Toward a Hybrid Aesthetic:

An Interplay Between Traditional 2D Hand Drawn and 3D Computer Animation for a Dream-Inspired Story

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Declaration

I certify that except where due acknowledgement has been made, the work is that of the author alone; the work has not been submitted previously, in whole or in part, to qualify for any other academic award; the content of the thesis is the result of work which has been carried out since the official commencement date of the approved research program; any editorial work, paid or unpaid, carried out by a third party is acknowledged; and, ethics procedures and guidelines have been followed.

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Abstract

This research is a conceptual investigation into visual storytelling techniques for a dream-inspired story, and an empirical study for the production processes of a 3D computer animation with 2D graphical representations. The major project of this research, Sophie’s Secret, is a 3D computer animated short film rendered with 2D graphical styles to tell a dream-inspired story. A methodological model is established to organize the multiple disciplines in relation to this research.

Theories in both psychoanalysis and biological study of dreaming significantly inform storytelling in moving images. Strong emotions and bizarre scenarios are the two overarching characteristics that have been identified in both psychoanalytical and biological studies of dreaming. I have used a dream-inspired story to evoke emotion and juxtaposed bizarre scenarios in the production. Layers of meanings are expressed in the animation through the use of symbolization and condensation, the two mechanisms of Freud’s ‘dream work’. The adaptation and reconstruction for the story from the original dream ideas were conducted for meaningful self-expression and effective communication. The narrative structure after adaptation fits into the classic three acts and the ‘monomyth’ structure.

A hybrid aesthetic with multiple visual styles is created in this animation to represent a dream-like quality. This hybrid aesthetic is achieved through visual referencing of traditional 2D line and cel animations, alongside 3D computer techniques. The visual referencing of 2D line and cel animations, and the aesthetic judgment, were based on my professional experience and personal interests. United Production of America’s (UPA) animations, especially Gerald McBoing Boing, and Japanese anime, are the two major sources I referenced, because both are produced to express story ideas with stylised imagery and simplified processes.

With the decision to create the hybrid aesthetic and 2D graphical styles in this animation, 3D production processes are significantly simplified and the workflow becomes more flexible. This simplicity and the flexibility also make possible the creation of multiple visual styles that enable the animation to represent a dream-like quality. It is proposed that, from the production experience of this project, emerges a set of strategies and a set of visual ideas that will enable the creation of hybrid aesthetics between 3D computer and 2D graphical styles. These strategies and visual ideas can be further applied in my future productions and will also be of benefit to animators and artists who intend to apply 2D graphical styles to 3D computer techniques.
Synopsis of Animation Project: Sophie’s Secret

Sophie encounters a worm on a street and the worm penetrates her chest and plunges into her body. The worm in the body becomes her secret. First she tries to get rid of it, but soon she is amazed to discover that her parents have worms inside them too. Finally she discovers a way to deal with this secret.

Figure 1  Still Images of Sophie’s Secret
Chapter 1

Introduction

The Sophie’s Secret project is a 3D computer animated short film rendered in 2D graphical styles by referencing traditional 2D hand drawn animations to tell a dream-inspired story. The research that centres on this project is a conceptual investigation into visual storytelling techniques for a dream-inspired story and an empirical study for the production processes of a 3D computer animation with 2D graphical representations. I explore theories and techniques that inform the animation production in its content, aesthetics and processes. This research is also a self-reflexive journey underpinned by my cultural context and professional experience.

The project outcome is encased in a DVD with a 3D computer animated short film, video clips of preliminary animated tests and sketches/documentation during the production processes.

1.1 Background

As a practitioner in the 3D computer animated filmmaking field, I am fascinated with the excellence, in both imagery and narrative, achieved by current feature length 3D computer animations. This excellence is a result of collaborations by artists and engineers (Schaffer 2004) using current computer technology with the support of vast capital in major Hollywood studios.

In my work as an independent filmmaker and an animator in relatively small studios, I always strive to achieve the highest quality of animated project within limited resources and on a relatively small budget. In the production of my previous 3D computer animated short film, Outside In (2004), I tried to apply a visual style that is similar to those in 3D computer animations produced in Hollywood (Figure 1). Characters and environments have high-resolution textures and the lighting in the scenes needs to be accurate to create the fantasy of 3D spaces. These 3D spaces resemble our real world. With this approach, I spent considerable time pursuing the standard of visual style that Hollywood studios have set. Furthermore, when I was developing the narrative ideas, I found that the story needed to be limited in terms of virtual locations. Without such limitations, my vision would be beyond my budget and the production time would be too long. These are the technical limitations for the storytelling development in 3D computer animation productions.
Toward a hybrid aesthetic

Another visual approach emerged when I was working in Los Angeles in 2005. I created a 30-second clip of 3D computer animation as a concept for a TV commercial for the company for which I worked. In this clip, characters and objects were 3D models, but were rendered as two-dimensional graphics to meet the demand that I create a visual style of pithiness and quick idea expression (Figure 2).

![Figure 2](image.png)  
*A still image of my previous animated project: *Outside In* (2004)*

Figure 2  A still image of my previous animated project: *Outside In* (2004)

Another visual approach emerged when I was working in Los Angeles in 2005. I created a 30-second clip of 3D computer animation as a concept for a TV commercial for the company for which I worked. In this clip, characters and objects were 3D models, but were rendered as two-dimensional graphics to meet the demand that I create a visual style of pithiness and quick idea expression (Figure 2).

![Figure 3](image.png)  
*A still image in an animated clip as a concept for TV commercial*

Figure 3  A still image in an animated clip as a concept for TV commercial
Surprised by how efficiently this project was accomplished and how effective the result, I became interested in representing ideas with 2D graphical styles in 3D computer processes. In the early stage of this research, I planned to explore the possibilities of creating visual styles by referencing traditional 2D hand drawn animations, especially the animation produced by UPA. From 1940 to 1950, UPA created visual styles with simplified, yet artistic, character and environment design so as to compete with the dominant Disney style, which was also the result of collaboration, and supported by vast capital – as is today’s 3D computer animations.

I also intended to explore the way in which production processes in 3D computer animations could be modified or simplified with 2D graphical styles for greater artistic expression. A similar visual approach for animation production has been created since Gas Planet (1992). Nonetheless, my approach is to directly reference traditional 2D hand drawn animations and frame the investigations in an artistic research form. My work will be of benefit to other independent filmmakers or small studios. To ensure modified processes are achievable, the modifications and technical experiments have to be based on the standard production process in 3D computer animation. Production tools must be commonly-used computer software.

In regard to the story idea, I chose a script I had written for the script writing class when I was studying in Rochester Institute of Technology, New York, USA in 2001. The story is based on one of my wife’s dreams, which I adapted to make suitable for an animation. The story idea interested the lecturer and was selected for a discussion in the class. I was also highly interested in the idea and thought to produce a 3D computer animation based on this idea as a personal project. However, this dream-inspired story takes place in several different locations of great scale, such as cityscapes, suburbs and countryside, and at that time the only visual style of 3D computer animation I could think of was the mainstream Hollywood style that I had used in Outside In (Figure2). My concerns about time and budget therefore, suppressed the possibility of this project. At an early stage of this research, I recalled this idea and believed that the story idea was feasible as a 3D computer animation production using a 2D graphical style similar to the one I used in Figure 3. The development and the employment of multiple 2D graphical styles by referencing various traditional hand drawn animations also helped to visually express the nature of dream as the source of the story idea. Moreover, it was also a suitable project through which to experiment with production processes and techniques for the development of multiple visual styles.

In the later stage of the animation production, I was fascinated by the relationship between dreaming and storytelling in moving images, since the animation is a dream-inspired story. I then started examining a wide range of dream theories and film studies, searching for the link
1.2 Aim and objectives

The aim of this research was to construct a theoretical framework through practice and reflexivity in the production of a dream-inspired 3D computer animation with 2D graphical styles.

The major objectives of this research are to investigate the relationship of dreaming, moving images and storytelling; to explore possible visual styles by referencing traditional 2D animations; to experiment with modified production processes for the creation of 3D computer animation for efficiency and effective self-expression.

1.3 Research questions

In this research, I intended to investigate dreaming theories that inform the storytelling in moving images and to explore the possibilities offered by the adaptation of dreams for storytelling. Dreams have been inspirations for many art creations, including film productions (Hartmann 1998). However, the questions: why do dreams have such impact on art creation, and how do the theoretical concepts of dreaming inform the storytelling in moving images productions, are rarely discussed. I explore and link multidisciplinary fields to provide accounts for these issues. I also explore visual storytelling techniques to create a dream-like quality of moving images and examine issues regarding the narratives adapted from dream ideas.

In this research, I aimed to create alternative aesthetics, which are different from mainstream 3D computer animation, and to explore possible visual styles of 3D computer animation by reviewing and referencing 2D animation traditions. 2D animation had a long history and tradition before the increasing popularity of 3D computer animation in the past decade. Some traditions, such as animation principles, have been applied to, or proved to be useful to, 3D computer animation production (Harvey 2006; Lasseter 1987). However, discussions about the aesthetic concepts that 3D computer animation artists can learn from 2D animation traditions, continue (Solomon 2005). My approach in the animation production creates hybrid aesthetics between 2D animation and 3D computer animation.

In this research, I intended to explore the possibilities of using the simplified and flexible production processes of 3D computer animation for artistic expression. The production of 3D computer animations is often a collaborative work for a commercial purpose. Beyond its commercial application, animation is also considered to be an art form for self-expression.
International film/animation festivals provide showcases for animators to present new ideas, styles and techniques for short animated productions. Some 3D computer animators seek to express themselves through producing animated shorts. However, the complication of 3D computer processes often lengthens the production time for individuals or small studios as discussed earlier. In this research, I investigate 3D computer animation processes, through the practice of a short film production, in an effort to achieve an efficient and flexible workflow for a work of self-expression.

The main problem in the practice of the animation production is:

**How can 2D graphical styles be developed in 3D computer processes to tell a dream-inspired story in a form of animation?**

The fundamental issues underpinning the main production problem are:

1. How can theories concerning dreams and the unconscious inform the storytelling in animation? How can dream ideas be adapted for storytelling to represent a dream-like quality?

2. How can 2D graphical styles be created in 3D computer software by considering the references of traditional 2D animations? How can these visual styles fit within the existing aesthetics context?

3. How can production processes in 3D computer animation be modified for 2D graphical styles as artistic self-expression?

### 1.4 Overview of the research fields

My research is closely related to the emerging research fields that uphold art and design practice. The fields include practice-based research (Pedgely 2000, 2007; Scrivener & Chapman 2004), design-based research (Barab 2004; Bennett 2006; Downton 2003; Laurel 2003) and art-based research (Finley 2005; Leavy 2009; Martin & Booth 2006; McNiff 1998; Sullivan 2005).

Practice-based or practice-led research is defined by Pedgley (2007, p. 463) as:

**...a mode of enquiry in which design practice is used to create an evidence base for something demonstrated or found out. It involves a researcher undertaking a design project subservient to stated research aims and objectives...the main motivation of practice-led researchers is to elicit and communicate new knowledge and theory originating from their own design practice**
My research is centred on the practice of a creative project. Both the practice of the animation project, and the documentation originating from my practice, follow the research aims and objectives and therefore help to answer my research questions.

My research shares some characteristics with design-based research. Firstly, one category of design research, called research for design (Downton 2003, pp. 17-8), is often carried out to facilitate design activities for a specific project. Secondly, interdisciplinary or multidisciplinary theories are often applied in design research (Sevensson 2003). Thirdly, both empirical studies and intuitive interpretation are important methodological approaches in design research (Tarbox 2006). These are also characteristics in my research.

My research fits into the art-based research methodologies. Art-based research overlaps and interrelates with the field of practice based and design based research as discussed previously. Artistic practice is the core of art-based research (Sullivan 2005). Art and design share aesthetic notions and principles. McNiff (1998) proposed a framework of art-based research for the discipline of art therapy. The methodological approaches in his framework underpin my research, which is centred on art practice. Methodological implications of art-based research are discussed in Chapter 2.

1.5 Scope and limitation

This research is an interdisciplinary study. I explored a broad range of fields including psychoanalysis, neuroscience, narrative theories, film theories, animation studies and graphic design. Within the vast range of fields, it is necessary to articulate the scope of this research and the issues that impact on it:

1. Since my animation project is a dream-inspired story, I focus on the investigation of dream theories that inform the storytelling in this research. Narrative is an expansive area of studies. Narrative can be verbal, visual or a combination of both. In this research, visual storytelling especially in moving images format is the major focus.

2. In this exegesis, I almost exclude any discussion about sound because it is not my area of expertise and is not the purpose of this research, although sound is an important element in any moving image production. In Sophie’s Secret project, I applied mostly music and sound effects and kept all the other sounds such as dialogue or narration minimal. With my experiences of living in different cultures (Taiwan, USA and Australia), I believed that the focus should remain on the visual elements and performance of characters, and that verbal elements should be used minimally to enhance cross-culture understanding.
3. Regarding the length of film: I set up the major project as a short film. Animation shorts are “often seen as the ‘research and development’ branch of the industry” (Pilling 2001) because most animations are extremely labour-intensive. They are often presented in international festivals. *Sophie’s Secret* is a completed artwork and also a test-bed to develop ideas in visual storytelling, visual representation and production processes. The discussion and findings about narrative are based on the short project. Some experiences and findings relating to narrative in this project may not be transferable to other productions of greater length. In terms of narrative, a feature length animation is likely to have different considerations from a short project. However, the visual ideas and production techniques are independent of the length and are possibly transferable to other productions.

4. Regarding the aspect of visual development in this project: many aesthetic judgments during production are based on my professional experience as a practitioner. For some parts of this animation project, I decided to faithfully reference certain visual styles I had selected to test the techniques in the 3D computer software. I did this for the purpose of research.

5. With regard to process aspects in this project: my focus is on the creation of animated images and the exploration of visuals styles with 3D computer techniques, but not on a specific 3D computer program. Similar visual ideas can be created with other 3D software packages. Most commercial 3D computer software programs share similarities in functions. However, different software may still have minor differences of algorithms and functions, and great differences in user interfaces. The major computer software applications I used in this project are *Autodesk Maya, Adobe After Effects* and *Apple Final Cut Pro*. 
Chapter 2

Methodology

I drew on methodological approaches from multiple disciplines for this research. Since the production of my animation project is a creative process, introspective inquiries were conducted throughout my production process. The aesthetic decisions for the production, and the visual styles of traditional 2D animation I chose to reference, are subjectively based on my own experience. On the other hand, the fact that my project uses 3D computer animation tools meant empirical inquiries were essential to solve technical issues. Experiments with the functions in 3D computer animation were carried out to achieve a desired visual outcome and to investigate novel production workflows.

In this chapter, I start with a philosophical overview of research and address my position for the essence of this research. Following the philosophical overview, I discuss the heuristic and reflexive nature of my research as an art-based inquiry. I then propose a research model to organize multidisciplinary materials that are centred on the practice of this moving image production.

2.1 Philosophical overview

A personal position as to what research is and why one does the research is essential in determining how specific research is conducted (Gray & Malins 2004, p. 18). Philosophically, the first question is an ontological question in relation to the researcher’s attitude toward the nature of world. The second question is an epistemological question where the relationship between the researcher and the nature of knowledge is sought. Deriving from Guba’s (1990) ‘paradigms of inquiry’, Gray and Malins stated:

*The choice of methodology should be a consequence of ontology and epistemology (Gray & Malins 2004, p. 19)*

Briefly, there are two main opposite paradigms of inquiry: *positivist* and *constructionist* (Stainton-Rogers 2006). *Positivist* ontology considers the world as an objective existence. The reality exists ‘out there’. The world is an ordered system in which events may be objectively observed. Accordingly, *positivist* epistemology regards the knowledge as gained through objectively observing and collecting facts from the world to discover the reality or truth. On the contrary, *constructivist* ontology regards the world as subjective. The world is what one knows about it. Reality is constructed experientially and socially by an individual. *Constructionist* epistemology thus considers knowledge as a construction rather than a discovery. This construction is
subjectively based on human meaning-making. For constructionist, there are multiple realities rather than a singular true knowledge.

Guba & Lincoln (2005) revised the ‘paradigms of inquiry’ by adding participatory as a new paradigm. Ontologically, the reality is ‘co-created by mind’ (p. 195) with objective knowledge and subjective experience. Epistemologically, knowledge is created by practical participation and creation. The emphasis of the participatory paradigm is on practical knowing and critical subjectivity.

I suggest that many research projects in the field of art and design, including my research, have a tendency towards constructivism and participatory. First, the quality of an artwork or a design is a subjective matter to both creator and viewer/user according to their experience. There are some rules such as colour theory for art production and theories such as semiotics used to analyse and criticize artworks. However they are usually loose and challengeable. In my experience of creative production, I have heard many times about conceptual rules from other practitioners and educational instructors in the field: “you can always break the rule if you know it and have a sound reason to break it”. There are multiple ‘realities’ in art and art creation. Second, the inquiry of knowledge in art creation and design production involves many human meaning-makings and decision-makings. The knowledge gained from such inquiries is more a mental construction and interpretation than a discovery of truth ‘out there’. My research made inquires through the practice of creative production based on my professional experience. The knowledge base derived from the experiments with visual styles is obviously constructed through participatory practice.

2.2 Heuristics and reflexivity

As discussed in Chapter 1, this research is closely related to the field of practice-based research, design research and art-based research.

Pedgely (2000, p. 113) discussed issues regarding practice-based Ph.D. programs in the field of design. He addressed the importance of self-empirical inquiries, which are investigation processes that faithfully reflect and record one’s own practice. These distinguish the research in the fields of art and design from other types of research. Practice needs to be framed by theory and by the work of other creative practices and practitioners. To form a contribution to a body of knowledge, one must have a methodology for the recording of activities when one I engaged in practice-based research, (Slager 2004).

In a broad view, my research is an art-based inquiry. It fits in with one of the traits of activist artists:
“use of mainstream media techniques (e.g., billboards, posters, subway and bus advertising, newspaper inserts) to connect a wider audience and to subvert the usual uses of commercial forms” (Finley 2005, p. 684). I use 3D computer animation as a form in mainstream production media to represent a self-related narrative with an unconventional visual aesthetic.

McNiff (1998) proposed a framework of art-based research in the field of art therapy. Concepts in his proposition are fruitful and underpinned the research in relation to creative activities. Heuristics is essential to art-based research (Finley 2005; McNiff 1998). In regard to the definition of heuristics, McNiff states:

*The Greek word ‘heuriskein’ means to discover and find. Today heurism connotes a method of learning through which knowledge is discovered through an inquiry based upon the examination of personal experience (McNiff 1998, p. 53)*

The heuristic research emphasizes direct and personal participation in the research process. This research is a heuristic inquiry that concentrates on the examination of my experience on the practice of the animation project. The inner-directed heuristic research helped to discover the possible meanings underneath the self-expression narrative in my animation project, the reason for selecting particular visual styles and how to solve the problem based on my experience.

Reflexivity is an essential characteristic in art-based research. Guba and Lincoln (2005) defined reflexivity as:

*The process of reflecting critically on the self as researcher...It is a conscious experiencing of the self as both inquirer and respondent, as teacher and learner, as the one coming to know the self within the processes of research itself. (p. 210)*

A *self-reflexive practice* as a research activity in visual arts is “an inquiry process that is directed by personal interest and creative insight, yet is informed by discipline knowledge and research expertise” (Sullivan 2005, pp. 100-1). In this research, I consider my personal interest in the creative production and use the knowledge and expertise in the animation discipline to achieve the excellence of the project. I am also consciously aware of myself as both researcher and respondent and as the one coming to developing artistic perspective within the processes of the research.

Reflexivity is an overarching notion that can be applied to researchers who are also practitioners. The activity of reflection-in-action in Schön’s (1983) proposition of reflective practitioner has the characteristic of reflexivity. He considered that the knowledge of a practitioner is usually intuitive and tacit. The skilful practice of professional practitioner is very similar to spontaneous actions in our everyday life. Reflection-in-action is essential for reflective practitioners to
obtain professional knowledge through their practices. Peter Jarvis (1999) further argued that a reflective practitioner is actually a practitioner-researcher who conducts an individual and subjective research on his/her own practice. In this project, I also considered myself to be a practitioner-researcher consciously reflecting throughout the whole production practice.

McNiff (1998) also warned that the one-sided subjectivity is dangerous for art-based research because of its limitation to personal experience. He stated:

*The most difficult challenge for art-based research is the avoidance of the quagmires of personal experience. Introspection must find ways to work collaboratively with empirical data and make useful connections to things beyond itself. In my experience it has been the objective presence of the art object and the physical process of art making, together with an over-riding commitment to inquiries which are useful to others, which have helped to check excessive self-immersion (McNiff 1998, p. 60)*

The connection and collaboration of introspection with empirical data is the key to making this research go beyond the artwork itself, and to avoid pitfalls of one-sided subjectivity. I use three approaches to avoid the possible pitfalls. Firstly, I continued to record my technical processes and results throughout the trial-and-error process of my art’s creation. Multiple versions of images and preliminary tests were kept during my practice. Secondly, I reflected on key principles derived from my practice and made connection to the usefulness, not only for my future practice, but also for other artists or animators. Thirdly, I submitted my animation project to animation/film festivals as an objective presence of the art object.

### 2.3 Toward a research model for production practice

Methodological models have been proposed to theorizing research in relation to the practice of art and design. Models proposed for design projects (Noble & Bestley 2005, p. 47) usually emphasize the solving of specific problems in a graphic design project. Gillian Rose (2007) proposed a methodological approach for the interpretation of visual materials. The model comprised of three parts of sites: production, image itself and audiencing. The ‘site of production’ consists of technological aspects. How art works are made is the major concern in this site. The ‘site of image itself’ includes a wide range of aspects from the content and meaning of images to elements such as colour or light in the composition of images. The ‘site of audiencing’ includes social, economic and political relations between images and audience. The boundary between each site is not absolute. For example, psychoanalytical and semiological analysis are in both the site of image itself and the site of audiencing. This model is useful for analysing and interpreting visual materials in any form, from painting to moving images. However, Rose's model uses an analytical approach to interpret and analyse existing art works within a broad range, including those
works that are underpinned by social and political issues. I approach my research from an artist's or practitioner's perspective, and explore how theoretical frameworks inform moving image productions. The relationship between audiences and artworks in social and political contexts is beyond the scope of this research.

