as a screen for the animation to be mapped onto. The mapping of the virtual animation onto the real sculpture is intended to give the viewers a sense of the physical existence of the digital objects. This corresponds to my interest in projection mapping: the mixing of the virtual and physical realities.

The process

The abstract animation has no storyboards as my attempt is to use music to drive the story line. Using the method of artist doing painting straight to his canvas allows me to be expressive while producing the visuals in animation software. The style deals with moving shapes according to the beat of the music. The music drives the shaping and designing of the visuals. It requires numerous experimentations with colours, lights, shapes, and motions, rendered into different types of shading in animation software to produce visuals that fit with the project theme. The proper choice of the visuals is important to make sure its design fits the overall style of the abstract animation. A range of visual styles and moods were used to allow more room for the visuals to flourish with the music (see Fig 3.2). Thus, the abstract animation contains a combination of geometrical forms with motions, colours and lights driven by music.

I chose to use audio works from Alva Noto's *Stalker* and Nosaj Thing's *Distance*. Alva Noto is a sound artist from Germany. His music is used in the first part of the animation in a symbolic to humankind's longing for peaceful natural world. Nosaj Thing is an American electronic musician. His music is used to fit the second part of the animation, to motivate the sense of the destruction.

Technically, Illuminates was rendered at 1024 x 768 resolutions, running at 30 fps using MacBook Pro OS X version and projected using BenQ - XGA DLP Projector - 2700 ANSI Lumens. The visuals was created with the animation software Autodesk Maya, composited in Adobe After Effect and edited in Adobe Premiere. They were then screened and mapped onto the pyramid sculpture with mapping software Madmapper. The pyramid sculpture was

made from 24 pieces of A2-sized display boards. These overall processes can be refered to Figures 3.5 to 3.10.

The exploration of the project to produce a body of work that potentially form the basis of an installation in art gallery finally meet its goal and exhibited in Penang State Museum Board, Georgetown Penang (see Fig 3.11 to 3.13).