Sullivan (2005) proposed a framework centred on art practice to theorize visual art research. He claimed that “visual art can be seen to be a form of inquiry that is sound in theory, robust in method, and capable of generating important creative and critical outcomes” (pp. 224-5). A flexible model was built to theorize visual art research through practice and underpin the argument that art practice is a form of research. A wide range is covered in this framework such as methodological approach, criticism in cultural context and narrative discourse. I admire the ambition of this attempt to establish a framework for the research in visual art within such a broad scope, and agree that art practice can be seen as the centre of a research. Nevertheless, within the scope of my research, my intention is to consider the theories regarding research activities centred on the practice of moving image production.

In the discussion of methodological approaches in the framework of art-based research, McNiff (1998) stated:

*Theoretical explanation, practical application and comparisons to the work of others, will emerge naturally from the experimental work in the studio* (p. 147).

Theoretical explanation, practical application and comparison to the work of others are three major activities in art-based research. As for a practitioner-researcher, research approaches are similar to the research activities in art-based research. These approaches are highlighted and described for reflective practitioner to engage in research (Jarvis 1999, p. 71). *Repertoire-building research* accumulates and describes useful examples of reflection-in-action by primarily using case studies. This research activity is basically the comparison of the work to the work of others. Research on fundamental methods of inquiry and overarching theories is an activity in search of theoretical explanation. Research on the process of reflection-in-action (in practices) describes the activity of practical application.

Producing a film or animation as a main project of research has special concerns. Firstly, the production time is usually longer, and the production process more complicated, than those in fine arts such painting or ceramic. The production of animation is especially time-consuming. The extreme example is *The Passenger* (2006), a single project of 3D computer animated short seven minutes in length. It was produced by Chris Jones over a period as long as eight years (Jones 2006). I therefore suggest that to concentrate on one project of film/animation is reasonable for
Methodology

research based on moving image.

Secondly, research on moving images production usually involves multidisciplinary fields including narrative concept, ways of representing ideas and production techniques. To organize such a broad range of research topics, one needs a considered approach. I suggest that organization can be based on the content of a film, aesthetics to represent the idea and technical issues. Through the combination of methodological notions in art-based research and practitioner-researcher discussed in previous section, I propose a methodological model to organize multidisciplinary materials for a research that centres on a moving images production practice:

![A research model for production practice](image)

**Figure 4 A research model for production practice**

In this model, content, aesthetics and process are three essential elements for research upon production practice. The three subsidiary research questions underpinning my major production problem addressed in Chapter 1 are framed to make inquiries regarding the content, the aesthetics and process aspects. The three aspects are overlapped and interrelated as the diagram indicates. Furthermore, derived from the concept of art-based research (McNiff 1998), theoretical explanation, practical application and comparison to the work of others, are three major activities used to answer the questions framed in this model. The three activities are discussed later in this section.

The content, aesthetics and process in the centre of this model can also be extended to organize the
multidisciplinary fields for research that is centred on the practice of moving image production. I organized the fields and topics for my research in the following diagram:

![Diagram](image)

**Figure 5** Use the research model to organize fields of study

The grey ovals extended from content, aesthetics and process are fields and special topics that are discussed in this exegesis. This flexible model is derived from the notion of mind mapping which visualizes conceptual ideas (Gray & Malins 2004, pp. 107-8). This also fits within the constructionist paradigm in which the knowledge is constructed. The links between circles of fields or specific notions indicate the interrelation of them.

This exegesis is thus structured as the content, aesthetics and process aspects of animation production, with multiple extended areas as shown in Figure 5 through which the three research activities will seek to answer the research questions.

**2.3.1 Theoretical explanation**

The theoretical explanation is used to explore the theories in relation to production practice and to contextualise my animated artwork into existing aesthetic concepts. Reviewing the textual
Methodology

materials is a basic activity for most of the research. The term ‘literature review’ is defined as “a systematic, explicit, and reproducible method for identifying, evaluating and synthesizing the existing body of completed and recorded work produced by researchers, scholars and practitioners” (Fink 2005, p. 3). Since my research is centred on the practice of a creative production, the reviewing needs to include not only literature, but also other animated art works. Interdisciplinary documentation and visual materials are reviewed in relation to the content, aesthetical and technical aspects as demonstrated in the model proposed in previous section (Figure 4). In the discussion of literature review in art-based research, McNiff (1998, p. 155) suggested:

...locating a comprehensive literature review at the beginning of research project can sometimes restrict the process of creative discovery. It is also possible that the academic tone projected by a literature review may restrict a more creative use of language in an art-based study.

I reviewed textual and visual materials in parallel with my practice during my animation project and after the project was completed. The reviewing of visual materials of other animations often inspires me with ideas for creative production. Textual reviewing helps critical thinking but seldom inspires production. The connection of the reviewed texts and visual materials with my practice was conducted after the project was completed.

2.3.2 Comparison to the work of others

To locate my own practice within a broader aesthetic context, and to support the theoretical explanation, I used the research method of comparing my work to the work of others. I also compared and referenced other artworks throughout the production phase for the creation of unique visual styles. Visual referencing is further discussed in Chapter 4.

I use a case study in Chapter 3 for comparison to the work of others and to investigate the issues regarding the dream-like quality in a specifically selected animation for comparison with my work. The case study is one important methodological approach in social science research. There is no definition of a case study that has gained universal agreement (Jarvis 1999, p. 76). A case is “a single instance or example of something” (Gray & Malins 2004, p. 117). Blaikie (2000, p. 215) quoted Goode and Hatt’s (1952) definition of case study as “a mode of organizing data in terms of some chosen unit, such as the individual life history, the history of a group, or some delimited social process”. Jarvis (1999, p. 77) defined case studies as "both the process of learning and research about the specific phenomenon or phenomena under investigation and about the product of that learning and research”. The specific phenomenon refers to a specific
case. He further claimed that, “case studies are conducted primarily by practitioner-researchers
in relation to their own practice”. The case study and comparisons to other artworks also helped
to locate my animation within a broader cultural and aesthetic context.

2.3.3 Practical application

Scrivener (2000) has identified two major types of practice-based doctoral research project. One
is called the problem-solving project and the other is the creative-production project. In problem-
solving project, researcher set ups a purpose or identifies a design problem to solve. The Artifact
is a demonstration of the solving of the problem, and the knowledge gained from the problem-
solving is transferable. In a creative-production project, the researcher produces an Artifact in
relation to a cultural issue or personal interest. The Artifact contributes to human experience
instead of the body of knowledge. The norms of problem-solving and creative-production are
listed below.

Table 1  The norm of problem-solving project in practice-based research derived from
Scrivener (2000)

<table>
<thead>
<tr>
<th>Problem-solving project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Artifact is produced</td>
</tr>
<tr>
<td>Artifact is new or improved</td>
</tr>
<tr>
<td>Artifact is the solution to a known problem</td>
</tr>
<tr>
<td>Artifact demonstrates a solution of problem</td>
</tr>
<tr>
<td>The problem recognized as such by others</td>
</tr>
<tr>
<td>Artifact (solution) is useful</td>
</tr>
<tr>
<td>Knowledge reified in artifact can be described</td>
</tr>
<tr>
<td>This knowledge is widely applicable and widely transferable</td>
</tr>
<tr>
<td>Knowledge reified in the Artifact is more important than the Artifact</td>
</tr>
</tbody>
</table>

Table 2  The norm of creative-production project in practice-based research derived
from Scrivener (2000)

<table>
<thead>
<tr>
<th>Creative-production project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Artifacts are produced</td>
</tr>
<tr>
<td>Artifacts are original in a cultural context</td>
</tr>
<tr>
<td>Artifacts are a response to issues, concerns and interests</td>
</tr>
<tr>
<td>Artifacts manifests these issues, concerns and interests</td>
</tr>
<tr>
<td>The issues concerns and interests reflect cultural preoccupations</td>
</tr>
<tr>
<td>Artifacts contribute to human experience</td>
</tr>
<tr>
<td>Artifacts are more important than any knowledge embodied in them</td>
</tr>
</tbody>
</table>
My project has characteristics of both the creative-production and problem-solving types of research project. In a broad view, my animation is a creative-production project. The story idea originated from my personal interest and the 2D graphical styles that I chose for the animation also emerged from my personal artistic instinct and professional experience. However, the production of a 2D graphical style in 3D computer environment also presents a major technical problem in both industry and academia (discussed in section 3.3.3). In the production of each section of the story, I set up an initial goal of a specific visual look in order to develop specific visual styles. I did this by referencing a pre-selected traditional 2D hand-drawn animation, or certain visual styles such as watercolour painting. The way I overcame the technical issues fits into the problem-solving norms described by Scrivener (2000). Strategies and ideas are generated from the problem-solving processes through reflection and reflexivity. The strategies and ideas used to achieve specific visual styles are transferable to my future practice and to other animators/artists who intend to create similar visual styles. Thus my research contributes to human experience as a creative-production project, and at the same time contributes to the body of knowledge by providing strategies and ideas that may be used to solve design problems.

For the problem-solving aspect, I use an action cycle to achieve desirable images and to generate knowledge in the animation production. Jarvis (1999) suggested that a reflective practitioner conducts reflective planning, reflection-in-action and retrospective reflection upon practices before, during and after actions of practice. I apply the following action cycle to reflect my practice:

![Figure 6 An action cycle of practice with reflection](image)

Figure 6  An action cycle of practice with reflection
The cycle starts at the reflective planning stage with pre-selected visual references such as specific 2D animation style. It is followed by the trail-and-error experiment and evaluation. If the desirable result is not reached, the cycle continues. When the desired result is achieved, retrospective reflection on the practice experience generates strategies for future application. Recording reflection during practices of action cycles is essential to research. My reflective journal was the major method I used to record my reflections, and is discussed in the next section.

2.4 Methods

I use specific methods to record the reflections on my practice, to analyse works of others, to present conceptual ideas and to produce my art works.

2.4.1 Reflective journal

The reflective journal is a major method used to record reflections and thought in this research. The reflective journal is “a purposeful process and framework for helping to expose and explore various models of practice, encourage interdisciplinarity and collaboration, extend professionalism and have more effective conversations with ourselves” (Gray & Malins 2004, p. 113). Scrivener (2000) suggested that the problem-solving project and creative-production project can be recorded in different manners. A record of reflection for a problem-solving project focuses on the reusable ‘know-how’ of the solution for the problem but not on the problem solving process itself. The recording of reflection for creative-production project, on the other hand, focuses on subjective issues and concerns of human experience. As discussed in previous section, my project has both creative-production and problem-solving characteristics. I recorded my personal concerns for the animation production and the technical solutions for each preset visual goal.

The reflective journal functions in my research in the following ways:

1. Taking notes while reading related documents.
2. Recording thoughts while viewing visual materials.
3. Developing ideas and concepts for the narrative of animation project
4. Quick sketching ideas for visual elements such as characters or environments for the animation project.
5. Recording technical problems during production of the animation project and documenting solutions of problems.

Examples of my reflective journal are presented in Appendix C.

2.4.2 Observation

I apply observation to achieve desirable visual results in the action cycle (Figure 6) and to analyse other artworks in reviewing and the case study. Observation is “to watch something/someone/ an environment/situation closely and accurately record in some way the activities/situation in order to capture data relevant to the research project issues” (Gray & Malins 2004, p. 106). Observation, marked as ‘the good eye’ by Rose (2007), is essential in the analysis of any work of art. This analysis includes the visual components of an artwork, the meanings expressed through the artwork and the techniques used to make the art work.

2.4.3 Visualization

I use visualization as a method to present conceptual ideas with diagramatic forms such as the model I proposed in section 2.3. Visualization is a method for “making visible ideas through a range of techniques in order to explore research project issues and/or present research findings” (Gray & Malins 2004, p. 107).

2.4.4 Production techniques

Production techniques were used to produce the animation project: Sophie’s Secret. A variety of techniques and skills were used in the animation production. They range from hand drawn sketching to the application of computer graphic programs. These production techniques can also be seen as methods to generate data in this research. They are discussed in Chapter 4 and Chapter 5.
Chapter 3

Content as a dream-inspired story

In this chapter, I start with a review of theories including psychoanalytical and biological studies on dreaming. I then discuss the relationship between dreams and moving images to seek notions that will inform my production. Finally, I link the dreaming to narrative structures that significantly influence the storytelling in my project and other animation productions.

3.1 The nature of dreaming

In general, dreaming is “the images and thoughts that are experienced during sleep” (Gregory 2004). From the current scientific point of view, the human mental status is described as a continuum from focused waking thought to dreaming (Hartmann 2007) as shown in the following diagram:

![Figure 7 A Continuum of Mental Functioning by Hartmann (2007)](image)

Dreaming is the loosest mind status, represented at the far right of this continuum and inevitably overlaps a part of the day-dreaming section. This is what I will refer to as ‘dreaming’ and ‘dream’ in the discussion.

Established by Sigmund Freud in early 20th century, psychoanalysis is probably the earliest theory that utilized the analysis of dream content for the therapeutic purposes of exploring and resolving unconscious conflicts (Coon 1998). In *The Interpretation of Dreams* (Freud 1976/1900), Freud refers to dreams as “the royal road to the unconscious”. One fundamental assumption in psychoanalysis is that dreams reveal unconscious information, which is repressed during our daily lives. Dreams can be interpreted to solve any inner conflicts that are buried in our unconscious. The images of dreams, the ‘manifest content’, are transformations of the
hidden wishes in our unconscious. Freud called this, ‘latent content’. He believed that the process of dreaming, the ‘dream work’, is to disguise our hidden wishes in images we experience in dreams. Our current dreams ‘hidden wishes’ can be traced all the way back to our childhood. Following Freud’s theory, Jung (2002/1974) also considered that dreams are important messages from the unconscious. Jung claimed that dreams are not simply the fulfilment of repressed wishes, as was Freud’s view. Dreams also reflect the truth or reality of individuals and even extend beyond individuals’ psyches to the world of the collective unconscious (Snowden 2006). Collective unconscious is “…aspect of the unconscious shared by all…this was assumed by Jung to be inherited and transpersonal and, in his conceptualization, to consist of the residue of the evolution of our species” (Reber & Reber 2001). The notion of collective unconscious can be further linked to myth, which is discussed in a later section.

Both Freud and Jung emphasized the importance of symbols for the analysis of dreams but their approaches were different. Freud believed that symbols have global meanings and can be interpreted individually to reveal the ‘latent content’ underneath the ‘manifest content’. Freud believed that the understanding of ‘latent’ dream thought is the key to read the unconscious. However, Jung stressed that the interpretation of symbols needs to be put in the context of the individual’s life and the society within which he or she lives. He believed that there are multiple meanings for a symbol (Snowden 2006). The notion regarding symbol and symbolization significantly informs the storytelling in moving images as it does in my animation project. Symbolization in moving images is discussed in the next section.

The biological study of dreaming reveals measurable facts about dreaming in relation to activities in our brains. Such study began in 1953 when scholars discovered the cycles of human sleep (Winson 1990). In brief, we go through four to five cycles of sleep at night, these cycles consisting of two basic types of sleep (Gregory 2004). One is called rapid eye movement (REM) sleep and the other is non-rapid eye movement (NREM) sleep. More dreams were reported in REM period and the contents in this period of dreams are more dramatic or bizarre. Fewer dreams, with simpler content, were reported in NREM periods of sleep.

Although psychoanalytical and scientific based research about dreaming have formed very different grounds for explanation of the nature of dreams, I intend to identify characteristics about dreams and dreaming in both fields. Biological studies have formed more testable accounts regarding what dreaming is, and have pushed the psychoanalytical explanation to a metaphysical level. On the other hand, scientific studies seldom provide answers for the ‘why’ questions in the way that psychoanalytical studies do. I have identified, within both psychoanalytic and scientific studies, two overarching characteristics within the state of dreaming: emotions and bizarreness. These
two characteristics can also be found in films and animations that present a dream-like quality, as I will discuss later in this chapter.

Emotion has been broadly considered as a basic driving force for dream content in both psychoanalysis and scientific research. Over several decades, Hobson and his dream studies team collected dream reports from various resources, including sleep laboratories, and established an hypothesis called activation-synthesis theory (Hobson & McCarley 1977). They concentrated on brain activations and chemical environment during sleep in relation to dream content. Hobson claimed that dreams are random signals produced by brain activities during sleep, that they are possibly meaningless and that psychoanalytical interpretations are not supported by scientific evidence (2005). However, the importance of emotion in dreaming is the only point on which he agreed with Freud:

...we see that Freud was correct in his basic assumption that dreams are (in part) driven by instinctive force (emotions) and that these emotions are loosely connected to mental content (p.132).

Emotion being a driving force of the dream content is also significant in Hartmann’s Contemporary theory of dreaming (1998). The basic idea in the theory is that in dreaming, the neural system in our brain makes connections more broadly and more loosely than in waking. This process, which he referred as hyperconnective process, is not random but is guided by emotions. The major function of dreaming is the contextualization of emotions. In dreaming, our brains seek to connect experiences in our memories with similar emotions we encounter in our daily lives. Although we do not experience strong emotion in every dream, the dreams that impress us most are often those in which we experience strong emotions.

Bizarreness is another characteristic in dream content. Although a statistical report indicates that such bizarreness in dreams does not happen as often as we believe (Barrett & McNamara 2007), the scenarios of strange dreams have the greatest impact on most people, and are often the most memorable. Psychoanalytical explanations about bizarreness usually contend that the ‘dream work’ disguises our hidden wishes through mechanisms such as symbolization and condensation. These mechanisms are discussed in the next section and are linked to art creation. In Hartmann’s theory based on scientific discovery, the hyperconnective process in dreaming explains the bizarreness of dream content. That is, it is not specifically the content, but rather how such content elements are connected, that creates bizarre scenarios. The loose mind status with broad connective activities in our brains creates the bizarre scenarios we seldom conceive of in our waking lives. The loose conscious state in dreaming also possibly contributes to the feeling of unfamiliarity and bizarreness. Hobson (2005) identified five cognitive features in
dreaming, especially in the period of REM sleep as described before:

1. Loss of awareness of self
2. Loss of orientational stability
3. Loss of directed thought
4. Reduction in logical reasoning
5. Poor memory both within and after the dream

In the case study of a feature length animation, *Millennium Actress* (2001), in section 3.4, I used these cognitive features to examine the protagonist character’s state of mind because some scenarios in this animation are similar to our sense of dreaming.

The strong emotional impact and bizarreness in some dreams are most likely the reasons that they inspire me, and many other artists, in our art creation. For example, David Lynch’s dream-inspired animated short, *Alphabet* (1968), presents a bizarre scenario where the images of abstract, symbolic figures giving birth to alphabet and live woman are mixed with sound effects of baby’s crying and the woman’s singing to express a mood of fearsomeness (Lynch 1997). In the next section, I will explore the relationship between dream and art creation, especially in moving images.

### 3.2 Dream and moving images

Dream has inspired many artists in their creation of artworks including painting, sculpture, architecture, music and filmmaking (Hartmann 1998). It is the area of filmmaking that I have concentrated on, exploring the relationship between the act of dreaming and animated moving images.

For Curry (1974), dreams and film have been connected in a philosophical point of view:

> In general our dreams simply seem more cinematic than our days...Dreams are characterized by spatial-temporal discontinuities that are very like cuts in a film (p. 83).

He related the dream and cinema for the discontinuity of time and space. Dream has also been related to some film directors for their imagery and storytelling (Pagel, Kwiatkowski & Broyles 1999). For example, Ingmar Bergman credited dreams as parts of the subject in film production, and Bergman, Fellini and Kurosawa produced films that are described as ‘dreamlike’. The main theme in Fellini's *8 1/2* (1963) is about a director’s retreat into his dreams to find inspirations for
his film productions. The scenes in this film present a bizarreness and discontinuity which are very similar to our experience in dreams. Kurusawa's *Dreams* (1990) includes stories base upon the director's actual dreams.

The notion of dream interpretation in psychoanalysis has profoundly influenced the field of film studies. The film industry has been analogised as a ‘dream factory’ (Powdermaker 1950) and films were analogised as dreams that were waiting to be interpreted (Metz 1982, p. 14). From 1960s to 1980s, not only Freudian psychoanalysis, but also theories developed by Jacques Lacan, a French psychoanalyst, were widely applied to film studies (McGowan & Kunkle 2004). These studies form a branch known as psychoanalytic film theory. Scholars in this branch such as Metz (1982) and Mulvey (1975) intended to establish a theory to explain how moving images influence spectators’ minds with notions informed by psychoanalysis. For example, spectators’ identification with characters in films is the major part of the process when they watch and engage with movies (Andrew 1984). This process is an invocation of the infantile ‘mirror stage’, which is a mental developmental stage at which an infant identifies his/her image in the mirror.

A number of scholars have studied film from the point of view of cognition and rejected the psychoanalytical approaches. Prominent cognitivists such as Bordwell (1996) and Carroll (1996) intended to reconstruct film studies in a more empirical, subject-oriented manner instead of establishing a theory to explain all aspects of film viewing through psychoanalytic film theory (Currie 2004). One basic assumption in cognitive theory is that we respond to cinema in the same that we respond to reality, so there is no need to be concerned about deep unconscious mind states such as the ‘mirror stage’, which are so important in psychoanalytic theory. In cognitive film theory, the feeling of empathy was positioned as central to the experience of film, not the notion of identification in the psychoanalytic paradigm.

Cognitive film theory seems to make more sense as an explanation of film viewing. However, in the context of filmmaking, Freudian psychoanalysis, especially the ‘dream work’ mechanism, informs film production significantly. Gabbard (2001, pp. 5-12) outlined methodologies that have employed psychoanalysis in film studies. Some methodologies are for the purpose of exploring the underlying cultural phenomena, while others are for the analysis of spectatorship as in psychoanalytic film theory. These methodologies fall outside the scope of this research. However, I focus on Gabbard’s first methodology, which is the application of Freud’s ‘dream work’ to convey meanings in moving images. Condensation and symbolization are the two major mechanisms of ‘dream work’. They are significant concepts applied in many film productions including my project.
Since the story of my animation is adapted from a dream, I focus on the interpretation of symbolic meanings underneath the original dream and modified story ideas. I draw on concepts in psychoanalysis developed by both Freud and Jung. I used Freud’s notion of ‘dream work’ such as symbolization and condensation to interpret the content of the dream. In some aspects, I am in favour of Jung’s point of view. Firstly, the interpretation needs to be placed in the social and cultural context of the individual’s life experience. Secondly, a single symbol can be interpreted in different ways beyond the Freudian interpretation, which is mostly related to sexuality. The purpose of interpretation is to discover the message from unconscious in the individual’s current life for the purpose of therapy. In the animation, I expressed my ideas through symbols, and at the same time used symbols to open the narrative to other interpretations that viewers may have, based on their life experiences.

3.2.1 Symbolization

Symbolization defined as a psychological term is “an unconscious idea (is) expressed in the form of a different idea, object, image or concept” (Colman 2006, p. 744). Freudian symbolism relates mostly to sexuality. For example, elongated objects such as sticks are symbols of male organ and hollow objects such as vessels are symbols of female sexuality (Robbins 2005). Sexual symbols are very often seen in paintings and sculptures (Adams 1993). However, Robbins (2005) suggests that symbols in dreams may have meaning beyond that of the sexual. Individual cultural experience also needs to be considered for interpretation. Thus, symbols in an artwork can convey multiple meanings according to both the artist’s and the viewer’s cultural experiences. Symbols are also often seen in films (Giannetti 2002) and animation (Wells 1998) to convey meanings in narrative. Halpern (2003) reviews examples in which popular symbols were applied in dream themes in cinema. For example, “mirrors reflect a repressed self-image” and “apples reveal innocence corrupted” (Halpern 2003).

In my animation project, I used symbols to convey meanings. The worm is possibly the most significant symbol in this animation. If Freudian psychoanalysis is applied, the worm could be interpreted as a phallic symbol because of its shape. In my wife’s original dream, it was a bug similar to a cockroach that penetrated her body. I changed it into a worm to make it visually stronger in the script. The process of penetration is likely viewed as a symbol of sexual behaviour. The feeling about the secret of the worm inside is possibly the anxiety or the confusion about sexual development, or the search of identity that can be dated back to life experiences in adolescence. The adolescence is a “culturally defined period during which we move from childhood to acceptance as an adult” (Coon 1998, p. 138). Moving from role confusion to role identity is an important achievement in adolescence (Sdorow 1998, pp. 132-3). Children’s values
mostly reflect their parents’, but adolescents’ values are influenced by both their parents and peers. The conflict between new developing values and old values tends to make adolescence an unstable period. Sexual development is also an important phase in adolescence, while adolescents frequently keep secrets from their parents (Frijns et al. 2005). Sexual behaviour and confusion in sexual development are likely to be issues that adolescents keep secret from their parents. The emotional issues related to identity development, and the sexual development of teenagers, are especially common adolescent problems in the relatively conservative eastern society where my wife and I grew up in 1980s. Communications are often compressed between adolescent and parents during the period of middle school and high school, due to the highly competitive pressure of education. Girls are also under pressure to succeed and to win. This provided the reason for my choice of a teenage girl to portray the protagonist in the animation.

However, according to Jungian interpretation, a symbol can be interpreted in different ways by placing it into the context of an individual’s life. The dream occurred in the third month after my wife and I moved to USA in November 2001. It can also be interpreted as an anxiety stemming from the change to a new environment, or even her new identity being developed in the new world. From this viewpoint, the worm is a symbol for the changes in life. Moreover, according to the Contemporary Theory of Dreaming proposed by Hartmann (1998), dreaming is a broad connection-making (hyperconnective) process guided by emotion in our neural system. The function of the process of making-connections is to contextualize the new emotion into our memory by integrating new experience into existing knowledge. From this point of view, the anxiety about the changes of life in USA or new identity was possibly connected to the similar anxiety in the experience of adolescence. At the end of the story, the worm changes into a butterfly. The metamorphosis is a metaphor of the changes during the adolescence period. Other symbolic meanings conveyed by visual elements and transition are discussed in Chapter 4 and 5, along with the aesthetic development and production processes for this animation project.

In the later phase of the story, Sophie realizes that everyone, including her parents – and even the dog – has worms inside them. Other than being regarded as a sexual symbol, the worm can also be a symbol of the true inner nature of individuals since everyone has a worm inside. The true inner nature can be vicious, as in the form of worm, or good, as in the form of butterfly. In the end of the story, combining all the symbolic meanings discussed above, Sophie overcomes her anxiety regarding her sexual development, establishes her role identity, accepts her true nature and starts her relationship with a boy.

Sophie’s parents are portrayed as pigs to symbolize parental neglect. They are not necessarily bad parents, but reflect stereotypical parents, especially in Eastern society. They care more about
academic performance than emotional issues. The pig figure also implies the communication problem between the teenage girl and her parents. I also use pig figures of parents as homage to one of my most respected animation directors, Miyazaki. In his work *Spirited Away* (2004), Chihiro, the protagonist girl, saw her parents transform into pigs after they ignored Chihiro’s warning and ate foods in the spirit world. The overt reason of parents’ turning into pigs is their punishment for eating the forbidden foods, which are set out for spiritual beings (Drazen 2003a, p. 278). The relationship of Chihiro and her parents also reflects and implies the problem in the contemporary Japanese society (Napier 2005, pp. 181-3), in which the relationship between parents and children is often psychologically remote with their only connection being materiality. From the beginning of the film to their transformation into pigs, the parents show their neglect. They are uncaring of Chihiro’s nervousness about the new house and the strange environment and arrogantly believe that money can solve any problem, from the arrangements of moving to new house, to eating foods in the spirit world without asking in advance. In Eastern culture, the pig is often a symbol of laziness, dullness and obsession with materiality. In this film, the pig may symbolize the unloving, unsupportive and materialistic types of parents. I used the pig parents in my animation as symbols of mental remoteness between Sophie and her parents to reflect the typical relationship between parents and adolescent children in Eastern society.

### 3.2.2 Condensation

Condensation, as a ‘dream work’ mechanism in psychoanalysis, is defined as “combining several people, objects, or events into a single dream image” (Coon 1998, p. G4). Condensation and displacement has been applied to traditional painting long before the history of psychoanalysis. The application in Christian art centuries ago was often a juxtaposition of visual elements from various times and spaces (Adams 1993, p. 122). Halpern (2003) discusses a wide range of aspects in regard to dream and film. She points out that in dream themes of movies, bodies and faces from different characters were often condensed together to form special meanings to the dreaming characters in movies. Wells (1998) has established a framework of animation theory in which many aspects such as narrative and aesthetics are discussed for animation as an art form. Condensation is one of the narrative strategies for storytelling in animation. It works in two different ways. One is to condense the time and space between shots and scenes as in other moving image formats. The other is to express a comic effect through the construction of visual and/or verbal elements. This is unique to the form of animation. I suggest that utilization of condensation in moving images can be framed on two levels. One is the imagery level, where visual elements such as face and body can be condensed together, which is similar to the example in painting. The other is the narrative level, where events happening in different times and spaces can be condensed together for story telling purposes. Some animations such as *Tale of Tales*
(1979) and Even in Dreams (2007) present a discontinuous, dream-like quality through the use of condensation.

In my animation project, condensation works on both the imagery level and the narrative level. On the imagery level, condensation is applied to combine visual elements. For example, pig and parents were condensed to convey a symbolic meaning as discussed earlier. In the scene of Sophie’s nightmare, her head is condensed to a worm to display the horrific images in her dream after she saw the worm piercing from her parents. On the narrative level, condensation is applied, for the purpose of the story, so as to connect events happening in different times and spaces.

3.3 Dream and narrative structure

Whether dreams have a narrative structure or not has been an extensive topic of research. Jung (2002/1974, pp. 82-3) claimed that many dreams have a dramatic structure with four phases. The first phase is the exposition, which consists of a spatial and temporal setting, the characters involved and the initial situation of the dreamer. The second phase is the development, in which the situation becomes complicated and tension is growing. The third phase of the dream brings culmination, where things change completely or a new situation emerges. The final phase is solution or result, the final situation or solution sought by the dreamer. This structure is similar to the classical three acts structure consisting of beginning, middle and end.

The three acts structure consisting of setup, confrontation and resolution is shown as the following figure:

![Three acts structure](image)

**Figure 8  Three acts structure**

The story structure in my animation fits in well with the three acts structure although I did not consciously plan this when I developed the story. In Sophie’s Secret, the setup stage can be seen to start with the girl walking on the street and her encounter with the worm. This stage ends with the worm penetrating the girl’s body. She walks away because of the dog’s bark. The
length of this part is about one minute and thirteen seconds, roughly 24% of the total length. The confrontation stage starts as she walking in the city with other people. She is struggling, fearful of other people’s gaze. She also goes through her parents’ neglect and discovers that her parents have worms inside them as well. This stage ends with her waking from the nightmare in which she transforms into a worm. The length of this part is about two minutes and twenty-seven seconds. It is roughly 48% of the total length of the animation. The last stage, resolution, starts with the girl being inspired by the worm in the apple. She realizes that everyone has a worm inside them. The length of this part till the end of the story is roughly one minute and twenty five seconds. It is about 28% of the total length. The length of each stage also basically matches the three stage structure as shown in Figure 8.

I further examined the relationship between dreams and narrative using recent research literature where the investigative approach was scientifically based. Kilroe (2000) explored the relationship of dream and textual narrative through the investigation of text dream reports. She drew on definitions of narrative from narratologists such as Toolan (1988) and Todorov (1969) to examine the proposition that dreams are narrative. The findings indicate that some dreams “conform to the general characterization of narrative as ‘the representation of ... events and situations in a time sequence’ (Prince 1982)”. They also fit in with Jung’s four phases with the beginning, middle and the end. On the other hand, other dream reports “seem to resemble snapshots more than stories”. She concludes that “dream texts will vary in their degree of narrativity, ranging from fragmentary snapshot to epic tale”. This conclusion implies that, although dream content is possibly a good resource for storytelling, elements derived from dreams need to be refined or sometimes reconstructed in order to tell a compelling story that will engage audiences.

In the animation project, I adapted and modified the story from the original dream to form a clear storyline. As explained in Chapter 1, my wife’s dream inspired me to write the script for a scriptwriting class in 2002. The original script is close to the dream described by my wife. I considered that the story in the original script would be confusing because the gaps in the story between each scene are considerable. I modified the original script into several versions and finally came up with a narrative that satisfied me. The original script and the final version of modified script are attached in Appendix A. The major modification is the ending of the story and an addition of a scene to show the protagonist dining with two pigs. The pig figure was used to express the symbolic layers of meaning that are discussed earlier in this chapter. The main challenge in the early stage of concept development was the determination of the ending. The original story is a horror tragedy, in which the girl ends up transforming into a worm. Since the idea of transforming and metamorphosis of main characters was used as an ending in my previous production, Outside In (2004), I wanted to have a more meaningful ending in Sophie’s Secret
project, rather than produce a standard horror tragedy with simple metamorphosis. Moreover, I also wanted to devise a more optimistic ending, because this is a story of a girl’s growth and improvement. An alternative ending is that the protagonist girl walks alongside a boy. The final shot reveals that both of them have worms inside their body. In March, 2007 I came up with an idea for the ending, in which the worm grows a pair of wings to become a butterfly and carries the girl away in the air. I was satisfied with this ending since it combined the original idea of metamorphosis and the alternative ending, in which the girl changes and grows from the situation of having a worm inside her. The change and growth is expressed through the symbol of metamorphosis. With this modification, I had moved the ending away from a horror tragedy.

I made some minor modifications in storyboarding stage for storytelling purpose. A dog was added in the first scene. It barks at the girl after the worm penetrates into her body. The dog’s bark works as a narrative device. It connects and transits the girl’s emotion from the shock of the worm’s penetration, to the embarrassment of her weird situation. It is an alert for the girl to cover the hole in her chest because other people may also have seen the penetration and the hole. On a symbolic level, it also draws attention to the girl’s growing self-consciousness in adolescence development.

Another modification is in the scene where the girl talks with the worm in her own room. According to the original dream, the setting is that the girl talks with the worm joyfully. However, in my animation, the attitude of the girl toward the worm is confused and repugnant at this stage. I changed the scene into her struggling to pull the worm out to show her inner conflict and ambivalence regarding her changed state of being. This added dramatic tension to my animation.

Dream can also be linked to the mythic story structure. Jung proposed that the collective unconscious revealed in dreams was represented as a form of myth by primitives across cultures. Clift and Clift (1989) suggested that dreams can be further understood through the ‘monomyth’ structure proposed by Campbell (1968). Influenced by Jung’s theory, Campbell analysed myths around the world and found a universal pattern that he called ‘monomyth’, and referred to as ‘the hero’s journey’. Although the existence of a universal pattern in myths can be seen as culturally specific, the ‘monomyth’ structure has had a great influence on screen writing for films (Vogler 1998) and storytelling in film productions such as Star Wars (Campbell, Cousineau & Brown 1990, pp. 180-1). The hero/heroine ‘stars’ in movies are usually the main attraction of audience. Characters are often central to stories in animations. The storyline in my animation project also partly fits into this structure. The basic diagram of ‘the hero’s journey’ derived from Vogler (1998) is shown in the following Figure 9:
Basically, the hero’s journey starts with separation, in which the hero leaves the world with which is familiar and moves to a mysterious realm. The hero then goes through the phases of descent and initiation, where the hero battles and suffers difficulties. The last phase is when the hero returns with rewards from the completion of the quest.

The storyline of my animation can be regarded as Sophie’s journey to greater awareness. The obstacle of her journey is her inner conflict rather than external difficulties. The event that triggers this journey is the penetration of her body by the worm. Considering the pattern of the hero’s journey displayed on Figure 9, Sophie shows her confusion when she first sights the worm. She expresses her curiosity and interest by bending her body down. This sequence is similar to the process from the refusal to acceptance in the first phase of the hero’s journey model. Mentors are not obviously seen in my animation. The worm seems to be the ordeal for Sophie but it turns out to be a helper at the end of the story. The tests and difficulties are mostly from her inner conflicts and imaginings so the return phase is also not obvious. The elixir is the beautiful butterfly that is transformed from the worm after she resolves her inner conflicts.

Although the same ‘monomyth’ pattern applies, the different gender of the hero/heroine results
Donaldson (1987) uses two contemporary textual examples of heroines to show how Campbell’s ‘monomyth’ structure differs in the personal transformation between the genders. Clifts (1989) describes this difference based on Donaldson’s proposition:

*It probably is also true that there is a generalized pattern, which might appropriately be called a ‘masculine’ journey, which moves from hubris to humility, and that there is another generalized pattern, which might appropriately be called a ‘feminine’ journey, which moves from humility to self-affirmation (p.34).*

Since the protagonist in my story is a girl, the story in my animation seems well fitted to the ‘feminine’ journey in which the heroine moves from humility or even the feeling of humiliation to self-affirmation. Sophie moves from the feeling of embarrassment about the secret worm inside her, to self-affirmation, by realizing that everyone could have a worm inside. There are two other animated short projects with dream-related content I have found also feature female protagonists. The dreamer in David Lynch’s *Alphabet* (1968) is a female. It is a horror tragedy that the protagonist girl is severely tortured by her nightmare about alphabet. It does not fit to the ‘monomyth’ structure nor ‘feminie’ journey. On the other hand, the light-hearted animation short *Even in Dreams* (2007) presents an anxiety of extramarital relations (or the desire of it) from a feminine point of view. More or less it fits to the ‘feminine’ journey where the female protagonist moves from solicitude to confirmation of her mind.

### 3.4 Millennium actress: a case study

*Millennium Actress* (2001) is a feature length Japanese animation directed by Satoshi Kon. The major intention in this case study is to show how the dream-related theories discussed in this chapter can be used to explain the dreamlike quality presented in this animation. I also intend to examine whether the notion of the ‘feminine journey’ can be applied in this animation as a comparison to my animation since the protagonists are female in both.

Satoshi Kon has been renowned for unique storytelling in animation since his debut feature length animated film, *Perfect Blue* (1997), was screened. The stories in his animations are “very different from most of conventional anime in which the narrative often fall into the science fiction, fantasy, or comic romance genres” (Napier 2006, p. 24). In Kon’s animations, the boundary between reality and characters’ fantasies is usually blurred and interwoven with the progress of the story. In his animations, scenes often jump in a dream-like way with changes in the characters’ states of mind, consciousness or memories. This is similar to the approach that I applied in my animated project. I considered *Millennium Actress* (2001) as a climax of this
style of storytelling among his works to date. In *Millennium Actress*, the story unfolded through the juxtaposition of characters’ consciousness and memory. Japanese history was ingeniously applied as backdrops for the story fragments where the protagonist actress plays roles in the historical scenes of these stories. The interrelations between the protagonist’s real life and the roles she plays in the historical scenes create an ambiguity between fantasy and the real in a coherent story with a visually dazzling style. The history in these story fragments played by the protagonist, spans roughly a thousand years, as the title implies.

### 3.4.1 Narrative

The story begins with the view of a planet and space station. A female astronaut, whom the viewer realizes later, is Chiyoko Fujiwara, is the protagonist actress. She is determined to step into a rocket and says that she has promised to go to find ‘him’, in spite of the pleas of a male astronaut that she stays. With the murmur of a male voice, the viewer realizes that images are in a TV screen watched by Genya Tachibana, a documentary filmmaker, who has an appointment to interview Fujiwara later. Although that seems to be merely a play in video, Fujiwara’s determination to find ‘him’ is the main theme in this story. Tachibana’s murmurs along with the male astronaut in the video, ‘I have a feeling with you’ we understand his adoration of Fujiwara and his willingness to help her in any circumstance.

Tachibana and his cameraman have come to interview Fujiwara, who used to be a prime star in the history of Ginei Studio. The story unfolds within the form of the interview. Before it starts, Tachibana hands a key to Fujiwara who says ‘it can open the most important thing’. The key operates as an important object to progress the story. The key is also a significant symbol, which is discussed later in this section.

Seven of Fujiwara’s flashbacks in the interview tell her story from the time she was born through her decision to pursue ‘him’ (a painter and a left-wing protester), to her endless journey of pursuit. The flashbacks usually start with a new period in her life and ends up with an important turning point cut back to the interview with the contemporary appearance of Fujiwara, Tachibana and the cameraman. For example, the second flashback starts with how she was discovered by a director of Ginei Studio. However, her conservative mother opposed the idea of her daughter becoming an actress. Surprisingly, Tachibana and his cameraman with contemporary costumes were included in historical scenes shooting their footage and this reminds the viewer that they are an audience looking into Fujiwara’s memory. Occasionally on the street, she encounters ‘him’, the protester, who is chased by a group of police led by a man with scar in his face. She lets him hide in the storage house of her family’s premises and develops a friendship with him.
He flees from the storage house the next day to avoid discovery by the police. He left a key, which he claimed to be able to open the most important thing, at the storage room. To return the key to ‘him’ is possibly considered as the major quest of Fujiwara within the ‘monomyth’ structure proposed by Joseph Campbell (1968). The ‘monomyth’ structure and the hero/heroine’s journey are discussed later in this section. In the last few shots of this flashback, she runs to the train station where the owner of the key is allegedly heading. However, she collapses after she is unable to catch the train. In the last shot of this flashback, Tachibana appears in the scene with the cameraman and comments that the chase and subsequent collapse of Fujiwara in the train station is a scene from her first movie. At this point, Fujiwara’s real life, her roles and Tachibana’s interview have started to blend together and give this anime a dream-like quality.

The subsequent flashback of Fujiwara shows her agreeing to play a role for Ginei Studio because the film would be shot in Manchuria, where she believes ‘him’ to be. She meets two other important characters: Junichi Ootaki, the director, and Eiko Shimao, an elder actress. The director, the elder actress and the scar faced policeman are three major characters who obstruct her from her pursuit. The scenes in her flashbacks cut back and forth from her real life to the roles that she acts in films. With the progress of story, more time settings and spaces in different period of Japanese history blend with her real life. Whatever she is: a warrior, geisha or student in the historical settings; the uppermost desire in her mind is to find ‘him’. ‘He’ can be her husband lord in the Warring States period of 15th to 16th century Japan, or a samurai in prison set against the backdrop of Japan’s Meiji Period at the turn of 20th century (‘Millennium actress: production notes’). Basically, the time periods appear chronologically from ancient to modern and finally towards futuristic. The same character shows up over and over with different roles in different historical periods. Tachibana always plays roles such as samurai or carter to help her. Eiko Shimao, the elder actress, and the scar faced police always try to stop her from getting close to ‘him’ in roles such as a madam of geishas and a government officer.

In the first historical scene, a mysterious old lady rolling a traditional textile wheel tricks her into drinking a bowl of tea that makes her suffer the torture of love forever. She speaks to Fujiwara, ‘I hate you and love you very much’. According to Satoshi Kon (‘Director Satoshi Kon Interview’), the lady rolling the wheel is a symbol of time. This old lady appears several times as an illusion and always makes Fujiwara panic. The various historical settings with the same characters connotes the notion of incarnation. Incarnation is a popular concept applied in anime (Drazen 2003b). In one scene Tachibana claims that this is a legend of Fujiwara in a love story that spans seven lives. The source is possibly a Chinese folktale in which a couple of celestials are banished to earth as human beings by the Lord of paradise. They spend seven lives before finally getting together and restoring their status as celestials back in paradise. This story is well
known by audiences in China and Japan.

Fujiwara married Junichi Ootaki, the director in Ginei Studio after the first time she lost the key in the studio. The story reaches its climax when a man with a scar in the real world happens to arrive with a letter from the protester. The letter indicates that he might still be in his native land, Hokkaido. A long montage sequence shows her journey to Hokkaido to find ‘him’. It shows her in many different time segments and spaces from all the previous flashbacks. The last few shots of this montage shows that the one she pursues has disappeared in the snow field of a painting with a futuristic setting – the one in which Fujiwara, as an astronaut, walked on a planet. She eventually fails to find the one she pursues. The futuristic setting is actually a scene in the last film she acted for Ginei Studio. Tachibana was one of the crew in the studio. He picked up the key that Fujiwara lost in the studio when an earthquake interrupted the filming of the last film. Another earthquake ends this interview. Fujiwara faints and is sent to hospital. On the way home after this interview, Tachibana says that he happened to be in the same location when the old policeman with a scar on his face came to Fujiwara with a letter. The policeman confesses to Tachibana that he killed ‘him’ after she ran away. So what Fujiwara has pursued is merely a shadow.

Tachibana and his cameraman come to visit Fujiwara in hospital. He sadly realizes that she will not be cured but she is comforted with the idea that she can keep pursue ‘him’ again. She then utters that it might not be important that she meet ‘him’, and rests in peace. The last scene shows the young Fujiwara on the launching rocket. She speaks to herself ‘Maybe what I actually like is myself in the state of the endless pursuit for him’.