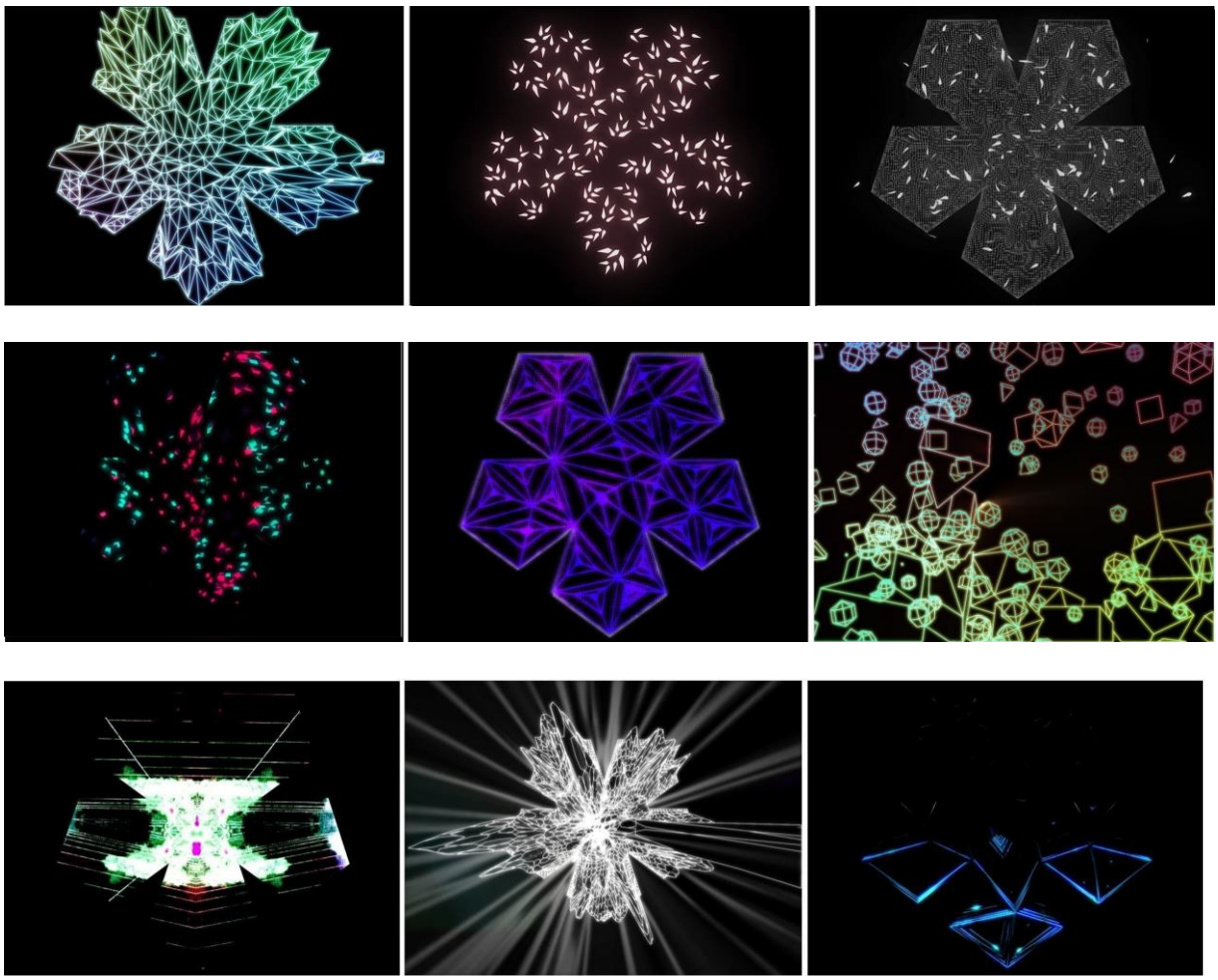

Figure 3.4 Shot of the final key visuals of the abstract animation. The visuals employ the media aesthetic elements that focused on this research. Technically the visuals produced in Autodesk Maya, composited in Adobe After Effect and edited in Adobe Premiere.

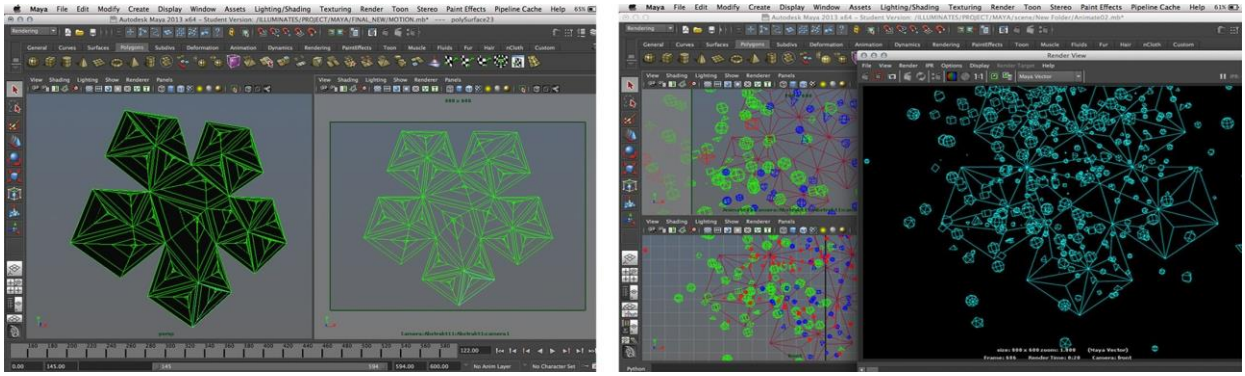

Figure 3.5 All the visuals of the abstract animation created in Autodesk Maya after countless of experiments and render in different shading in order to get the final look of the visuals.

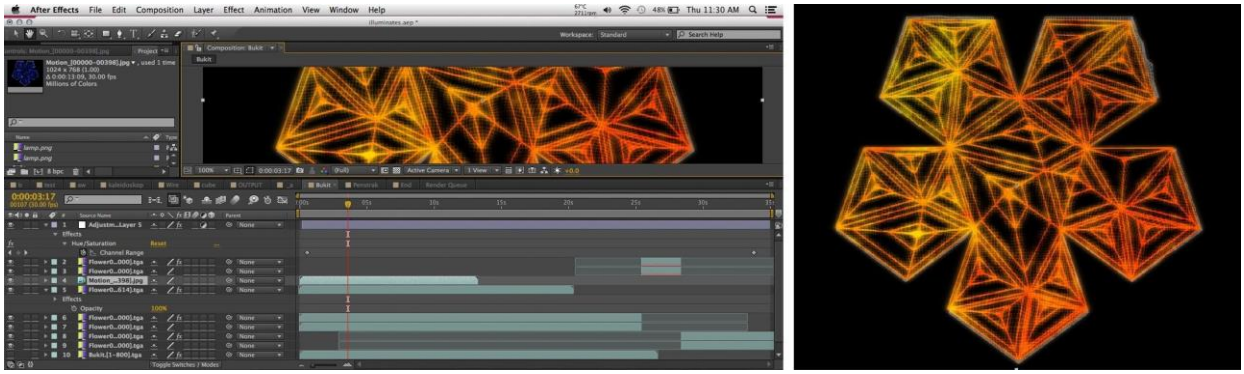

Figure 3.6 The visuals then composited in Adobe After Effects for post-production purposes. Effects added to the visuals to enhance the overall looks of the abstract animation.

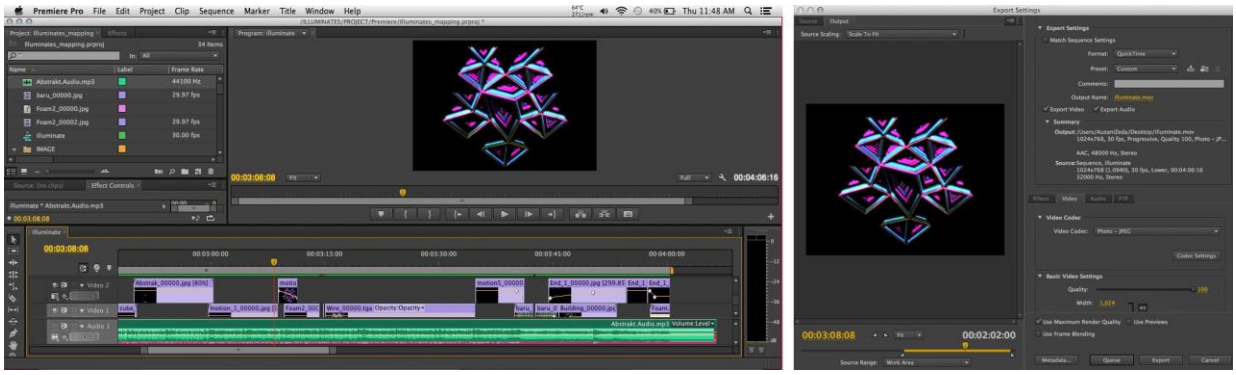

Figure 3.7 The abstract animation edited in Adobe Premiere to sync with the music beats and later render at 1024 x 768 followed the projector output resolution.

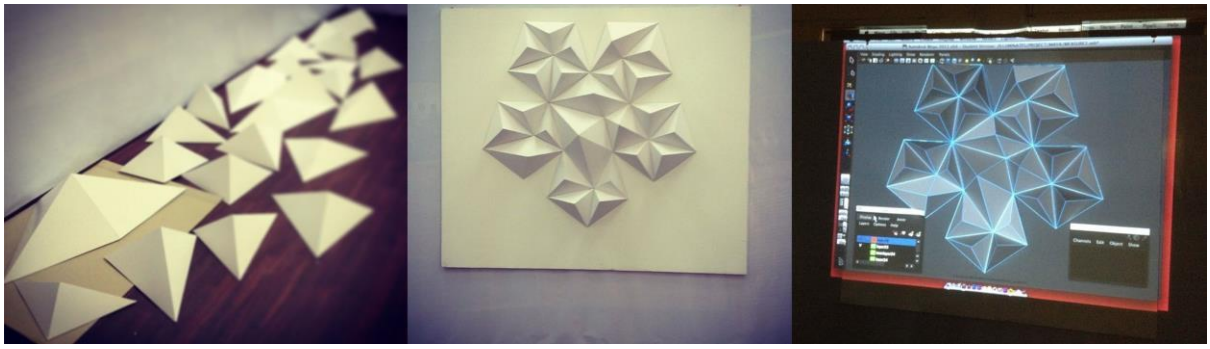

Figure 3.8 24 pieces of white pyramid sculpture folded using A2 size display boards and placed on the white plywood frame in a pentagonal arrangement and mapped with mapping software: Madmapper.

Figure 3.9 The abstract animation is projected using BenQ - XGA DLP Projector with 2700 Ansi Lumens.