Although the story does not progress linearly but appears in different fragments in her life with the blending of illusions and real events, the whole story of Millennium Actress (2001) is possibly considered as Fujiwara’s journey of her whole life. In comparing her story to the ‘monomyth’ structure proposed by Campbell (1968), we find that her journey consists of the first two phases in the structure: separation and initiation. The third phase, return of hero, is absent in Fujiwara’s journey. In the first phase, separation or departure, she has a quest, which is to return the key to the one she loves. The opportunity offered by the director of Ginei Studio might be considered to be her call to adventure. For the second phase, initiation, she crosses the threshold by accepting to play a role in Ginei Studio. She goes through tests, and encounters allies and enemies during her career in the studio. She meets the mentor, who is Tachibana. The major obstacles for her quest are from the director, the elder actress and the scar-faced policeman. The greatest ordeal that she confronts is possibly her travel to Hokkaido for the last hope that was brought from the scar-face policeman. From another point of view, her greatest ordeal might be her obsession with pursuing
‘him’. However she has never been rewarded, nor did she return with an elixir. Moreover, she has never conquered or defeated any enemies or her obsession. Rather, she accepts the obsession of her endless pursuit and love as she states at the end of the story. Based on the ‘monomyth’ structure, Donaldson (1987) demonstrated that in a ‘feminine journey’, the heroine moves from humility, or even self-denial to self-affirmation. In Fujiwara’s journey, she also moves from her obsession to acceptance and self-affirmation at the end of story.

### 3.4.2 Dream-like quality

Although the story of *Millennium Actress* (2001) is not based on any dream, Kon experimented with the ‘formula’ of dream in the production of this animation (‘Director Satoshi Kon Interview’). For example, in one scene Fujiwara argues with her mother about her unwillingness to accept any candidate for marriage. After several shots that cut back and forth between Fujiwara and her mother, Eiko Shimao, the elder actress is substituted for her mother in the same scene. The next few shots reveal that they are filming in studio. The displacement of people in a similar scenario is something that we often experience in dreaming. Displacement is one mechanism of ‘dream work’ in Freud’s theory.

Another of Freud’s mechanisms of ‘dream work’, symbolization, is applied in *Millennium Actress* to express specific meanings. According to Satoshi Kon himself, the mysterious old lady appearing in the first historical scene is a symbol of time (‘Director Satoshi Kon Interview’). Running is another significant symbolic expression of Fujiwara’s endless pursuit in this animation. Running sequences within various historical settings are usually used as transitions between two different historical scenes or end with her falling. This seems to imply that her pursuit is predestined to be unsuccessful. The key to be returned to ‘him’ is an ‘open-ended symbol’ (Napier 2006, p. 37), which is essential to the story. Literally, it is an object that Fujiwara wants to return to the man she loves. It also gives her the courage and motivation for her endless pursuit. She lost the key twice in her life. She married the director after the first time and she resigned and lived in obscurity after the second time. For Tachibana, the key provides him an excuse to get access to Fujiwara. It can also be seen as an object to open the memory of Fujiwara. However, according to Kon himself, ‘there is no one and only explanation. I would rather want my audience to enjoy their own interpretation’ (‘Director Satoshi Kon Interview’). This is very similar to my attitude for my own animation project. The symbols I chose are deliberately open to interpretation.

Condensation is a mechanism of Freud’s ‘dream work’ as well as a significant narrative device in animation as discussed earlier in this chapter. The condensation is applied in this animation as a narrative device. According to Satoshi Kon (‘Director Satoshi Kon Interview’), time is the
main theme in this animation. The condensation of time operates in two levels. On one level, Fujiwara’s life is condensed as one axis of the main plot of story. The past time in her life coexists in the present time of interview. On the other level, roughly a thousand years in Japanese history is condensed as a backdrop for the story. The status of protagonist as an actress within a background of film production legitimates the simultaneous existence of two timelines.

Repetition is another significant characteristic in this animation. Through the device of embedded narratives in the form of film roles, the same characters appear over and over again. Fujiwara is always the female protagonist who is in search of ‘him’. Tachibana always supports and helps her in what she intends to do. The scar faced policeman always blocks her pursuit of ‘him’ no matter what era and what role she plays in the operas. This repetition in the setting of character reduces the narrative complexity of the shift from different periods of history with different visual elements. Her strong will to find and get together with ‘him’ is central to the plots of all the historical, modern and futuristic scenes of the operas in which she acts. The simplicity and repetition in all these segments accumulate and strengthen the mood in this animation just like different movements in a symphony (Young 2007).

Moreover, the repetition is also presented within the structure of story. The story progresses with cutting back and forth between the interview room and Fujiwara’s flashbacks with various temporal settings. Sections that cut back to the interview room between Fujiwara’s flashbacks pull the viewer back to the reality of her life. These sections operate as a break from visual fantasies and also move the story forward. In these sections Fujiwara, with her contemporary appearance, often starts by speaking about events that are turning points in her life such as her decision to take a role in Ginei Studio, or the marriage in her present real life - these are critical events in the narrative.

With regard to the biological study of dreaming discussed in section 3.1, some cognitive features of dreaming in the period of REM sleep are identified by Hobson (2005). I intend to examine if these features can also be identified in this animation. The first feature is the loss of awareness of self. In the scene after Fujiwara claims that she lost her key somewhere in the studio, all the crew are helping to look for it. One crewmember asks with curiosity ‘why is the key so important?’ Many other crewmembers want to know as well. One of them says, ‘Sensei, I want to know’. ‘Sensei’ is a title used to address someone who is respected in his or her profession. The title is also used to address a teacher or doctor (Poitras 1999, p. 114). In the next scene, Fujiwara transforms into a teacher of secondary school and answers the question by addressing that the key belongs to a person who is important to her. This transformation is very similar to what often happens in dreams. Fujiwara is unaware that she has transformed into a teacher through the hint.
of the word ‘sensei’.

The second feature is the loss of orientational stability. Many transitions between scenes in the animation show this feature. For example, Fujiwara opens a door and the scene outside the door is another location. The third and fourth features are loss of directed thought, reduction in logical reasoning. They are associated to the first two features. She lost the directed thought and logical reasoning about herself and her location. The last feature, poor memory both within and after the dream, is not obviously presented in the animation since there is no actual dreaming in the animation. Thus no poor memory is presented within dream and after dream.

As discussed in section 3.1, one major concept in Hartmann’s (1998) theory is that dreaming is a broad connection-making (hyperconnective) process in the neural system of our brains. This process is not random but is guided by emotions. If we consider that all Fujiwara’s flashbacks are scenarios in a dream with the broad connection-making process, these segments are all centred on her strongest emotion, which is the desire to get together with ‘him’.

Bizarreness is another characteristic of dreaming content. The ways that images were created to represent the story probably contributes to the bizarreness of the dream-like quality in this animation. As the director Kon indicated, Millennium Actress was produced with the concept of trompe l’oeil. Trompe l’oeil is French term defined as ‘trick the eye’ in the art field (Delahunt 1996). It is usually used to describe the style of realistic paintings that create three-dimensional illusions as if they were in real world. In this animation, trompe l’oeil refers to the seamless juxtaposition of characters’ real life and their illusions. The animation is also described as a style of kaleidoscope (Young [羊廷牧] 2007) for the dazzling of various visual settings. The changing illusions and real events are unified in a story by the repetition of character settings as discussed earlier. All these visual elements create the bizarreness, which contributes to a dream-like quality in this anime.

Some unique transitions between scenes rely on the editing technique such as match on actions. The match on action is “a continuity cut that splices two different views of the same action together at the same moment in the movement, making it seem continue uninterrupted” (Bordwell & Thompson 2004, p. 503). In some scene transitions, the actions of characters seem continuous, even while the scenes change. For example, in a scene where Tachibana drags a rickshaw to carry Fujiwara, who is in geisha costume, he suddenly falls down and the rickshaw runs by itself. The next shot shows that Fujiwara, now in a more recent costume, is riding a bike down the hill. The strong actions of both the rickshaw and the bike connect two shots smoothly. Fujiwara’s running in a shot is often a preliminary notice of transitions of scenes. Running as a strong action is a
good occasion for *match of action* transition. For example, in a scene where Fujiwara is running with a ninja costume, she trips over an enemy ninja’s trap and is falling down. In the next shot she is down on the floor, wearing geisha clothing in another historical period. Another unique transition technique is that using a door to bridge two scenes with different historical settings. For example, Fujiwara on a costume of Meiji period opens and runs through a long tunnel. The next shot shows that she walks out from the tunnel with different costume from the world war period.

To summarize, the bizarreness, and the strong emotional impact in dreams, are the two characteristics that are most likely to inspire many art creations including the narrative in my animation. Freud’s ‘dream work’ mechanisms, such as condensation provide an explanation of the bizarreness. These mechanisms, especially symbolization, help to uncover the underneath meanings of moving images within cultural and social contexts. My animation expresses layers of meanings, and at the same time is open to other interpretations. Special cognitive features identified by biological studies of dreaming also contribute to the explanation of the bizarreness of dream-like quality. It is necessary to adapt and reconstruct the fragments of bizarre scenarios derived in dreams to form a story for effective communication. The story structure in my animation after the adaptation from the dream fits in classic structures such as the three acts structure and the ‘monomyth’ structure. Both the ‘dream work’ mechanisms and cognitive features are able to be identified in *Millennium Actress*, which I consider as an animation that well represents a dream-like quality. The rich visual settings and the simple narrative structure in *Millennium Actress* construct an animated story that is as bizarre as a dream, yet retains narrative consistency. In my production, I aim to tell a story with a simple structure and multiple visual styles to achieve a similar dream-like quality.
Chapter 4

Toward a hybrid aesthetic

In this chapter, I explore animation aesthetics in relation to the 2D graphical styles I use in my project, and discuss the development of the multiple visual styles to create a dream-like quality in my animation. I start with a review of the definitions and the scope of animation aesthetics, discuss the conceptual models of animation aesthetics and seek a location for the visual styles I create in my project. I then discuss significant aesthetic notions emerging in digital age and how they inform my production as a 3D computer animation. Finally, I discuss the development of the designs for characters and environments by referencing traditional 2D hand drawn animations and look into concepts ranging from film art to graphic design for the creation of hybrid aesthetics and dream-like quality in my animation production.

4.1 Definition and scope of animation aesthetics

“The word ‘aesthetics’ (from the Greek aisthanesthai, to perceive; aisthētica, things perceptible) was introduced into philosophical terminology about the middle of the eighteenth century…” (Saw & Osborne 1968, p. 15). The term ‘aesthetics’ is often interchangeable with ‘the philosophy of art’ (Iseminger 2004). It is an attempt to answer questions such as “what makes something ‘art’, and why should we value it?” (Graham 1997, p. 1). Aesthetics also refers to theories about the fundamental nature and value of art (Anderson 1998). The discussion of aesthetics is an enormous subject and there may be no single answer for what art is and what the value of art is. Animation is usually considered to be a media with a close relationship to cinema, or as part of cinema. In the discussion of general concept of art, animation aesthetics are often either discussed as a part of film art (Gaut 2004) or overlooked (Graham 1997).

The field of animation studies is a relatively new area, and has been emerging only over the past two decades. Furniss (1998) pointed that for a long time animation had not been considered as a ‘real’ art form. Animation was regarded as a highly commercial media that was oriented to attract young audiences and was not seriously considered as a research subject by scholars. Studies on animation aesthetics emerged in the late 1980s because of the rise of Media Studies as a discipline in its own right under the influence of post-modernism. The once neglected and marginalized media of entertainment started gaining the attention of academia. Some studies on animation focus on the history of animation in various countries (Bendazzi 1994; Maltin 1987), some focus on aesthetic development in a historical context (Klein 1993) and some concentrate on social and cultural issues in related to animation (Pilling 1997). In this research, I concentrate
on the aesthetics of animation and seek to place the visual styles I created in the animation project into the existing theoretical context.

Animation has been defined in different ways. The broadest definition of animation is the one by ASIFA (Association International du Film d'Animation): ‘not live-action’ (Denslow 1997). However, this definition is too vague and not workable. A more practical definition proposed by Charles Solomon (Furniss 1998, p. 5) is: “animation is produced by creating the illusion of movement frame by frame”. This definition stresses the essential characteristics in animation, which are the creation of the illusion of movement and the frame-by-frame process. The frame-by-frame process used to be the major characteristic to differentiate animation from live-action film. Nonetheless, the boundary became blurred after computer technology was brought into film production (Manovich 2001). Digital images created frame-by-frame in computers are now widely combined with live-action footage – these we usually call special effects. Special effects are beyond the scope of this research. However, in this digital age, the emerging aesthetic notions significantly inform my creation in the 3D computer animation project. These notions are discussed later in this chapter.

The illusion of movement is probably the most important aspect of animation aesthetics. Norman McLaren, a prominent animator in the National Film Board of Canada, emphasized the importance of movement in his famous elucidation of animation (Furniss 1998, p. 5):

> Animation is not the art of drawings that move but the art of movements that are drawn; what happens between each frame is much more important than what exists on each frame...

Disney Studio has established animation principles to train animators (Thomas, Johnston & Thomas 1995). Many text books provide techniques for animators to create motions of characters, objects and effects (Whitaker & Halas 1981; Williams 2001). These principles and techniques guide me to create movements in my animation project. The movement and animation principles are further discussed later in this chapter.

On a philosophical level, animation can be defined as giving life to once ‘inanimate’ objects. Animators in Zagreb Studio, former Yugoslavia defined animation to foreground its intrinsic nature (Holloway 1972, p. 9):

> To animate is “to give life and soul to a design, not through the copying but through the transformation of reality”.

Indeed, when we view animations, even though we know the imagery is not ‘reality’, we are
often entertained and touched by the humanity presented by characters to whom given ‘life’ and ‘soul’ have been. Moreover, in this definition, the ‘life’ and ‘soul’ is given to a design, which is the imagery transformed from reality through artists’ or animators’ aesthetic perspectives. That is, the transformation can be varied with artists’ aesthetic choices and ways of representation to create visual styles. In this animation, I concentrate on in this animation project is the creation of the ‘design’, or visual styles. In the next section, I explore the categories of animation and the theoretical spectrum of animation aesthetics.

4.2 Animation aesthetics models

In this section, I intend to explore the existing models of animation aesthetics and place the visual approach in my animated work into this context.

Visual styles of animations are highly associated with the techniques applied in the productions. Methods of productions need to be considered when we discuss visual styles in animations (Wells 2002, p. 15). For example, stop-motion animation such as *Wallace & Gromit in the Curse of the Were-Rabbit* (2005) has intrinsic differences of visual appearance from 2D hand drawn animation such as *The Lion King* (1994). The dimensionality in the images of stop-motion animation is very easily differentiated from the graphical flatness of hand drawn animation on first viewing.

Animations can be categorized by the techniques used of productions. The following categorization includes the most common and popular types of animations (Laybourne 1998):

1. Cut-out animation; for example: *Tale of Tales* (1979)
2. Time lapse and pixilation; for example: *Neighbors* (1952)
3. Kinestasis and collage; for example: *Cosmic Zoom* (1968)
4. Sand and paint-on-glass animation; for example *Street* (1976)
5. Stop-motion animation; for example; *Wallace and Gromit in the Curse of the Were-Rabbit* (2005)
6. Line and cel animation; for example: *The Lion King* (1994)
7. 3D (computer) animation; for example: *Finding Nemo* (2003).

The technical categories of animation are likely to be oversimplified and cannot include all animation types. Firstly, independent animators keep experimenting with new techniques to create new visual styles. For example, the tedious ‘pinscreen’ technique was used to produce
Toward a hybrid aesthetic

*Mindscape* (1976) in the National Film Board of Canada. Secondly, animators and animation companies sometimes combine two or more techniques in their productions. For example, some animations produced in Japan such as *Spirited Away* (2004) used hand drawn characters and backgrounds created by 3D computer software. Moreover, the emerging computer tools and new broadcasting platforms such as the Internet also encourage new types of animation. For example, animations produced with the computer program Adobe Flash, are widely distributed on the Internet, and Flash has been used to create animation for television, such as *Foster’s Home for Imaginary Friends* (2004).

My animation project is a 3D (computer) animation with 2D graphical styles, in which I experimented with visual styles by referencing traditional animations. Most of the animations I chose to reference in this project are in the group of line and cel animation, although some are in the sand and paint-on-glass animation category. 2D line and cel animation used to be a dominant format for feature length animation before the popularity of 3D computer animation. It is still the most popular format in TV animation production. In the traditional production of 2D animation, animators drew lines and shapes on transparent sheets of celluloid to create the illusion of movement. Sand and paint-on-glass animations are mostly developed by independent filmmakers such as Caroline Leaf (Laybourne 1998, p. 142). Animators place sand or paint on a piece of glass and manipulate them to create a special artistic look with a great fluidity.

If the production techniques are disregarded, animations can be placed in a continuum with live-action film according to their aesthetic tendencies. A continuum model proposed by Furniss (1998) is displayed in the following figure:

![Figure 10](image)

**Figure 10** A continuum model of aesthetic for animation aesthetic by Furniss (1998)

This model has two tendencies of aesthetics. ‘Mimesis’ suggests the intention to reproduce the reality while ‘abstraction’ indicates the use of pure geometric forms. Live-action films are located on the side of mimesis since they are recorded from real world. Animations are placed on the side of abstraction because they are fictional images created by artists. Films that combined animation and live-action footage such as *The Three Caballeros* (1944) are placed in the middle
of the continuum.

This model provides general aesthetic tendencies for traditional animations, but has limitations if we consider the recent development of 3D computer animation and special effects. As discussed earlier, the boundary between live-action film and animation is blurred because of the integration of computer-generated images into live-action film in recent years. The middle area in this model seems to be considerably expanded. For example, in *Sin City* (2005), live actors were filmed and placed in an entirely computer generated background. A different approach was employed in a French film *Immortel ad Vitam* (2004), in which backgrounds were recorded and some computer-generated characters performed with live actors. Moreover, the application of motion capture in 3D computer animations such as *Final Fantasy: the Spirit Within* (2001), and *Polar Express* (2004), make it even more difficult to locate these animations in the continuum.

I seek to locate my animation into this continuum. If the blurred area in the middle of this spectrum is excluded, most of the current feature-length 3D computer animations such as *Finding Nemo* (2003) are possibly positioned around the *Snow White* section of the continuum. My animation project, *Sophie’s Secret* tends toward the more abstract and is approximately at a position close to *Hen Hop* (1942), between *Snow White* and the level of extreme abstraction. In *Hen Hop*, images are graphically simplified with lines and colour, which is similar to my approach in the animation project. This is the zone on the continuum where the hybrid aesthetics in my project are located.

Another model of animation aesthetics is proposed by Wells (1998), in which characteristics regarding story, sound and visual styles are all considered to categorize animations:

<table>
<thead>
<tr>
<th>Orthodox animation</th>
<th>Developmental animation</th>
<th>Experimental animation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configuration</td>
<td></td>
<td>Abstraction</td>
</tr>
<tr>
<td>Unity of style</td>
<td></td>
<td>Multiple styles</td>
</tr>
<tr>
<td>Narrative form</td>
<td></td>
<td>Interpretive form</td>
</tr>
<tr>
<td>Evolution of content</td>
<td></td>
<td>Evolution of materiality</td>
</tr>
<tr>
<td>Specific continuity</td>
<td></td>
<td>Specific non-continuity</td>
</tr>
<tr>
<td>Dynamics of dialogue</td>
<td></td>
<td>Dynamics of musicality</td>
</tr>
<tr>
<td>Absent of artist</td>
<td></td>
<td>Presence of artist</td>
</tr>
</tbody>
</table>

*Figure 11* A model of animation aesthetics by Wells (1998)
According to Wells, there are basically three types of animation: orthodox, experimental and developmental animations. He asserted that all animation aesthetics need to be compared to the style established by Disney Studio, because this style has been the most widely distributed and accepted style in a long history, all over the world. The Disney style is described as ‘orthodox animation’. The other extreme type in this model is called ‘experimental animation’, which is similar to the tendency of abstraction in Furniss’ model. Animations that fall between the two poles are called ‘developmental animation’. In this model, characteristics are described to identify orthodox and experimental animations. Orthodox animation features ‘figures’ of human or animal characters in a consistent visual style. In contrast, experimental animation uses abstract shapes with multiple styles. In the aspect of the narrative, orthodox animation prioritises its content in a narrative form with a ‘specific continuity’. That is, orthodox animation tells stories with characters in a logical continuity. Also, the story in orthodox animation is mostly driven by character dialogue or other sounds that become the narrative clues. On the contrary, experimental animation prefers expression through ‘materiality’, or its pure form, in an illogical, non-linear fashion. Experimental animation rejects traditional story telling and concentrates on abstract visual elements without imperative functions or meaning. Visual elements such as colour and shape in experimental animation usually move with music. From the aspect of production process, orthodox animation is usually a collaborative work and shows the style of studio, while experimental animation is usually individual work and presents an artist’s version. In between these two contrasting types of animations, developmental animation is based on orthodox traditions but also seeks to reform these traditions through either form or content. Many developmental animations have some characteristics that are closer to orthodox principles, while others are more fitted to experimental principles. In many experimental animations and music videos, multiple visual styles with a ‘non-seamless’ aesthetic are often used to abstractly express special mood. However, using multiple visual styles to tell a narrative as in my project is not as often seen in animations produced in traditional techniques. One example is *A Little Routine* (1994), which was made in 2D hand drawn technique. In this animation, multiples visual styles were used to present the imaginative thoughts of a child in a conflict between him and his father before the bedtime. Another hand-drawn animation, *The Man with the Beautiful Eyes* (1999), also present a ‘non-seamless’ hybrid aesthetic to tell a story from a child’s point of view. In my project, I used multiple styles and a ‘non-seamless’ aesthetic to present a dream state.

Wells’ model was proposed before digital productions became widespread, so the new genre of digitally produced animations needs to be considered specifically. Wells, himself, contends that 3D computer animations, especially those produced by Pixar Studio, have possibly grown to be the new orthodox animation (Wells 2003). Beginning with *Toy Story* (1995), the full length 3D computer animations have gained increasing popularity over traditional line and cel animation.
Although it is not certain whether it is the new visual look, or the stories, that attract audiences from traditional cel and line animations, all characteristics of orthodox animation seem to well describe the current feature length 3D computer animations.