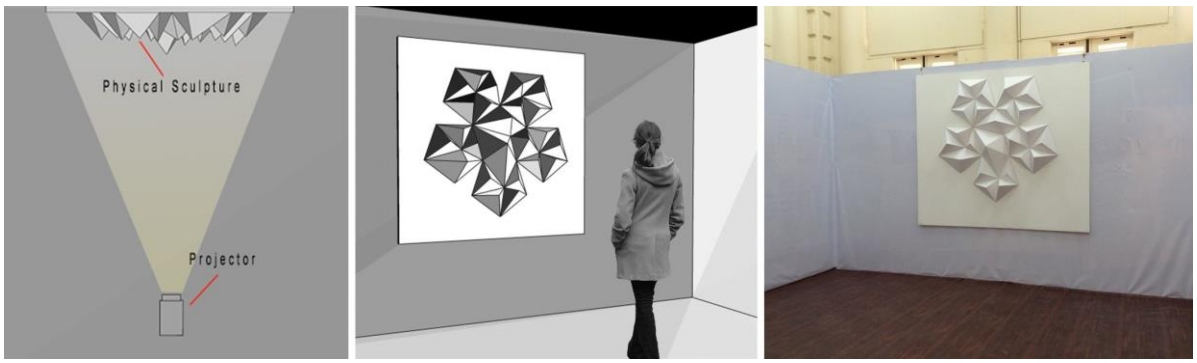

Figure 3.10 The projector is placed 13 feet away from the sculpture in 15 x 15 feet gallery room.

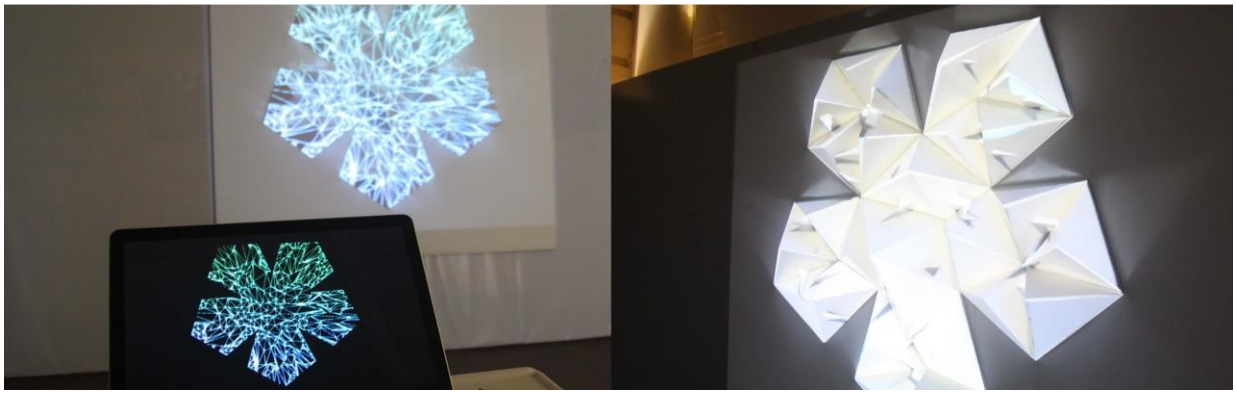

Figure 3.11 A screen shot of the abstract animation successfully mapped on the physical sculpture.

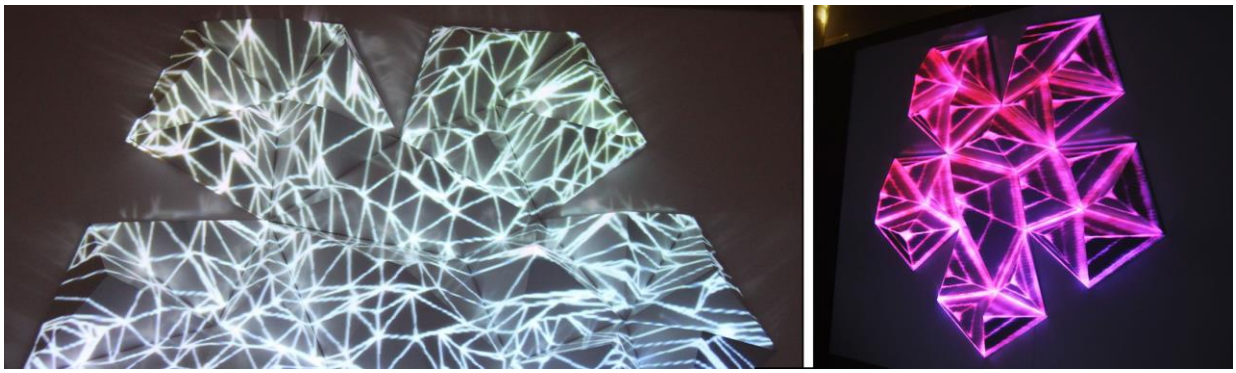

Figure 3.12 Shots of the final output of the projection mapping installation.

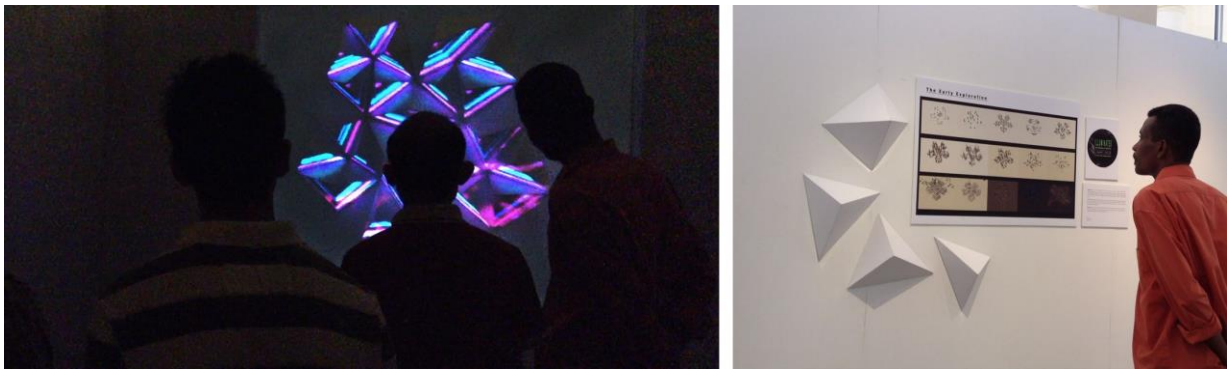

Figure 3.13 Shots of viewers experiencing the project during one of the exhibition days.

CHAPTER FOUR

CONCLUSION

4.1 Conclusion

The primary goal of this project is to understand and apply the aesthetic value of abstract animation through the art of projection mapping in creating an expressive art. From this research, I found that the content available to abstract animation is unlimited. There are many ways of expressing the thoughts and experiences of an animator or an artist through abstract animation. The message of the animation may not be obvious to the viewer as the story lines are not representational and may be subjective. However, the artist's openness to his or her ideas and experiences as well as his or her willingness to implement them into abstract visual language, allow viewers to "see" these experiences through their own personal interpretation. According to Pamela Taylor-Turner, an expert in kinetic imaging, it is in the animator/artist's nature to create animations opposite to the simple narrative structure that will appeal to audiences. True artists will take their medium, explore and push it to the limit in order to represent that which has not been seen before (Furniss, 2010). Through the expressive art form, viewers are given access to the inner world of the artists and their interpretation of this realm. In order to make successful abstract animations, artists should make full use of media aesthetics elements and employ them as guidelines. It enhances dramatic needs in animation to convey the emotional message so viewers can truly feel it.

Illuminates is an attempt to use technology as an expressive device adding to the deliberate obscurity of meaning to the abstract animation. Emerging technologies have allowed more possibilities for the artist working with moving imagery and light. Digital technologies offered yet another opportunity to continue the exploration of abstract animation, as music

and image-making technologies began to merge (Taylor-Turner). I learned a great deal about abstract animation and the art of projection mapping while working on this project such as exploring new techniques to create abstract visuals. There are still many technical aspects to be explored. I am content with the overall execution of the abstract animation through projection mapping in translating my thoughts into an expressive art form. I enjoyed the creative process in creating the expressive abstract animation and having the freedom to express my thoughts in the visual contexts. Through a better understanding of media aesthetics elements, I finally have found my own style and direction that I wish to proceed in future projects. The hardwork put in this work to make an effective abstract animation is worthwhile because I could never have imagined a better response to the artwork. The responsive and constructive comments to my project gave me confidence in my ability to continue with projection mapping installation that viewers can enjoy and appreciate.

The process in exploring the aesthetic of abstract animation, the art of projection mapping and its techniques was crucial in understanding the complexity and possibility this project may become. The proper choice of visual elements was made to make sure it fits with the overall abstract animation and audio to set mood to viewers' perceptions. Amounts of experimentation with colours, lights, shape, time and motion for the animation allow this project to achieve its goal in creating an expressive abstract animation through projection mapping.

4.2 Future Research

Receiving a lot of good responsive comments has made me excited to work on my next project. There are several elements that could be developed for this thesis project. I hope to revisit this work and make some new parts for a greater view and find my spot to be

recognized as a visual artist. I am ready to challenge myself with new ideas and styles of animation for future projection mapping installation. Thus, I am interested in to continue exploring the geometrical abstraction and media aesthetics, and their relationship to modern technology.

4.3 Recommendation

In order to create a successful expressive art form that links both aesthetic and technological aspects, it is best for artists to acquaint themselves with the aspects of digital technology. This can be done by acquainting through various applications, softwares and hardwares in adding endless possibilities to create new dimensions to their artworks.

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