Characteristics of experimental animation and developmental animation are also seen in 3D computer animations. Independent artists such as Jim Ellis and Eric J. Heller coded computer algorithms to create non-figurative 3D shapes that move with music in their animations (Weishar 2004). Those animations can be categorized as experimental animation because their characteristics fit into the category. Some 3D computer animated shorts screened in film and animation festivals such as In the Rough (2004) and Birthday Boy (2004) follow the orthodox aesthetics. Others exhibit characteristics from both orthodox and experimental types and can be described as developmental. For example, Ryan (2004) is an animated documentary based on interviews with Ryan Larkin, who used to be a talented animator working in the National Film Board of Canada during late 1960s and early 1970s, but who lost his creativity through alcohol and drug addiction. In this animation, a narrative form evolves with content and dialogue but multiple visual styles are applied to characters in somewhat abstract ways.

My project can be seen as a developmental animation because some characteristics fit into the orthodox category, while others are closer to the experimental animations. Characters in my animation have solid figures and the story is based on a narrative structure with logical continuity. These are characteristics of orthodox animation. On the other hand, multiple visual styles are used to represent the discontinuous nature of dream, and the music is used to convey moods in the animation. These characteristics are located in experimental principles.

4.3 Aesthetics of 3D computer animation

Aesthetics of 3D computer animation is one of the central discussions in the emerging field of New Media (Burnett 2004; Darley 2000; Hiltzik 2004; Lister 2003; Manovich 2001; Sarafian 2003). Three overarching notions in New Media significantly inform my project as a 3D computer animation: realism, simulation and hybridity.

4.3.1 Realism

The creation of photo-realistic images by computer has been a long term goal of film industry and computer graphic research (Sarafian 2003), and the goal has nearly been achieved except for the realistic human face. The creations of realistic organic skin shading and fur, in the past, has greatly challenged the film industry (Crawford 2003; Schaffer 2004). However, the images in recent films with special effects such as The Lords of the Rings Trilogy (2001-2003) and King
Kong (2005) show that many of these problems have been solved. The progress of the calculation ability in computer hardware and advanced algorithms developed by computer scientists are the major factors that have overcome these challenges. The realistic human face is likely to remain a challenge to the achievement of photorealism. The creation of a realistic human face is possible only if we derive texture and geometry data directly from a real actor and digitally reconstruct them in the computer (Borshukov & Lewis 2005). In some 3D computer animations such as Final Fantasy: the Spirit with In (2001) and Beowulf (2007), digital artists in their production companies attempted to create human characters that were as realistic as possible. However, even unsophisticated audiences can tell that the characters are not real humans.

Realistic human characters could fall in the ‘uncanny valley’ and be disliked by audiences. The ‘uncanny valley’ concept was originally proposed by Masahiro Mori (1970) to explain why we feel uncomfortable about robots that look very similar to human beings, and it can be applied to human characters in 3D computer animations (McClean 2006; Weschler 2002). The discussion of ‘uncanny valley’ of pseudo-realistic human characters is beyond the scope of this research because my visual approach is removed from realism.

Story is still the central attraction for the audiences in 3D computer animation, rather than realistic appearance. In his discussion of Pixar’s digital aesthetics, Sarafian (2003) stated: “These films (Pixar’s animations) told stories; computer animation was the medium that expressed the message”. Realistic environments are built into these animations, but characters are stylised. Darley (1997) describes this visual style as a ‘second-order realism’, in which characters and objects appear to have volume in three dimensional spaces, yet they are not copies from real world. In my animation project, I created characters and environments away from realism by using 2D graphical styles. My intention was to create visual styles that are different from the mainstream. The production time and process were also reduced and simplified with 2D graphical styles, so I was able to focus on the story and character performance.

4.3.2 Simulation

Simulation of natural phenomena and the physical properties of materials is a special power of computer technology. Images of natural phenomena such as rain, fire and ocean can be easily created and simulated by 3D computer software. The power of simulation is not only used to create realistic images, but can also be applied to create visual styles that resemble certain traditional animation appearances. For example, the TV production South Park (1997-) is produced by 3D computer software with a visual style resembling cut-out animation. Solomon Grundy (2006) is a 3D computer short film, in which paper pop-up and puppet animation styles
Aesthetics are simulated. In my animation project, I intended to create images in 3D computer software to simulate selected 2D hand drawn styles. Simulation and visual referencing are further discussed in the next section and in Chapter 5.

4.3.3 Hybridity

The images created by 3D computer animation to simulate the traditional forms are actually hybrid styles. If we carefully inspect 3D computer animations that simulate other animation forms, we can still spot some subtle elements that are different from the forms they simulate. For example, in some scenes of South Park when characters move toward or away from cameras, the increasing and the decreasing of the characters size show a subtle dimensionality of the 3D spaces. The slight differences create a hybrid style between cut-out animation and 3D computer animation.

Hybridisation is a significant characteristic of images in the digital era (Crawford 2003) and it also significantly informs the creation of visual styles in my project. With the power of computer technology, digital filmmakers are able to produce moving images with the mixture of live-action footage, hand-drawn animated frames, digital still images and any other available source that can be converted to digital format (Lister 2003, p. 13). There are two levels of hybridisation. One occurs when traditional forms such as photography and cinema are transformed to new digital formats by the aid of computer technology (Darley 2000). The new digital formats allow more freedom of manipulation and further Hybridisation. The other occurs when previously separated media are merged to form ambiguous digital formats. Jirka (2004) suggests that the aesthetics in current mainstream 3D computer animations are hybridisations of Disney’s styles, live-action and 3D puppet animation. In some animations such as Ghost in Shell 2: Innocence (2004) and The Prince of Egypt (1998), hand-drawn characters were combined with computer-generated 3D backgrounds and special effects. In my project, I developed multiple visual styles with a hybridity of 2D hand drawn and 3D computer animation to represent the dream-like quality.

4.4 Visual references

In this animation project, I use line and cel animations as visual references to create hybrid visual styles between 2D and 3D. Visual referencing is often a preliminary procedure in the development of the visual concept for animation projects. Animations produced by UPA, and Japanese anime, were two major visual references for me in the early stage of visual development. This choice was possibly influenced by my experiences and cultural background. I grew up in Taiwan, which
is a land of mixed cultural influences. Chinese heritage is well preserved in Taiwan, since most of inhabitants came from China in various eras of the history. Japanese culture is also a significant influence because Taiwan used to be a colony of Japan from 1895 to 1945 (Davison 2008). Furthermore, the protection from USA after 1949, and the democracy experience in Taiwan, encouraged citizens to openly embrace western pop culture, especially that of the USA. Due to these cultural influences, I had abundant freedom to select and watch cartoons imported from both Japan and USA in my childhood, and I have appreciated both aesthetics since that time.

The approach I used to create visual styles by referencing the styles that had been established previously, is similar to the notion of ‘appropriation’, which is an approach of the fine art creation in 1980s’ postmodernism movement (Arnason & Kalb 2003). Appropriation is “an act of borrowing directly from the work of others” (p. 712). Artists with this approach often borrow images from different sources of media and mix them for new artistic creations. With appropriation, “by putting borrowed images into a new context-that is, by ‘recontextualising’ them – it also endows those images with a new and often unsettling impact that encourages viewers to see the original sources in a new light” (p.712). In this project, I referenced several sources of traditional animation, created images from 3D computer techniques and constructed them together for the storytelling. A new and unsettling hybrid aesthetic was thus created by the referencing and appropriation.

4.4.1 Reduction to simplicity in Gerald McBoing Boing

From late 1940s, UPA initiated a new aesthetic direction that was different from the dominant Disney style in animation production. Influenced by the early 20th century modern designs in illustrations and architectures, UPA’s artists developed visual styles by integrating the characteristics of abstraction and simplicity in modern design into their productions of animated shorts, to compete with Disney’s animations (Klein 1993; Moritz 1998). Different from Disney’s detailed and realistic-oriented approach, images in UPA’s animation are usually simplified and graphically stylised. The use of stylised visual elements in UPA was not only for artistic purposes, but also to save costs. With their relatively small budget, cost savings were imperative if they were to compete with other animation studios (Ford 1980). The concern to pursue artistry and efficiency at the same time significantly informs my animation production.

UPA’s aesthetic concept and production methods had a great influence on subsequent animation productions. The influence was in two different directions. On the one hand, their artistic innovation encouraged further diversification of visual styles in animation productions (Stephenson 1967), and this impacted not only on animation studios in USA but also on those
in Europe such as Zagreb School in Yugoslavia (Holloway 1972). On the other hand, their efficient production methods were applied and modified by other animation studios to produce so-called ‘limited animations’ with low budgets to accommodate the increasing demand for TV animations from mid-1960s (Furniss 1998). The limited animations were considered to be low-budget, poor quality and aimed only at children. This production method also influenced the early development of Japanese TV animation companies such as Mushi Production founded by Osamu Tezuka for cost-saving (Beck, Katzenberg & Plympton 2004, p. 238). It was not until late 1980s that TV animations such as *The Simpsons* (1989-) regained a wide popularity for both adults and children for their revolutionary content and visual styles.

The visual styles in UPA’s animations, especially *Gerald McBoing Boing* (1950), had a significant influence on my creation in this project. In *Gerald McBoing Boing*, visual elements are reduced to the minimal. Bill Hurtz, the animation’s designer, recalled the experience of working with the director, Robert (Bobe) Cannon. He says:

> We had a concept that the style really came out of the story, or out of the material. In GERALD MACBOING BOING, we were trying for absolute simplicity – how few lines could be in this picture? How elemental could it get? (Maltin 1987, p. 331)

The design of the characters and background is the contribution of reduction and simplicity in *Gerald McBoing Boing*. A screen shot of *Gerald McBoing Boing* is shown in the following figure:

![Figure 12 A still image in Gerald McBoing Boing](image)

Characters are portrayed with flat shapes and outlines without shading to create the illusion of volume. Environmental backgrounds are extremely simplified by removing lines that display perspective such as horizon or skyline. Spaces are suggested by objects such as a lamp, a sofa...
or a door within the frame of background. As Hurtz described, “There are no lines defining the
difference between the ceiling and a wall. A picture is on a space, and then there’s a rug. So
‘rug’ means there’s a floor and ‘picture’ means there’s a wall” (Maltin 1987, p. 331). I used 3D
computer tools to create a test animation clip, in which spaces are simplified like those in Gerald
McBoing Boing. The environmental setting was thus used in Scene Three of my animation. The
production process and techniques to create the scene are discussed in Chapter 5.

A special transition referred as ‘carry over dissolve’ (Frierson 2002) is employed between scenes
to connect them smoothly. For example, in one scene, Gerald stands on a stool in the kitchen
with his mother. All images fade out except for Gerald and the stool. The stool transforms into a
scooter with Gerald on it while the background of playground and other children fade in. Similar
dissolves between scenes are also applied in other UPA’s animations such as Rooty Toot Toot
(1951). I also experimented with special transitions between scenes, which I discuss later in this
chapter.

Reducing to visual simplicity as presented in Gerald McBoning Boing is considered to be a
significant notion that 3D computer artists can learn from 2D animations (Solomon 2005):

2D teaches reduction, and that’s what animation is really about, while 3D tends to be
more additive. It’s very easy to suggest tons of details. But for me, the fun is reducing
something down to its essentials: what makes a three-year-old girl cute, what makes a
monster scary (p. 14).

The notions of simplicity and reduction significantly influenced my creation in this animation
project.

4.4.2 Anime

Anime, or Japanese animation, is “one of the most explosive forms of visual culture to emerge
at the crossroads of trans-national cultural production in the last twenty-five years” (Brown
2006, p. 114). The popularity of anime is increasing in Western society for its distinctive aspects
ranging from narrative to visual styles (Napier 2005, p. 10). Anime has likely had a long lasting
influence on my creative vision since I had been watching Japanese animation on TV thirty years
ago when I was six.

Visual styles and conventions in anime significantly influence the design of characters and visual
experiments in my animation. Visual conventions are “not just limited to obvious cultural details
but are unique stylistic ways of communicating and expressing feelings and ideas” (Poitras 2001,
p. 59). Many conventions originally developed by artists for manga (Japanese comic book) were
applied to anime (Alzubaidy 2008). The reason is probably that many anime shows are adapted from popular manga. The most obvious anime convention regarding character design is the large eyes. I applied this convention on the character design, which is discussed in 4.4.3.

Another anime convention that influenced my production is the use of special objects such as flowers and sparkles to replace the characters’ backgrounds. This is done to express the characters’ emotions, especially the awakening of a love interest (Poitras 2001, pp. 62-3). These alternative backgrounds that consist of special objects, can also change drastically to demonstrate the sudden emotional change of a character for storytelling purposes. It is especially convenient in 2D cel and line animation among other traditional animated forms, because foreground characters and the background are usually drawn in different layers. These alternative backgrounds can be used with different characters when they have the same emotions.

Another visual convention in anime is using streaks in the same direction as the background to show the speed of a character. Streaks can also be drawn on the opposite side of the character’s moving direction to show the speed. In live-action footage, motion blur is a phenomenon where images of objects appear blurred when they are moving fast during the recording by a camera (Kerlow 2003, p. 257). Blur effects for fast-moving objects are added as a touch to enhance the realism in many 3D computer animations. In 2D cel and line animation, images are recorded statically frame-by-frame under the camera so blur effects of fast-moving objects do not appear. However, the speed is expressed though the lines on the opposite direction of the fast-moving object. This technique is called ‘dry brushes’ (Herbert 2004; Whitaker & Halas 1981, pp. 110-1). I applied 3D computer techniques to create these ‘dry brushes’ effects in the first two scenes of my animation.

The other visual conventions of anime, and where I experimented with 3D computer techniques to create these visual conventions, are discussed in section 5.3.

4.5 Design

In this section, I first discuss the basic visual elements in 2D graphical design since the 2D graphical appearance is the method I used to present the story in my animation. Following that, I discuss the design of characters and environments with the influence of visual references discussed in last section and other resources.

Design and art direction are essential in the pre-production phase to determine visual styles for animations in Hollywood studios and individual productions, including mine. Sketching is the major method I used to design characters and environments in this animation project. Other
than sketching, I used 3D computer programs to experiment with, design, the visual styles of environments for the scenes, because the visual results can be seen directly. The scene-based design process has enhanced flexibility, which is discussed in the next chapter.

4.5.1 Dot, line and shape

Dots, lines and shapes are three fundamental elements used to define objects in two dimensional images such as paintings (Lester 2003, p. 35). These three elements are interrelated. For example, dots can be aligned in directions to form lines and can be arrayed to form shapes of patterns (Pipes 2003, pp. 2-23).

Lines are especially essential in line and cel animation since they define characters and objects. Lines can be drawn in various qualities such as delicate and subtle, or bold and crude (Pipes 2003, p. 30) to express different feeling for viewers. In traditional line and cel animation, moving hold is a technique used to re-draw frames of a character when he/she is held in a pose, to keep the character from appearing completely static. This technique is usually applied to characters to show their ‘aliveness’ but is not used on the backgrounds. For example, in Les Tragedies Minuscule (1999), a French animation TV series, lines and shapes of characters keep shifting while backgrounds remain static. The strong movement of lines can also be used to accentuate the feeling of a character. For example, in The Big Snit (1985), the woman bursts out crying after her husband mocks her for her strange behaviour. Before she cries, the outlines of the woman shake violently to show her strong anger and sadness.

Shapes are essential to represent volumes of characters or objects. Lines can be cross-hatched to form the shapes or shades of objects. Shapes also have different qualities such as flat, shaded or textured.

In my animation project, I simulated hand-drawn lines and shapes in the 3D computer program. I experimented with the creation of lines and shapes with different qualities according to the mood in the scenes.

4.5.2 Colour

Colour theory is applied in the fields of art and design from fine art to architecture and interior design (Clifton-Mogg & Williams 2001; Pipes 2003; Rompilla 2005). Although people’s feelings toward colours are sometimes subjective and are dependent on their social and cultural background, there are principles that are universal and objective in the colour theory. Basically, colour has three characteristics: chroma, value and brightness (Lester 2003, p. 33). Chroma,
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or hue, is the name of the colour. Value, or saturation, refers to the concentration of the colour. Brightness, or luminance, indicates the relative lightness or darkness of the colour. Warm colours such as red or yellow appear to come forward in an image whereas cool colours appear to recede. Different colour schemes convey different moods (Pipes 2003). For example, a monochromatic colour scheme consists of one hue with various values and brightness levels, and this produces an elegant and soothing effect.

Colour design is equally important in animation production (Halas & Manvell 1976, pp. 84-6). Jules Engel, a colour designer in Disney Studio and UPA, suggested that colour has three functions in animation (Furniss 1998, p. 73). The first is to create space and depth. The second is to create visual effects for dramatic purpose. The third is to emit the feeling or mood of the story. Since the images in my animation are intentionally set up to be flat, the creation space and depth is not the major concern. The functions of colour in my animation project are to create effects and evocate moods in the story.

There are several colour schemes used in this animation for different visual style settings. A monochromatic black-and-white colour scheme was used in scenes after the penetration of the worm to convey the feeling of anxiety and shock. The same black-and-white colour scheme was used in the scene where Sophie is struggling to pull the worm out in her room to show her nervousness and panic. A triadic colour scheme that consists of “three colours spaced equidistantly around the colour wheel” (Fraser & Banks 2004, pp. 42-3) was used for the first scene to convey Sophie’s joyfulness, almost childishness before she encounters the worm. I set up the colours with similar high brightness and low value (saturation) to have them work harmoniously. This principle was applied in all the scenes with colours except for the scene of Sophie’s nightmare. A simpler colour scheme, consisting of only two complementary colours, was used in the scene of lounge room in Sophie’s home with her parents to show the seemly safe environment. A similar complementary colour scheme with lower value (saturation) was applied to the last scene to convey a soothing and relaxed feeling after Sophie solves her inner conflict about the secret. The scene of Sophie’s nightmare has black-and-white background and worms with various high brightness and high value colours to convey the feeling of weirdness.

4.5.3 Character Design

McCloud (1993) proposed a triangular model (Figure 13) of visual styles for comic book characters, which is also fruitful for the discussion of character design in animations. Visual styles of comic books have significantly influenced the visual styles of traditional 2D hand drawn animations. Some American animations are adaptations of comic strips, especially superhero
series such as Superman or Spider-Man (Beck, Katzenberg & Plympton 2004, p. 207). In Japan, the transfer of popular comic books into 2D animations as TV series has a long-term tradition, and is still the major business model in Japanese animation market (Poitras 2001).

Compared with Furniss’ and Wells’ model in 4.2, the ‘reality’ in McCloud’s is similar to the ‘mimesis’ in Furniss’ model. The ‘picture plane’ is similar to ‘abstraction’ in Furniss’ model and ‘experimental’ in Wells’ model. In addition to ‘reality’ and ‘picture plane’, he added ‘iconic’ or marked as ‘meaning’ as a third pole to form a triangle plane. The ‘iconic’ characters were represented through simplifying features of humans or animals. Iconic character designs and realistic backgrounds appear in many Disney’s line and cel animations and Japanese anime. Similar aesthetic approaches are also applied in many feature length 3D computer animations such as \textit{Incredibles} (2004). The design of characters including the protagonist, Bob Parr, is stylised and exaggerated, while backgrounds remain realistic.

The character design in my animation fits in with the ‘iconic’ area in McCloud’s triangular plane. All the characters and animals were designed with simplified figures. They are neither 

\textbf{Figure 13} Triangular model derived from McCloud (1993)
realistically rendered nor abstractly represented.

For the design of the protagonist girl, Sophie, a series of sketches was created until I satisfied with the final design. The first sketch of Sophie was created on November 2006 as displayed in the Figure 14.

I set up that the girl has a sensitive and nervous personality since she holds a secret in a major part of the story and she is anxious about it. I considered the design of the girl with a skinny figure, which is likely influenced by Sheldon’s (1970) theory. He proposed a theory that the human physique is related to the temperament. He categorized human figures into three basic body types. Each type has its correspondent trend of temperament. An endomorphy type, a round shape of body, corresponds to an easy and relaxed personality. A mesomorphy type, a muscled figure, corresponds to an active and energetic personality. An ectomorphy type, a thin and fragile figure corresponds to a personality of ‘introvert’ (Sheldon 1970, p. 228). An introvert personality is used to describe a person who is sensitive and fragile. This theory was criticized and questioned by other scholars (Sutherland 1951) for human personalities are too complicated and are influenced by many factors such as heredity and environment. Thus this categorization can be seen as a reference, but not an absolute rule. However, many animations use this theory
of body types as a reference for their character designs. For example, in *The Nightmare Before Christmas* (1993), Jack Skellington, the protagonist, is a sensitive thinker with an extreme skinny figure. On contrary, Santa Claus is designed as a warm and easy person with a round shape. In my animation, the skinny shape implies the girl’s sensitive personality, while her parents’ indifference:

![The second sketch for the design of Sophie](image1)

**Figure 15** The second sketch for the design of Sophie

![The third sketch for the design of Sophie](image2)

**Figure 16** The third sketch for the design of Sophie
Some different designs for Sophie were created before the storyboarding (Figure 15 and Figure 16). I applied the design of Sophie in Figure 16 when I drew the storyboard in April, 2007. I felt that Sophie is a teenage girl so her dress should look younger in terms of fashion. The design in Figure 15 shows more a mature ‘dressed up’ look.

I changed the design of her facial features by referencing the facial features of characters in anime. It is a visual convention in anime that characters have large eyes (Brophy 1994; Poitras 2001, pp. 59-60). Several versions of facial features, especially eyes, were developed as following per the following sketches. The triangular face is also a significant feature contributing to the cuteness of girl characters in anime. I applied these features in the design of Sophie’s face.

![Figure 17 Facial design of Sophie](image)

Continuing with the idea of skinny body figure as discussed earlier, I came up with the final design of the girl with very slim proportions by referencing characters in a Japanese comic book, *Nana* (Yazawa 1997-). My rough sketch of Sophie and one character from the comic book are compared as following:

![Figure 18 Character design by referencing Nana (Yazawa 1997-)](image)
I then moved to the 3D computer program to design the details such as the hairstyle, and to experiment with visual elements such as colours and textures.

The design of the worm also progressed through different versions until it reached the final version:

![Figure 19](image.png)

**Figure 19** Different versions of designs for the worm

The first rough sketch in the left of Figure 19 was drawn on February 2007. It is a worm has many tentacles on its head but is without a face. While developing the storyboard, I added facial features for the worm as shown in the middle of Figure 19, because there are interactions between the girl and the worm in the animation. This also fits in with the long tradition of anthropomorphosis of animals in animation. An animal character with facial expression and human-like behaviour is easier for audiences to relate to. On the other hand, the gag and exaggeration in animation is able to be developed, since viewers are aware that they are animals and not humans. I created the latest version of the sketch for the worm as shown in the right of Figure 19 in July 2007 before the modelling in 3D software started. The worm in this version has big eyes and a small mouth, which fits in with the visual conventions in anime as used in the design of Sophie’s face. It also works for storytelling purposes because it explains why Sophie is willing to approach the worm. I also developed the facial expressions in the same sketch, in which the normal facial expression looks friendly and cute, and another facial expression shows the naughty or wicked smile.

For the design of the butterfly in the end of my animation, I intended to create a graceful and organic pattern for the wings. The major inspiration for the pattern came from the design in Art Nouveau, which is “the name given to a style in the visual arts that was a powerful presence in Europe and North America from the early 1890s until the First World War…It existed in all genres, but the decorative arts were centrally responsible for its invention and its fullest expression” (Greenhalgh 2000, p. 18). The Art Nouveau style has been used to design jewellery and furniture (Fahr-Becker 1997; Greenhalgh 2000; Sembach 1991). The prominent characteristic in this style
is its flowing curvilinear forms that are inspired by the biological form. I created the curvilinear pattern for the wing of the butterfly as shown in the following figure:

![Figure 20](image)

Figure 20  A sketch of the design for the butterfly’s wing

### 4.5.4 Environmental design

For the environmental design, I used an iconic approach to represent the environment of my homeland, Taiwan. Since the creation of the story is inspired by my wife’s dream, I set up the location of the story in Taiwan where she grew up and where her parents still live. I used the sketches I drew for suburban environments and the city in Taiwan as my major reference for the outdoor scenes in this animation. In these sketches, I applied an iconic approach to simplify the elements in the environments, in the same way that I approached the character designs – to create the flatness of 2D graphical appearance. The commonly seen objects such as entangled electricity cables and disordered neon signboards are illustrated in the sketches.

![Figure 21](image)

Figure 21  Sketches of scenic elements in Tainan, Taiwan
I drew the above sketches (Figure 21) of scenic elements in suburban area in Tainan, a county in southern Taiwan. Electricity towers, antennas on roofs and electricity poles are significant visual elements I observed and houses are mostly under five levels. These sketches were used as references for the creation of the 3D environment for the first scene.

![Figure 22](image_url) A sketch to resemble childish doodles

I drew another sketch (Figure 22) in July 2007 before I created models for the environment of the first scene. I attempted to create a visual style resembling arbitrary, childish doodles to represent Sophie’s innocence and joyfulness before she acquired the secret. Combining the sketches in Figure 21 and Figure 22, I created 3D models for the environmental in the first scenes with flat buildings.

![Figure 23](image_url) Sketches of scenic elements in Taipei, Taiwan
I drew some other sketches (Figure 23) for the objects I observed in Taipei city, the biggest city in Taiwan. Signboards, streetlamps, traffic signs and lights, electricity poles and exhausting vents and pipes are significant elements in the environment. Buildings are usually higher than ten levels. These elements are applied in the design for the second scene in the project.

4.6 Other visual concepts

There are other visual concepts that significantly inform my creation of 2D graphical styles in the animation. They are animation principles, narrative strategies and the editing related to shot-to-shot relations.

4.6.1 Movement and kinetics

As discussed earlier in this chapter, the illusion of movement is probably the most important aspect of animation aesthetics. In 1930s, Disney Studio established twelve principles for the guidance in the production of traditional line and cel animation (Thomas & Johnston 1981). They are:

1. **Squash and stretch**: shape distortion of an object in action to define the rigidity and mass of it
2. **Anticipation**: the preparatory action before the next action
3. **Staging**: presenting action through composition so that it is unmistakably clear
4. **Straight ahead action and pose-to-pose action**: the two fundamental approaches to create movement
5. **Follow through and overlapping action**: the termination of an action and establishment of its relationship to the next action
6. **Slow In and slow out**: smoothing start and stop of an action through the spacing of the in-between frames
7. **Arcs**: the visual path of action to form natural movement of an organic figure
8. **Secondary Action**: the action of an object resulting from the action of another object it attached on
9. **Timing**: spacing actions to define the weight and size of objects and the personality of characters
10. **Exaggeration**: accentuating the essence of an idea through the caricature of actions
11. Solid drawing: good drawing skill

12. Appeal: creating a design of character that the audience enjoys watching

These principles had been widely applied in productions throughout the history of animation. Some additional principles were proposed by Kerlow (2003) for the production of 3D computer animation. John Lasseter (1987), the director of *Toy Story* (1995), discussed the application of these principles in the production of his 3D computer animated shorts including *Luxo Jr.* (1986). Traditional principles have also been further tested by using standard 3D computer software (Elstob 2003; Harvey 2006).

In my animation, these animation principles were subtly applied. I intended to create natural movements for characters because the story is not comic-oriented. Animation principles such as squash and stretch and exaggeration are only subtly applied. I also used computer tools to simulate the movements of objects such as hair and clothes. The realistic movement of hair and clothes is a visual convention in anime as discussed earlier. The contrast between realistic movements and 2D graphical flatness contribute to the unique, hybrid aesthetic in my animation.

Body motion and facial expression are important in the way I tell the story in *Sophie’s Secret*. I relied on visual storytelling rather than dialogue, which is similar to the form of vaudeville in animation. Use of the vaudeville form in animations has a long tradition beginning in the early 20th century (Klein 1993). The gag (storyline) in vaudeville is advanced more often through actions and music than dialogue. In the same way, animation gags are expressed and advanced mostly through action and music. Many contemporary animated shots still apply actions and music to tell stories for the maximum comprehension and appreciation across cultures. For example, the Oscar-winning short animation, *Father and Daughter* (2000), used actions of characters in silhouette and music/sound effects to tell a touching story.

The camera movement is also crucial for the creation of visual styles between 2D and 3D. In traditional line and cel animation, camera is mostly stationary and only allowed to move closer or away from the plane in which the drawings are placed. Hence, the camera movement such as panning and tilting is actually an illusion through the movement of the plane of drawing. On the contrary, in 3D computer animation, animators have an even greater freedom to move camera than cinematographers have in operating real cameras for live-action film, although the design of virtual cameras in 3D software aims to resemble real cameras. The camera can be placed in any location and moved in any speed, direction and angle, without any mechanical limits in 3D virtual spaces. However, the freedom of camera movement does not necessary yield attractive effects for storytelling purposes. In my animation project, I kept the camera movement subtle in
most of the shots so as not to break the illusion of 2D graphical flatness. However in some shots when the camera moves significantly, especially pushing forward or pulling backward, the 2D graphical images and the changing of 3D perspective create a hybrid visual appearance between 2D and 3D, for example, in the shot where Sophie runs toward her home, and in the last shot where she was carried to the sky by the butterfly.

4.6.2 Narrative strategies in animation

Wells’ (1998) identified ten narrative strategies, which are special visual approaches to facilitate storytelling in animation. Condensation and symbolization have already been discussed in Chapter 3 as two strategies that inform my animation production. Metamorphosis and penetration are two other narrative strategies identified by Wells (1998) that were applied in my production.

Metamorphosis is an intrinsic characteristic in animations produced by techniques such as 2D line and cel animation and clay stop motion animation. It is defined as “the ability for an image to literally change into another completely different image…through the evolution of line, the shift in formations of clay, or the manipulation of objects or environment” (Wells 1998, p. 69). In line and cel animation, lines and shapes are re-drawn frame by frame with human hands, so slight shifting of lines and shapes is almost unavoidable. In the making of clay stop motion animation, clay was added, subtracted or reformed for the next frame of photograph in stop motion animation. Sometimes it is an issue to keep the consistency of characters or objects in these types of animations because of the nature of shape-changing. However, many animators take advantage of this to create unique metamorphosis for storytelling. For example, the Betty Boop animation produced by Max Fleischer in 1930s applied many swift metamorphoses to characters and objects to convey comic effects (Klein 1993). Metamorphosis is used as a primary tool to express ideas in some animations such as Your Face (1987), a line and cel animation, and The Great Cognito (1982), a clay stop-motion animation. In these animations, the shapes of characters keep changing in an imaginative and unexpected way to create comic effects.

Metamorphosis between images can also be created digitally with computer technology. ‘Morph’ is a term to describe the seamless transition from one image to another through the use of computer algorithm (Furniss 1998, p. 78). ‘Morph’ can be created in two dimensional or three dimensional ways (Neuberger 2002; Zwar 2002). No matter whether 2D or 3D processes of ‘morph’ are used, points of an image or a 3D geometry need to be specified for the changing from one image or original object into the other image or geometry. The processes are tedious but not as straightforward as in 2D line and cel animation and clay stop-motion animation. It is this limitation that constrains the application of metamorphosis in computer animations.
Before the animation production, I attempted to test the subtle distortion for characters to resemble the natural shifting between frames in 2D cel and line animation. I conceived an idea to distort the 3D models without the need to modify the points as discussed earlier. I created a transparent block object and attached it in front of the virtual camera as a lens to distort characters and objects. I increased the Refractive Index attribute of the transparent object and changed the shape of it to create the distorted effects. The result is displayed in Figure 24.

In Figure 24, the original character without the distortion is shown in the left and distorted characters in the middle and right. The proportions of the characters’ upper bodies change without the need to modify the models. The proportions can change with time if the shape of the lens or the Refractive Index is keyed. However, this effect was not applied in my animation project because it conflicted with other effects, especially the creation of lines resembling hand-painted lines. However, this effect can be further applied in other projects to create unique visual styles.

Penetration is another narrative strategy I applied in the animation. It is “essentially a revelatory tool, used to reveal conditions or principles which are hidden or beyond the comprehension of the viewer…It becomes the very method which defines or illustrates particular kinds of experience which do not find adequate expression in other forms” (Wells 1998, p. 122).

I planned to apply the metamorphosis and the penetration in the storyboard, which is shown in the following figures:
I applied metamorphosis and penetration in the shot of Figure 25 (a). A red dot pulses with the sound of heartbeat and then transforms into the shape of a heart. The consequent appearance of lines and shapes of colours blocks the image of heart and shows Sophie’s body. The metamorphosis from the dot to the heart and the penetration to reveal the view of the heart are applied together in the shot.

A more complex use of metamorphosis is devised in the shot of figure 25 (b) and (c). Sophie walks among passersby in figure 25 (b). In figure 25 (c), all the eyes belonging to passersby transform into strange shapes while their bodies disappear. The final images and technical issues are discussed in the next chapter.

### 4.6.3 Shot-to-shot relations

I used the storyboard as a plan to compose visual elements in shots and to consider shot-to-shot relations. “Storyboard is the bridge between a written script and the visual world of cinema”
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(Cantor & Valencia 2004). I drew the storyboard based on the final version of script I wrote (Appendix A). I modified several shots according to feedback from others. The final version of storyboard is attached in the Appendix B.

Montage and special transitions between shots are the two major considerations in the storyboarding in my project. They are usually processed in the editing stage of live-action filmmaking. Editing is essential to live-action filmmaking to conduct “the task of selecting and jointing camera takes…the set of techniques that governs the relations among shots” (Bordwell & Thompson 2004, p. 52). Unlike live-action filmmaking, in animation production the shot-to-shot relations are often set up in storyboarding stage to avoid the waste of finished animation sequences. Animating is often very time-consuming so to discard any of the finished animation shots would be a waste of money.

Montage is a significant concept of cinema developed by Soviet filmmakers. In this project I especially draw on Eisenstein’s (1949) notion about montage in filmmaking to create a disconnected, dream-like effect. Ideologically, he believed that through dialectic conflict and collision of opposing components, new meanings emerge. Practically, “it emphasizes dynamic, often discontinuous, relationships between shots and juxtaposition of images to create ideas not present in either shot by itself” (Bordwell & Thompson 2004, p. 504). Bordwell contends that the montage forces viewer to interpret the implicit meaning of the discontinuous juxtaposition. The concept of montage is often adopted by film production in Hollywood to express an altered state of mind such as flashback, illusion, and dream sequences through rapid cutting with discontinuous segments (Halpern 2003).

In the storyboarding stage, I planned to apply the concept of montage in the scene where Sophie sees a worm emerging from an apple. The consequent shots are juxtaposed by numbers of apples, her parents, the dog and the moon in different locations. They all have worms inside. This montage sequence represents Sophie’s imagination, through which she realizes that everyone has a worm inside and thus resolves her inner conflict of the secret.

In the production stage, I added a montage dream sequence for Sophie to make it visually stronger than the plan in storyboard. The montage sequence is a rapid cutting of short-length shots to juxtapose images of dancing worms in her nightmare and other images of events that terrify her, such as the worm’s penetration.

I planned two special transitions between scenes in the storyboarding stage to take advantage of using 2D graphical styles. The first is to transit between Scene Two and Scene Three to connect two very different visual styles:
In the Figure 26 (a), Sophie runs though passersby on a street. All the background and passersby gradually smear and disappear to dark. She keeps running until a door emerges in front of her. She opens the door and then light emits from the room behind the door. The whole scene fades into white and transits to next scene. The images before the transition are dark, black-and-white and messy to imply Sophie’s anxiety, while the images after this transition are clean and tidy, with a white background to show a seemly safe environment.

The other special transition I planned in storyboard was between Scene Five and Scene Six to create a visual impact through a rapid zooming (Figure 27).

The image in Figure 27 (a) is the last shot in Scene Five. The extreme close-up of Sophie’s eye shows her shock after she discovers that worms extrude out of her parents. The camera zooms in swiftly into Sophie’s eye and reveals the group of worms that are dancing on a roof in Figure
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27 (b). However in production stage, I changed it into a fade in and fade out transition because I considered the transition would be too confusing to the audience. The two shots should not be connected so closely that they might mislead the audience into thinking that Sophie sees dancing worms. The worms are actually in Sophie’s nightmare.
Chapter 5

Concretization in Production processes

In this chapter, I discuss the issues regarding the production processes in the creation of multiple visual styles to facilitate a dream-like quality in my animation. I first compare the standard production pipelines of 2D cel and line animation and 3D computer animation, and discuss what is unique in my production workflow in my 3D computer animated short film. I then discuss the key processes in 3D computer production and specific techniques that inform the creation of 2D graphical styles. Finally, I describe the techniques used in my animation production scene-by-scene.

5.1 Workflows in animation production

The workflows of 2D cel and line production and 3D computer production have some similarities and intrinsic differences.

The standard workflows of 2D line and cel animation and 3D computer animation productions are displayed in Figure 28 and Figure 29 (Winder & Dowlatabadi 2001, p. 242).
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Basically, processes of pre-production and post-production are similar in both 2D and 3D workflows (Milic & McConville 2006, p. 116 & 40). The pre-production involves script, character and location designs, and storyboard. The post-production includes the composition of all visual elements together with audio elements.

There are two essential differences between 2D line and cel animation and 3D computer animation workflows. Firstly, the processes in 2D workflow proceed one after another whereas some processes in 3D computer progress in parallel. This is because the digital processes in 3D computer animation help to automatically generate images, and digital data is easier to transfer and replace. In 3D computer production, after a storyboard and designs of characters/locations are finished, the processes including modelling, texturing and animating all proceed digitally. Textures on objects can be replaced and lighting can be adjusted after animating is finished. On the contrary, in 2D line and cel animation, although images are also digitised in the computer for final output, the frame-by-frame hand drawing is still the major process used to create the illusion of actions. The inking and painting process that gives colours and texture on the characters can only be commenced after the sequences of frames with characters’ actions has been tested and finished, which is usually called ‘pencil test’ (Beckerman 2003, pp. 203-5).

Figure 29 3D computer animation workflow derived from Winder & Dowlatabadi (2001)
The second, between the two is that in 3D computer workflow, more processes are needed before the animating process is commenced but the animating and images output process are likely to be less laborious than those in 2D processes. In 2D workflow, animating process can be started right after character and environmental design and rough layout are finished, but in 3D workflow, many processes such as modelling, texturing and rigging are required before animators can start animating. These processes are usually time consuming and laborious. However, after those processes are finished, computer programs help to speed up the animating and the output of images. Animators set up key poses and the computer calculates the in-between frames, which need to be drawn by hand in 2D processes. Character and environment models can also be reused for animating all the scenes in an animation. After all the visual settings and animating are finished, the rendering process automatically generates images in the computer. In 2D workflow, the detailing of images such as the linking process is more a frame-by-frame process that is labour intensive. The preparatory processes before animating in 3D computer animation are comparable to processes used in stop-motion animation. The making of characters and the building of environmental sets are necessary before animating in stop-motion animation (Shaw 2003). The animating process can also advance quickly by moving characters and pushing the button to capture the frames with cameras.

Short animations are usually produced by one person or a small group of people. A workflow for short 3D computer production is shown in the following figure (Cantor & Valencia 2004):

![Figure 30 Workflow for 3D short production derived from Cantor & Valencia (2004)]
The workflow of 3D short production is similar to that of studio production shown in Figure 29. Key processes including modelling, texturing, rigging and animating remain the same. The major difference is likely to be the number of characters and scale of environmental settings. In a small production, with a relatively small personnel, the number of characters and the scale of environments need to be limited. Animators need to work on several different processes or on all the processes.

In my animation production, workflow is simplified and is more flexible in a scene by scene basis with the advantage of using 2D graphical styles. The workflow is displayed in the following figure:

![Workflow Diagram](image)

**Figure 31** Workflow for the production of *Sophie’s Secret*
All key processes including modelling, texturing, rigging and animating are in the workflow but many of them are also simplified. These key processes are discussed in the next section.

A significant difference in this workflow is the scene-by-scene base, which is different from the workflow shown in Figure 29 and Figure 30 where animating process starts after all the models are finished, rigged and textured. First, I built models of main characters, Sophie and the worm, which were used in most of the scenes in animation. Then I started modelling the environmental settings and considered the visual appearance for the first scene. After the animation in the first scene had been finished, I built extra models needed for the second scene and experimented with the visual style in this scene. Some character/environment designs are also integrated into this workflow. For example, I designed the pig parents and the various dancing worms just before the production of the scenes where they are included. This flexible process allows me to develop different visual styles as artistic expression. The flexibility of production processes benefit from the choice to represent the story in 2D graphical styles. In the next section I discuss the reduction of complexity in key processes in my production.

5.2 Key processes in 3D workflow

In this section I discuss key processes in 3D production workflow and how the complexity of these processes including modelling, texturing and rendering are reduced due to the demands of creating images in 2D graphical styles.

5.2.1 Modelling

Modelling “is the process of building the objects that are going to be placed in front of a (virtual) camera. Whether the item is a character, prop, or an environment” (Winder & Dowlabadi 2001, p. 248). The modelling process in my project is based on the method used in the 3D computer animation industry. I first created hand-drawn designs for characters and environments. 3D models are built and modified based on these hand-drawn designs.

The modelling process was simplified in this project because the building of topographical details was not necessary for 2D graphical appearances. The complexity of building anatomy details for characters (such as bumps or concaves) was reduced because flat colours would be filled into the shapes in the final images. Instead of considering the three dimensional geometries, I focused on the appealing silhouettes and the outlines of character models, since they define the shapes of characters.

5.2.2 Texturing
In 3D computer animation, texturing is a process used to define how surfaces of 3D objects look (Laybourne 1998, pp. 237-8). As discussed in section 4.3.1, the film industry has pursued the creation of realistic images with 3D computer technology. Texturing and lighting are key processes used to create convincing, realistic images in three-dimensional spaces. The method uses maps such as colour maps and bump maps to wrap on objects for the presentation of surface properties. Physical properties such as reflection and opaqueness also need to be considered in order to create a realistic look.

In my project, concerns regarding physical accuracy and surface properties were not necessary. Instead, I used the quality of lines and shapes to define the characters and spaces. The creation of lines and shapes with 3D computer techniques is discussed in the section 5.3.

**5.2.3 Rigging and Animating**

Rigging is a process of “creating a character’s internal skeleton and any necessary movement controllers and special functions” (Cantor & Valencia 2004, p. 286) to a model so that body parts are connected and can be manipulated by an animator. These skeletons work in a similar way to armatures, which are built up in stop-motion characters to enable them to be manipulated. The rigging and animating process in my project are based on standard processes of 3D production.

The way I animated the characters in this project is based on the pose-to-pose method. As discussed in section 4.5.1, pose-to-pose and straight-ahead are the two basic approaches used to animate characters in traditional cel and line animation (Laybourne 1998; Whitaker & Halas 1981). In pose-to-pose animation, key poses are created first and then in-between frames are drawn to connect the key poses. In straight-ahead animation, animators draw frames of actions in the same sequence as they are shown to create the illusion of movement. In general, straight-ahead method creates flowing, spontaneous actions, while the pose-to-pose method has more structured action and better control of the overall composition. Pose-to-pose is a popular way to animate in 3D computer animation (Lango 2001). The setting of key frames for the computer to calculate the in-between frames underlies the 3D computer animating process. For a 3D computer character, there are usually many parts of the body such as hands and legs that can be set individually as key frames. Although the straight-ahead approach can also be applied in 3D computer animation by setting the key frames individually and spontaneously for each part of the body, the management and manipulation of all the keys set in this way takes much effort. In the process of the animating, I started to set key frames for all parts of the body to create poses and then shifted keys for some parts of the body to break the stiffness. By doing this, I kept the animating process organized and had the control of the overall composition.
Layering of action is also an advantage in the animating process of 3D computer production. Two or more actions can be blended together to form a desired action. Each action can be manipulated and shifted in terms of timing. I used this technique in animating some characters in my animation. The Figure 32 shows an example.

I completed a walking cycle for Sophie and stored it as a basic action. The action of walking is shown at the top layer of figure 32. I added more actions such as the turning of her head afterwards, and stored them in another layer. In this way, I obtained more flexibility in the animating process.

5.2.4 Rendering

Rendering is a “process through which the computer takes all of the data that define a 3D scene, including models, textures, lights, and camera, and creates a 2D image of that scene” (Laybourne 1998, p. 241). Rendering is possibly comparable to the painting and inking process in 2D animation workflow, because both of them are processes used to detail images for final appearance. Both of them are also time-consuming processes, although rendering process is less labour-intensive than the inking and painting process. For realistic oriented 3D computer animations, images of a scene may require hours or days to be fully rendered.

In my animation, the rendering time is significantly reduced for its 2D graphical styles. The Figure 33 is a comparison of two characters in different styles.
The character on the left is the one that I created for my previous short film with a realistic-oriented appearance. The girl character on the right is Sophie in this animation. Using the same resolution of 768 by 576 pixels rendered in the same computer, the render time for the man is 17 seconds and the render time for Sophie is only 3 seconds. For the PAL system I used for this project, the frame rate is 25 frames per second. In a five-minute short animation, there are:

$$5 \times 60 \times 25 = 7500$$ frames

Fourteen seconds is the difference of the rendering time between the two characters for a frame. For a single layer of character, the accumulated rendering time difference is over a hundred thousand seconds, which is about 30 hours. Moreover, a production with a realistic style usually needs multiple layers for foreground and background images. Multiple passes such as colour pass and specular pass are often rendered separately for a layer in order to gain more control over the final images. The accumulation of the time difference between the two styles for a five minutes short film can be more than ten times the 30 hours. Significant rendering time is reduced when a graphical style is applied.

### 5.3 Techniques and preliminary test for 2D graphical styles

In this section I discuss techniques to create 2D graphical styles with 3D computer technology. I also discuss my preliminary testing of methods I used to achieve these styles before the animation production.
5.3.1 Non-Photorealistic Rendering and toon shading

Non-photorealistic rendering (NPR) is “the family of techniques that can be used to produce scenes that do not exactly resemble the real world” (Burgess, Wyvill & King 2005). This definition outlines a wide range of techniques developed in the field of NPR. “NPR generally tries to mimic images made by hand…” (Strothotte, Schlechtweg & NetLibrary Inc. 2002, p. 13). Usually, the purpose of NPR is to resemble a picture created by artists. There are basically two categories of non-photorealistic computer techniques. One is the application of algorithms to modify photographs acquired from the real world to resemble paint-like or drawing-like images, according to the designer’s intention. For example, an algorithm is used to manipulate photographs into an appearance of an oil painting (Hertzmann 2002). The other includes techniques used to output images from a virtual 3D environment with painterly or illustrative appearance (Lu et al. 2003; Savchenko, Unno & Kojekine 2002). There are a variety of techniques that can be used to simulate pictures created by artists. For example, techniques are used to simulate pen-and-ink illustrations (Wilson & Ma 2004) or various type of paintings (Chi & Lee 2006). The techniques used in my project fit into the second category, since most of images are rendered and outputted from 3D computer programs.

Toon shading, or cartoon shader, is a technique defined as “mimicking the look of hand-drawn cartoons, these shaders create a black outline around the perimeter of your (3D) model, and simultaneously limit the number of colours on the interior surface to a very few” (O’Rourke 2002, p. 260). Both NPR and toon shading are techniques to digitally simulate 2D artistic works. Non-photorealistic rendering usually refers to techniques encompassing algorithms developed by researchers in the computer science field. Toon shading is either a function embedded in standard computer animation programs such as 3ds Max (Bonney & Anzovin 2005, pp. 842-8) or algorithmic scripts and plug-ins developed by individuals or in-house programmers of production houses, such as Disney Studio (Teece 2003). Toon shading scripts and plug-ins developed by individuals are often available online for free while those developed by in-house programmers are protected by production houses. All toon shading scripts and plug-ins are designed for use under the structure of standard commercial programs. Some effects developed in non-photorealistic rendering can be created comparably in standard 3D computer programs. For example, the comparison of brush strokes simulated by an algorithmic particle system (Fischer, Bartz & Straßer 2005), and an image rendered from the particle system in my preliminary test from the commercial 3D program, Maya, is shown in following figure:
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Other effects created by non-photorealistic rendering are not easy to achieve by standard 3D program with scripts and plug-ins. For example, Wilson & Ma (2004) developed a process to create images from 3D models in combination with 2D and 3D processes. One image rendered from their system is shown as following:

![Figure 34](image1.png)

**Figure 34** Comparison of images created by Fischer, Bartz & Straβer (2005) in the left and the rendered images in my preliminary test with standard 3D program in the right

The natural pen-and-ink appearance is not easy to achieve with commercial 3D programs. To develop algorithms of non-photorealistic rendering is beyond my ability and the scope of this research. The techniques that I applied in this project are basically functions provided by standard 3D computer programs, or scripts and plug-ins that are available online.

![Figure 35](image2.png)

**Figure 35** Image with pen-and-ink style created by Wilson & Ma (2004)

Independent animated filmmakers and some production houses have applied NPR and toon
shading techniques to create 2D graphical styles. There were some attempts to produce full-length 3D computer animations with 2D graphical styles. *Walking Life* (2001) and *Scanner Darkly* (2006) were filmed in live-action and then computer algorithms were applied to modify live action footages into painterly appearance in the post-production process. *Renaissance* (2006), a 3D computer science fiction film, applied motion capture to virtual characters. The film was rendered in a high contrast back-and-white style, which was influenced by the original comic book (Zahed 2006).

There are more 2D graphical approaches in short 3D computer animations, and these are usually screened in film and animation festivals. Some of them are produced by small studios to showcase their work; others are created by university students to present their capability in aesthetics and skills. For example, *L’Enfant de la Haute Mer* (2001) and *Le Processus* (2001) are two animated short films that were created by students in SUPINFUCOM, a school in Valenciennes, France. They were selected to be screened in the animation theatre of SIGGRAPH, an annual conference of computer graphics, in 2001. Images in *L’Enfant de la Haute Mer* (2001) were rendered with 3D computer techniques to simulate the appearance of water colour painting (Cantor & Valencia 2004, p. 116). In *Le Processus* (2001), black-and-white stripy textures are applied on characters and objects to present a woodcut-like visual style.

In addition to animation shorts, some TV commercials, music videos and game trailers experimented with visual styles by creatively using 3D computer techniques. PSYOP, a New York base studio, has produced TV spots and music videos that are acclaimed for their concepts and aesthetics. PSYOP was founded in 2000 and grew to a medium-sized studio with a team of 32 people in 2005 (Romanello 2005). In some of their works, visual styles are created in combination of graphical design and 3D computer technology. Todd Muller, one director in PSYOP, described the concept in the production of a music video for Sheryl Crow, a pop singer, saying: “we wanted to give it a two-dimensional quality, but still have a lot of three-dimensional dynamics. There was a lot of interplay between 2D and 3D” (Romanello 2005, p. 32). The interplay of 2D and 3D is also a major purpose of exploration in my animation project. *Monster Farm 5 Circus Caravan* (2006) is a game trailer that was selected in the electronic theatre collection of SIGGRAPH in 2006. Similar to the approaches in PSYOP’s TV spots, 3D computer techniques were used to render out 2D graphical images. They both took advantage of the 2D graphical styles to play visual tricks. For example, the object in the foreground blocks a character while the camera is moving and the character appears from a different angle or poses in a different location after the blocking object moves away. I experimented with similar visual trick in the first few shots of the animation.
5.3.2 Lines and shapes in a 3D space

In this preliminary test, I used toon shading techniques to simulate hand drawn lines and shapes in a 3D space. I referenced the visual style of *Gerald McBoing Boing* discussed in section 4.4.1 to create this space with minimal visual elements. The 3D wireframes and the rendered images are displayed in the following figure. The result of this test was further applied into my animation production.

![Figure 36](image)

(a) Geometries are rendered in 3D wireframes
(b) Geometries are rendered with Toon Shading

Figure 36  The wireframe and rendered images for the test

Lines and shapes were basic visual elements under experiment in this test. Several different qualities of outlines are rendered to define the objects in this space. Plain colours were used on the 3D objects to create a flat visual appearance. Many objects are set in white colour to blend into the plain white background. With this approach, visual elements are reduced and outlines are punctuated.

Experiment with the qualities of lines was the particular focus of this test. A function in 3D computer program called Paint Effects was used to simulate hand painted brushes. For the simulation of hand painted brushes, the Disney Studio has developed a system called Sable for its animated projects (Teece 2003). A set of hand-painted brushes are used as a library and mapped on NURBS curves that are attached on 3D geometry. They have integrated this system into their production pipeline with other commercial 3D computer programs and in-house computer renderer for the animation project, *Lorenzo* (2004). While Disney’s Sable system used scanned hand painted brushes as a library, Paint Effects procedurally created brushes in 3D programs for application. These brushes can be manipulated or further animated to simulate the brush variation between frames in an animation.
In some 2D line and cel animations, lines and inking shapes of objects are intentionally offset to create stylised appearance. To emulate this effect, I created two 3D models for a sofa in this test. One is for the display of outlines and the other is for inking shape. The 3D geometries and rendered images of the sofa are shown in the following figure:

![Figure 37 Brush simulation for a sofa](image)

(a) 3D wire frame of the geometry  (b) Outlines  (c) A shape with single colour  (d) Final rendering of line and shapes

The coherence of the brushes on an animated character was also experimented with in this test. I created a 3D model of little girl character and then rigged and animated the character for the test. I applied different brushes for the outlines of this character. The lines with great width and low opacity for the crease of the model create a random, flashy effect around the girl’s skirt and face as displayed in the following figure:

![Figure 38 Images in the test of brush coherence](image)
Camera movement was also applied in this test to examine the perception of space in a 3D virtual environment. Some objects, such as the sofa in virtual space, are rotating while the camera is moving. Since there are no clues for three-dimensional perspective, the rotation of these objects is not easily sensed. This will give the animator freedom to obtain a desired angle by slightly adjusting the position of objects while the camera is moving.

Randomness and imperfection is a significant principle for the creation of images from 3D computer programs and it is equally important for the simulation of lines and shapes. Perfect geometry with glossy surface of materials proved to be unattractive in the early production of 3D computer animation (McLaughlin 1986, pp. 35-48). One possible reason is that the eyes of human beings are used to the real world, and materials and objects in the real world are never perfect. For realistic oriented computer generated imagery, dents and dirt are added to textures to break the perfection of computer generated material. Slight distortion of human or animal figures makes them more believable. The randomness and imperfection are also visual hallmarks of many traditional 2D line and cel animations because human drawings and touchings are never perfect. Some independent animated filmmakers such as Phil Mulloy and Don Hertzfeldt even accentuate the effect of imperfection to create their unique visual styles. The simulation of the human touches of lines and shapes by breaking the perfection of images generated by computer is also likely to be the way to make the images attractive. The early attempt to create 2D graphical images of 3D computer animations such as Gas Planet (1992) applied steaks on objects in scenes. The streaks in this animation are moving with time to simulate the random human drawings. In my preliminary test and other projects in this research, randomness and imperfection are the guiding principles for the experiments using 3D computer techniques to create 2D graphical styles.

5.3.3 Procedure texturing and particle system for 2D graphical styles

In the second preliminary test, I used texturing techniques and particle simulation to experiment with the visual styles of shapes created from 3D computer software. I set up a black-and-white colour scheme for this test to create a simple and high contrast appearance. The results of this test were applied in my animation production.

In this test, I created a model of fish with very simple geometry, animated it to swim through the path of a close curve and made this animation a loop.

I first experimented with procedure textures for the creation of the shape of this fish. A procedure creation of texture “relies on mathematical functions or computer programs to create images that are usually abstract” (Kerlow 2003, p. 253). Procedural textures are images created by algorithms in
3D computer software without any involvement of photographs and hand paintings. The patterns of procedure textures are often pseudo-random or rhythmic so they are now only subordinately used for realistically oriented 3D computer animations. However, the abstract, pseudo-random and rhythmic characteristics of procedure textures can be useful to create 2D graphical styles. Moreover, the procedure used to experiment with visual styles created by procedure textures is flexible and efficient, because the attributes of these textures can be modified in the same 3D computer software. I experimented with many different types of procedure textures and kept successful results. These results were further applied in the animation production. One of the satisfactory results is shown in the following figures. The visual style resembles the appearance of artwork created by the wood-cut technique.

![Figure 39](image)

**Figure 39** Procedural texturing on the fish for the second preliminary test

I applied the particle system to experiment with visual styles on the same fish model in this test. The particle system is 3D computer technique that is often applied to create motion for natural phenomenon such as snowing and flowing of liquid (Kerlow 2003, pp. 350-1). Particles do not have specific shapes or volume in 3D computer program, but they can be used to control or interact with 3D objects. The behaviour of particles is calculated by computer algorithms according to physical laws, and the result is used to create motions such as collision or turbulence.

In this test, dynamic, watercolour-like styles were created with the application of particle system. A simple black-and-white procedure texture is mapped on the fish model as the previous test. I then set up particles to be emitted from the surface of the 3D model. I experimented with attributes such as shapes and size for the particles. The particle colour is set to base on the colour of the surfaces that emits them. I also modified the size, transparency and the lifespan for the particle system to achieve desirable appearances. The following figures show the result of some desirable results of the experiment.
5.4 Production scene by scene

In this section, I present reflection and discussion regarding the production processes and technical issues scene by scene. This animation was produced in a scene-by-scene base with different visual styles, so the technical problems and decision-makings I encountered in one scene may not apply to another scene.

Scene One

As discussed in section 4.4.4, for the design of the background in this scene I combined the visual elements in my sketches for suburban in Taiwan and the doodle-like images. For the buildings in this scene, I randomised the shapes of 3D objects to break the crisp lines generated from 3D computer software. A colour scheme with similar value (saturation) and brightness was used to convey a joyful and harmonious atmosphere before Sophie encounters the worm. For the sky background, I experimented with black-and-white streak textures to contrast with the colourful doodle-like buildings and to imply the consequent weird situation for Sophie. Figure 41 shows images for the experiment of the appearance of the sky:

Figure 40  Particle system used for shading on the fish for the second preliminary test
For some buildings in the Figure 41, I used texture patterns that projected to camera to create a graphical appearance. The red curve pattern and the black circle pattern on the houses are the procedure patterns projected to camera. These patterns remain in the same position in the frame with the same shape of circle and curve no matter how the camera moves. These visual elements help to break the perspective view in virtual 3D spaces.

I experimented with some 3D techniques to create the visual conventions in anime that are discussed in section 4.4.2. The first uses special background to convey the moods of the characters as shown in the following figures.
In the left image, the sun with radiation in the background presents the attractiveness of the worm with a cute face. In the right image, which is the next shot, the flowers in the background behind Sophie, show her feelings of affinity to the worm. The background is changes with the mood of the shot. Before the worm jumps and penetrates into Sophie’s chest, the background of sun changes into black-and-white irregular concentric circles at the same time as the facial expression of the worm becomes mischievous.

Realistic movement of hair and clothes is also a visual convention of anime I applied in this animation. I used dynamic simulation in 3D computer software to create these realistic movements. Dynamic simulation involves “animation techniques [that] generate realistic motion of objects by simulating their physical properties and the natural laws of physical motion” (Kerlow 2003, p. 341). The contrast between the realistic movements and 2D graphical texture creates a unique visual look.

Another visual convention of anime I applied in my animation is the cross-dissolve of action. Instead of using a continuous action, several still images are cross-dissolved to show the progress of this action. In anime, this technique is not only applied to save the number of drawings but also emphasize the uniqueness of the moment. I applied this cross-dissolve action when the worm penetrates into Sophie’s body. During these cross-dissolved images, the images of the shot transit from colour to black-and-white to indicate the change of mood in the story. The following figure shows two images of this cross-dissolve action:
I used 3D computer software to create lines on the worm in the opposite movement direction to present its speed. This is a simulation of ‘dry brushes’ techniques in traditional 2D cel and line animation as discussed in section 4.4.2. The same technique was used to create lines in the background to emphasize this action.

The notion of penetration, one of the narrative strategies of animation discussed in the section 4.5.2, was applied in this scene to reveal Sophie’s heart (Figure 44).

The gradual appearance of lines defining Sophie’s body at the end of the same shot reminds the audience that this is an animation created by an artist. The presence of artist is one characteristic of experimental animation discussed in section 4.2. The inspiration to create this sequence was from the beginning of *Gerald McBoing Boing* where Gerald and his parents appear with the revealing of strokes.
Scene Two

I used the sketches in Figure 23 as references to create the urban environment in Scene Two. Different from the colourful flat planes in the Scene One, the buildings I set up in this scene have three-dimensional volume, and are with a black-and-white colour scheme to convey a heavy and oppressive atmosphere.

Some techniques used in the Scene One were repeated in this scene. The camera projection is applied on the signboards of the buildings. Dynamic simulation is applied for the movement of flags on the street and the steams discharging from the exhaust on top of a building. Speed lines or dry brushes are applied for the cars running on the street. The geometries of buildings in this scene were also randomised to break the perfection of 3D computer generated images.

Figure 45  Images of environmental background in Scene Two

One challenge in this animation project was the sequence in which the bodies of passersby’ disappear, and their eyes metamorphose while Sophie is walking among them (as planned in storyboard in Figure 25). In order to create this effect in this shot, I rendered six separated image layers including Sophie, buildings in the background, two layers of passersby and two layers of their eyes. The six layers and final image are shown in Figure 46. The eyes are actually planes that are attached to the 3D models of passersby so they can be rendered in the separated layer without influence on the shapes. The opacity of these layers thus can be manipulated to create the effect where buildings and passersby’s bodies disappear, while their eyes transform into weird shapes.
Process

Figure 46  Layers of images and the final compositing image in the shot 18
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The silk-like strings that grow from their eyes are created by the tool Paint Effects in the 3D computer software. Paint Effects is often applied to create plants in 3D environments. Attributes in Paint Effects can be adjusted to simulate the growth and natural movement of these plants. I manipulated these attributes to create these fast growing, silk-like objects.

Another challenge in this scene is to create a special transition where all images smear out when Sophie is running toward her home as planned in storyboard (Figure 26). I used a tool called Fluid Effects in the 3D computer software to simulate the effect of smearing.

![Figure 47 Smearing effect of images before Fluid FX (left) and after (right)](image)

Fluid Effects is often applied to create objects such as water and clouds. I rendered some images of passersby and background in this shot and imported them as initial states on the 2D fluid container. I rendered the fluid simulation to create sequences where these images are washed out. I placed these sequences with the original images and modified the opacity of these images to create the smearing effect. The image in the left is the original image and the image in the right is that to which fluid simulation has been applied.

**Scene Three**

I used the environmental models created in the first preliminary test (discussed in section 5.2.2) for this scene to create the lounge room and the kitchen of Sophie’s home. Inspired by the design of minimum and suggestive space in *Gerald McBoing Boing*, I created a very tidy space that seems to be safe for Sophie.

Sophie’s parents were portrayed as pigs to convey symbolic meanings as discussed in Chapter 3. The clothes that they wear represent the gender stereotype where the male is in the formal suit with necktie and the female is in an apron, working in the kitchen. I created the sketch for the
pig parents in October 2007 before 3D modelling:

The behaviour of Sophie’s parents also ironically reflects stereotypes of gender roles in families. In *Gerald McBoing Boing*, the father is reading a newspaper and the mother is sewing on a rocking chair. In my animation, the father is watching TV in the lounge and the mother is washing dishes in the kitchen.

I changed the design of the pig parents to a more human-like figure after all the animation had been completed, because some viewers expressed confusion as to the identity of the characters when I tested the animation on them. The final rendered images of pig parents are shown as the following figures:

**Figure 48** Design for Sophie’s ‘pig’ parents

The behaviour of Sophie’s parents also ironically reflects stereotypes of gender roles in families. In *Gerald McBoing Boing*, the father is reading a newspaper and the mother is sewing on a rocking chair. In my animation, the father is watching TV in the lounge and the mother is washing dishes in the kitchen.

I changed the design of the pig parents to a more human-like figure after all the animation had been completed, because some viewers expressed confusion as to the identity of the characters when I tested the animation on them. The final rendered images of pig parents are shown as the following figures:

**Figure 49** Final rendering of pig parents
Compared with the original design in Figure 48, the shapes of pigs’ head were modified with more humanlike features such as hair. I kept the pig-like snouts as a compromise between the articulation of story and the symbolic meaning of the parents as pigs.

Scene Four

In this scene, Sophie struggles to pull out the worm from her chest, I intended to create images with dark colour to convey her depressed feeling. The visual style in *Histoire tragique avec fin heureuse* (2006) was the major inspiration for the creation of the environment in this scene. *Histoire tragique avec fin heureuse* is a 2D animation produced with the support of the National Film Board of Canada. The unique black-and-white, woodcut-like style inspired me to create the visual look of this room to express Sophie’s panic and anxiety as she struggles to pull the worm out. A still image in *Histoire tragique avec fin heureuse* is compared to the final test image for this scene in the following figure.

![Figure 50 A still image in Histoire tragique avec fin heureuse (left) and the image of environmental setting in Scene Four (right)](image)

I applied the result of the second preliminary test (discussed in section 5.2.3) to create this black-and-white, woodcut-like style for the expression of the horror mood and Sophie’s terror and emotion.

In this scene, I used objects with textures to achieve the dramatic light and shadow since the lighting function in 3D computer program was not able to create the desired stylised effect. I first created a light in this scene to cast most of the shadows in this scene. I then created a plane object with streak texture on its edge to create the bright area on the wall. I used another plane object to present the shadow of the bed because the place and direction of shadow cast on the wall is not visually desirable.

In the last shot of this scene, I created a special transition to reveal that Sophie is in a cocoon
shape as a symbolic demonstration of metamorphosis. This metamorphosis represents Sophie’s changing as an adolescence girl and links to the story in the final scene where the worm becomes a butterfly.

To create the transition in this shot, a layer with Sophie in her room and a layer with Sophie in the cocoon shape were rendered separately. The transition was created in post-production by gradually reducing the opacity of the first layer to zero. The layers of images are displayed in the following figures:

![Figure 51](image)

**Figure 51** Images to show Sophie in her room (left) and cocoon shape (right)

The similar technique for the creation of the lighting area on the wall in Figure 50 is used to create the cocoon-like shape in the right image. In the right image of Figure 51, the white outlines shake violently in the animation to represent her terrified and chaotic mental state.

**Scene Five**

I experimented with the sequence of frames rendered from 3D computer software by reversing and inserting frames in this scene to create special effects. The idea was inspired by Quay Brothers’ stop motion animation work: *The Phantom Museum* (2003). Close to the ending of this animation, the sequence of frames was manipulated to create a jerky and weird motion. I intended to create the similar motion for the worms when they pierce outwards from the parents’ chests. Besides the motion, I added the flickering effect in the last few shots in this scene to intensify Sophie’s shocked reaction when she discovers that the worms are coming out from her parents. Plain back images and plain white images are created and inserted to replace images in original sequence of rendered images. I rendered out this sequence with different versions. All
white image insertion and all black image insertion are rendered. I decided to interlace black images and white images for insertion to obtain a desirable effect. The following figure shows four frames in a shot with image insertion.

![Figure 52](image)

**Figure 52** The images sequence to create a flash effect in Scene Five

In the shot where the worms come out of the pig parents’ bodies, I experimented with the insertion and reversion of existing images. I completed the animation with worms coming out first and rendered out the sequence of images. Within this existing sequence of frames, I duplicated a part of frames and renamed the frame number in reverse. In the original sequence, I renamed the frame number to leave a space for the inverted sequence images to be inserted. I repeated this process several times to create the weird movements of the worms.

**Scene six**

For the scene of Sophie’s nightmare in the animation, I designed the worms that dance on the roof with various shapes, colours and texture patterns on them to create a strong visual impact. The major inspiration was the designs in *The Art of Monster, Inc.* (Doctor & Lasseter 2001). The book includes various hand drawn designs of the monsters during the visual development stage for the movie, *Monster Inc.* (2001). Those designs of monsters represent the strangeness of monsters through the use of imaginative shapes and colours, but at the same time remain accessible for audiences for their iconic figures. This is the style I intended to create for the worms. I created twenty different worms and ten of them were used as references to create the models of worms in this scene. They are displayed in the following figures:
The notion of montage was applied in this scene to create the chaos and sense of discontinuity in Sophie’s nightmare. In this montage sequence, two shots that have happened before the

Figure 53 Sketches for worms in Sophie’s nightmare

Figure 54 The rendered images for all the worms in Scene Six

The notion of montage was applied in this scene to create the chaos and sense of discontinuity in Sophie’s nightmare. In this montage sequence, two shots that have happened before the
nightmare were juxtaposed with the dancing worm sequences with rapid cut to create this effect. One is that of the worm penetrating Sophie’s body, and the other is that Sophie walking among deformed the eyes of passersby.

Scene Seven

In the beginning of this scene, the visual style remains the same as in scene four because Sophie is in the same room as she was when she woke up from the nightmare.

In the following image sequence, I applied a very different visual style to represent Sophie’s imagination. The images of apples, pig parents and dog in this sequence are created in a very iconic and cartoony way to show the optimistic inspiration she experienced by seeing the worm’s emergence from an apple. The movements in these shots are exaggerated to create comic effects. In the last shot of this scene, Sophie transits from black-and-white to her natural colour to imply her realization of the nature of the worm and her emotional change.

Scene Eight

In this scene, I planned to apply a soft, watercolor-like visual style for environmental setting, since the atmosphere in this scene is soothing and relaxed. I used the models of buildings in scene two as a base for the creation of environment in this scene. Instead of using black-and-white textures in Scene Two, I applied colours with similar value for these buildings. I used two procedures to achieve the soft and flowing effect in the final animation. The image in Figure 55 (a) is the rendered image from 3D computer program with toon shading technique. I then applied watercolor filter in Photoshop to modify the image as shown in Figure 55 (b). The functions of ‘record actions’ and ‘batch’ in Photoshop were used to modify each frame for the animated sequences. These images were brought back into the 3D computer program and applied the Fluid Effects, as used in scene two, to further modify images as shown in Figure 55 (c) for the final appearance.

I also experimented with the frame rate to slow down the last shot and reach stillness to create a sooth and peaceful mood in the end of the animation. I separated images in this shot into four groups and set up to reduce the frame rate from the regular 25 frames per second to 4 frame per second. I used digital editing software to blend these four groups of images together.
5.5 Strategies toward hybrid aesthetics between 2D and 3D

I have created multiple visual styles by referencing traditional 2D animations with 3D computer tools in this animation project. A unique, hybrid aesthetic is created through the interplay of 2D and 3D. Here are eight strategies I have formulated from the experience of creating the hybrid aesthetics between 2D and 3D in my animation:

1. As with traditional 2D animation, reduction is a significant concept that can be applied to 3D computer production to avoid unnecessary details in a graphical representation. Background setting can be reduced to its minimal. Animators can concentrate on the performance of characters and overall aesthetic composition.

2. Randomness is the principle that can be applied to eliminate the perfect, geometrical appearance of computer graphics. Randomness and imperfection are also principles for realistic-oriented 3D computer graphics that may be applied to simulate the dirty, messy

Figure 55 Images in the three stages of rendering in Scene Eight
real world. For a graphical representation, the principles are applied to simulate hand-drawn strokes and paintings.

3. Quality of lines and shapes are of major import in attempting to create 2D graphical appearances in 3D computer processes. This is very different from the concern of lighting and other physical rules used in conventional 3D computer animation to create a realistic appearance.

4. The use of 3D computer production with 2D graphical styles enhances and creates new possibilities of visual effects in relation to the transition between spaces, since images are not bound by realism. Thus, visual tricks such as the view of penetration in scene one (Figure 44) and smearing effect (Figure 47), become possible.

5. The dramatic change of a scene’s visual style, for example lines/shape/colour quality altering, has minor influence on the consistency of 3D computer characters, as the 3D models remain structurally constant. Therefore, visual styles can be explored and modified in some or all parts of the story, without the need to consider consistency issues. These described modifications are merely superficial.

6. Objects do not necessarily have to be three-dimensional in construction if they are graphically rendered. This advantage enables some visual effects or tricks. For example, eyes do not necessarily have to be constructed as spheres within the model of head. They can be two 2D planes that are attached on the surface of the head model. They can be removed or resized while the body is unchanged.

7. Dynamic simulations for the movement of hair and clothes for characters that are graphically rendered create a contrast of realism and graphical quality to achieve a visual hybridity.

8. Producing 3D computer animations with visual references to animations that are produced in other media, creates images with hybrid aesthetics. 3D computer programs are able to simulate the visual styles of other animation forms. However, the intrinsic differences between 3D computer techniques and traditional techniques can create hybrid visual styles that are in between 3D computer animation and the animation form it simulates. For example, the visual style in *South Park* (1997-) and my animation.

Here are the seven specific visual ideas that are induced from the practice of my own project and studies of the works of others to create 2D graphical styles with 3D computer techniques:

1. Texture images can be projected to 3D virtual camera for some 3D objects to break the
dimensionality of 3D spaces. For example, the flatness of buildings in Figure 41.

2. A slight distortion of 3D characters’ images with the progress of time can be applied to break the perfection of 3D computer-generated images. For example, the slightly distorted character in Figure 24.

3. The simulation of the ‘dry brush’ with 3D computer techniques can be applied to express the speed of objects or characters with 2D graphical styles as shown in Figure 43.

4. Manipulation of frames after the rendering process can be used to create special visual effects. For example, the insertion of frames with plain black or plain white to create the flickering effect as shown in Figure 52, and the changing of frame rate as shown in Figure 55.

5. Derived from anime traditions, using special backgrounds for characters is a storytelling device to express special moods of story or the emotions of characters as shown in Figure 42.

6. Manipulation of the quality of characters’ outlines can express the characters’ emotion. For example, shaky outlines can be applied to show the fear of the character as shown in Figure 51.

7. Fluid simulation in 3D computer software can be used to create watercolour-like effect or smearing effect as shown in Figure 47 and Figure 55.
Chapter 6

Conclusion and Recommendations

In the journey of this research, I have accomplished a 3D computer animated short film with multiple visual styles for a dream-inspired story. Through the reflexivity and reflection on my practice, and the investigation into contextual literature and visual materials, I have established a framework in both the conceptual and practical aspects of research, which is centred on an animation production.

Research questions have been answered through the practice of animation project, review of contextual literatures and visual materials, case studies and reflection and reflexivity of the practice in my project.

In this chapter I present the outcome of this research, key findings reached through the practice of my animation project and the investigation central on this project, and recommendations for further application and research. There are two aspects of the findings in this research. One derives from personal aesthetic judgment and critical reflection through interdisciplinary investigation on dream and narrative. This aspect may contribute to human experience but may not be easy to transfer to other productions. The other is derived from the ideas and practical techniques used to create visual styles that may be further developed in my future practice, or may become inspirations for other commercial works.

6.1 Outcomes

The outcome of this research is an animated short film and exegetical documentation. The animation, Sophie’s Secret, has been internationally accepted and exhibited. By the end of 2008, Sophie’s Secret has been scheduled in eight international film/animation festivals in USA, Japan, Brazil and Australia. They are:

Artsfest Film Festival, 23rd – 26th May, 2008, Harrisburg, PA, USA

Long Island Film Expo, 8th – 17th July, 2008, Bellmore, NY, USA

Hiroshima Animation Festival, Educational Film Market, 7th -11th August, 2008, Hiroshima, Japan

Hermosa Shorts Film Festival, 8th – 10th August, 2008, Hermosa beach, CA, USA

Melbourne Underground Film Festival, 9th – 19th October, 2008, Melbourne, Australia
A methodological model (Figure 4), derived from paradigms of constructivism and participation has been established to construct the research. In this model, content, aesthetics and processes are the three essential aspects used to frame this research, which is centred on the practice of animation production. Based on these three essential aspects, I explore related theories, locate my animation in relation to other animations as cultural artifact and apply notions gained from research activities into art practice. The multidisciplinary fields in relation to this research are organized from the methodological model as displayed in Figure 5. Heuristics and reflexivity are the characteristics in this practice-based research to successfully contribute to the body of knowledge and human experience. Keys findings are displayed in the following sections.

6.2 Dream and narrative in moving images

Dreams have inspired many art creations including filmmaking. Strong emotions and bizarre scenarios are the two overarching characteristics that have been identified in both psychoanalytic and biological studies of dreaming. In my project, I used a dream for inspiration and sought to evoke strong emotions and bizarre juxtapositions.

Theories in both psychoanalytic and biological studies of dreaming significantly inform storytelling in moving images. Symbolization and condensation, two mechanisms of Freud’s ‘dream work’, are applied in my animation project. Symbolization is especially important for the expression of meanings in the story of my animation. I expressed layers of meanings through symbols that are used in the animation and left these symbols open for other interpretations. Condensation was applied in my animation on an imagery level, to combine visual elements together and thereby express special mood and narrative levels for the ellipsis of time and space. Animation is an appropriate medium with which to express concepts and narratives that have deep psychological significance because it is not bound by the constraints of realism, instead offering plenty of room to use symbols and metaphors.

I adapted and reconstructed the story from the original dream ideas for the purpose of meaningful self-expression and effective communication. Dreams are excellent resources for interesting storytelling ideas in animation, yet adaptation and reconstruction for these disconnected ideas and scenario fragments is often necessary for audience to access. The narrative structure after
reconstruction in my animation project fits in classic three acts structure and the ‘monomyth’
structure proposed by Campbell (1968). The story in my animation also fits into the ‘feminine’
journey, in which the heroine moves from humility, or even the feeling of humiliation, to self-
affirmation. In my animation project, I used multiple visual styles as narrative devices to convey
moods and symbolic meanings and to represent a dream-like quality. The simple narrative
structure is advantageous when trying to integrate multiple visual styles and bizarre scenarios
derived from dreams to form a meaningful story.

_Millennium Actress_ (2001), a feature length Japanese animation, was used as a case study for its
dream-like quality. Notions in both psychoanalytic and biological theories of dreaming provide
accounts to study the dream-like quality in this animation. I used multiple visual styles with
hybrid aesthetics between 2D hand drawn and 3D computer animation to achieve a similar
dream-like quality in my animation.

### 6.3 hybrid aesthetics between 2D and 3D

A hybrid aesthetic is achieved in my animation through the visual referencing of traditional
2D line and cel animations and the production using 3D computer techniques. With this hybrid
aesthetic, multiple visual styles were developed in 3D computer process to represent a dream-
like quality in my project.

The visual styles in my animation can be placed in the continuum model of animation aesthetic
proposed by Furniss (1998) at the location between mimesis and abstraction. The visual appearance
of my animation does not resemble the real world but transforms the real world objects into iconic
visual elements. These iconic visual elements represent human and animal characters but are not
just abstract geometrical shapes and colours moving with music. In another aesthetic model
proposed by Wells (1998), my animation can be seen as a _developmental animation_ because it
presents multiple visual styles in a narrative content. In regard to the emerging aesthetics of 3D
computer, the three notions of animation, realism, simulation and hybridity inform the creation
of my animation project.

The visual referencing of 2D line and cel animations and the aesthetic judgment were based on
my professional experience and personal interests. UPA’s animations especially _Gerald McBoing
Boing_ and Japanese anime are the two major sources I referenced, because both of them are
produced to express story ideas with stylised imagery and somewhat simplified processes. Other
than these two major sources, I am also inspired by other traditional animations such as works of
National Film board of Canada and Quay brothers’ animations. I also compared my work to 3D
Toward a hybrid aesthetic

computer animations with 2D graphical styles such as student works in SUPINFUCOM or TV commercials produced by PSYOP.

The character and environmental designs follow the stylised and iconic principles in the animations I referenced. The character design in this animation is significantly influenced by anime. The design of environmental backgrounds is the iconic transformation of images in my home country. Lines, shapes and colour are the major concerns in the design and production processes, because the animation is rendered in 2D graphical images.

Concepts in animation studies and film production were also considered when I developed the visual elements for storytelling in the storyboarding stage. Disney’s animation principles and narrative strategies significantly influenced my creation of visual ideas and character performances. The notions in regard to shot-to-shot and scene-to-scene relations in film production such as montage are applied in my project to create visual impact and to tell a story.

6.4 Flexibility and efficiency in production process

With the decision to create the hybrid aesthetic and 2D graphical styles in this animation, 3D production processes are significantly simplified and the workflow becomes more flexible. The simplicity and flexibility also make possible the creation of multiple visual styles that allow the animation to demonstrate a dream-like quality.

3D computer processes are significantly simplified with the 2D graphical representation in this animation. Lighting is totally removed from the production pipeline. Texturing is simplified by omitting the concerns of the complex properties of surfaces needed to simulate the physical accuracy. The concern of the texturing is moved to the colour, lines, shapes of objects, and the overall composition of frames. Modelling is also simplified by omitting detailed topology of characters. Rendering time is also considerably reduced with the graphical styles. Rigging and animating processes are not different from the two processes in conventional 3D pipeline.

Two significant advantages in production with 3D computer techniques over 2D hand-drawn are the reusability of 3D models and the freedom of camera movement. I took these two advantages and applied them in my production. Models of characters were reused in different scenes while colours and textures on characters were modified according to the specific mood of the scene. The movement of camera is only subtly used in this project to focus on the composition of two-dimensional graphical styles.

A more flexible production of 3D computer animation was managed through the use of 2D
graphical representation in this project. The flexible production flow I used is shown in Figure 31. The flexibility is achieved by the efficiency in modelling, texturing and rendering, as well as the flexible animating process. This project is produced in a scene-by-scene base with multiple experimental visual styles in different scenes. This is different from the conventional pipeline in 3D computer animation workflow. The flexibility is significant to the notion of self-expression in 3D computer animation projects, because it allows greater exploration to be conducted during the whole production process.

A set of strategies and a set of visual ideas to create hybrid aesthetics between 3D computer and 2D graphics is proposed in the last section of Chapter 5. These strategies and visual ideas can be further applied in my future productions and also be of benefit to animators and artists who intend to create 2D graphical styles with 3D computer techniques.

6.5 Recommendation and further research

The implication for further inquiries and practices based on this project can proceed in three directions. Firstly, studies on mind processes beyond dreaming can be further investigated to see if these theories inform storytelling for animation production. For example, further exploration can be made regarding the question of how scientific theories of perception and cognition might inform storytelling and artistic perception in animation. Also, animation as a special media can be produced to represent other special states of mind such as memory or altered states of consciousness.

Secondly, more possibilities of hybrid aesthetics can be explored, based on this research. The Realistically rendered 3D images can also be considered for use in combination with 2D graphical images for the expression of specific ideas and to achieve a further hybridity. For example, characters with realistic appearance can be placed in 2D graphical environments to show that they are in imaginary worlds. The hybridity of realistic and graphical images can be further explored through proper story ideas as future projects.

Thirdly, cooperation with experts in computer science or information technology will promote on the development of techniques and production processes. The creation of effects and specific visual appearance is sometimes limited by the functions of 3D computer software. Cooperation with experts in other areas helps to expand the expression of ideas and creation of visual styles.

To summarize this research journey, I have established a conceptual and practical framework through the practice of Sophie’s Secret project. The research model established in this project can be applied to other practice-based researches that are centred on the production of a moving
image project. The self-reflection and reflexivity of art creation in this research contributes to human experiences. The strategies used to create hybrid aesthetics between 2D and 3D, and specific visual ideas developed in this project can be further explored and applied by me in my future projects, or by individuals and small production studios interested in creating 2D graphical styles with 3D computer processes. The efficient, flexible production processes explored in this research benefits computer graphic artists who intend to express their concept and narrative ideas in the form of 3D computer animation.
References

Documents


Toward a hybrid aesthetic


Toward a hybrid aesthetic


Lasseter, J 1987, ‘Principles of traditional animation applied to 3D computer animation’, *Computer graphics*, vol. 21, no. 4, pp. 35-44.


Toward a hybrid aesthetic

Noble, I & Bestley, R 2005, Visual research: an introduction to research methodologies in graphic design, AVA, London.


---- 2001, Anime essentials: every thing a fan needs to know, Stone Bridge Press, Berkeley, Calif.


Robbins, PR 2005, The psychology of dreams, McFarland, Jefferson, NC.


Toward a hybrid aesthetic


**Films**

*8 1/2* 1963, directed by Fellini, F, Cinevic and Francinex, Italy

*A little Routine* 1994, directed by Griffin, G, USA.

*Alphabet* 1968, directed by Lynch, D, Pennsylvania Academy of Fine Arts, USA.

*Beowulf* 2007, directed by Zemeckis, R, ImageMovers, USA

*Birthday Boy* 2004, directed by Park, S, Australia Film Television and Radio School, Australia.

*Cosmic Zoom* 1968, directed by Szasz, E, National Film Board of Canada, Canada.

*Dreams* 1990, directed by Kurosawa, A, Warner Bros. Pictures, USA.

*Even in Dreams* 2007, directed by Taylor, A, France.
Toward a hybrid aesthetic

*Hen Hop* 1942, directed by McLaren, N, National Film Board of Canada, Canada.

*Horton Hears a Who* 2008, directed by Hayward, J and Martino, S, Blue Sky Studios, USA.

*Immortel ad Vitam* 2004, directed by Bilal, E, Téléma, France.

*In the Rough* 2004, directed by Taylor, P, Blur Studio, USA.

*Father and Daughter* 2000, directed by Dudok de Wit, M, CinéTé Filmproductie BV, France.

*Final Fantasy: the Spirit With In* 2001, directed by Sakaguchi, H, Chris Lee Productions and Square Company, USA.

*Finding Nemo* 2003, directed by Stanton, A and Unkrich, L, Pixar Animation Studios, USA.

*Foster’s Home for Imaginary Friends* 2004-, Cartoon Network, USA.

*Gas Planet* 1992, directed by Darnell, E, Pacific Data Images, USA.

*Gerald McBoing Boing* 1950, directed by Cannon, R, United Production of America, USA.


*King Kong* 2005, directed by Jackson, P, Big Primate Pictures and Universal Pictures, USA.

*Le Processus* 2001, directed by Grammaticopoulos, P, SUPINFOCOM, France.


*Lorenzo* 2004, directed by Gabriel, M, Walt Disney Pictures, USA.

*Luxo Jr.* 1986, directed by Lasseter, J, Pixar Animation Studios, USA.

*Madagascar* 2005, directed by Darnell, E and McGrath, T, DreamWorks, USA.


*Mindscape* 1976, directed by Drouin, J, National Film Board of Canada, Canada.

Neighbors 1952, directed by McLaren, N, National Film Board of Canada, Canada.

Open Season 2006, directed by Allers, R, Culton, J and Stacchi, A, Sony Pictures Animation, USA.

Outside In 2004, directed by Chang, Y, Rochester Institute of Technology, USA.

Ryan 2004, directed by Landreth, C, National Film Board of Canada, Canada.


Rooty Toot Toot 1951, directed by Hubley, J, United Production of America, USA.

Scanner Darkly 2006, directed by Linklater, R, Warner Independent Pictures, USA.

Sin City 2005, directed by Miller, F, Rodriguez, R and Tarantino, Q, Dimension Films, USA.

Snow White and the Seven Dwarfs 1937, directed by Hand, D, Walt Disney Production, USA.

Solomon Grundy 2005, directed by Seward, K and Myers, C, Savannah College of Art and Design, USA.

South Park 1997-, Comedy Central, USA.

Spirited Away 2004, directed by Miyazaki, H, Studio Ghibli, Japan.

Star Wars 1977, directed by Lucas, G, Lucasfilm, USA.

Street 1976, directed by Leaf, C, National Film Board of Canada, Canada.

Tale of Tales 1979, directed by Norstein, Y, Soyumultfilm, Russia.

The Great Cognito 1982, directed by Vinton, W, USA.

The Lion King 1994, directed by Allers, R and Minkoff, R, Walt Disney Feature Animation, USA.

The Lords of the Rings Trilogy 2001-2003, directed by Jackson, P, New Line Cinema, USA.

The Man with the Beautiful Eyes 1999, directed by Hodgson, J, Sherbet, UK.


The Passenger 2006, directed by Jones, C, Australia.

The Phantom Museum 2003, directed by Quay, S and Quay, T, Animate!, UK.
Toward a hybrid aesthetic


*The Prince of Egypt* 1998, directed by Chapman, B, Hickner, S and Wells, S, DreamWorks SKG, USA

*The Simpsons* 1989-, 20th Century Fox Television.

*The Three Caballeros* 1944, directed by Ferguson, N, Walt Disney Pictures, USA.

*Toy Story* 1995, directed by Lasseter, J, Pixar Animation Studios, USA.

*Walking Life* 2001, directed by Linklater, R, Fox Searchlight Pictures, USA.

*Wallace & Gromit in the Curse of the Were-Rabbit* 2005, directed by Box, S and Park, N, Ardman Animations, UK.

*Your Face* 1987, directed by Plympton, B, USA.
### Appendix A: scripts

**Original Script Written in 2002**

**Scriptwriting for Animation**  
Yen-Jung Chang  
2/6/2002  
A dream

<table>
<thead>
<tr>
<th>Action</th>
<th>Sound</th>
</tr>
</thead>
<tbody>
<tr>
<td>A girl with long hair and glasses walks on a road of countryside alone.</td>
<td>Wind sound, Footsteps sound</td>
</tr>
</tbody>
</table>
| She meets a worm that comes from the opposite direction. The worm jumps up and penetrates into the girl’s body. | Intensive music  
Sound of worm penetrating, loud girl’s scream, |
| The girl is walking in a crowd of city quickly.  
She looks nervous. She turns her head and eyes continuously looking at other people with scared eyes and keeps walking. | Same Intensive music-low, noise of people, traffic  
Sound effect of turning head  
Intensive music stops |
| In a dim room the girl talks with two worms on a bed joyfully.  
Someone knocks the door.  
The two worms soon jump and penetrate into her body. The girl lies down on the bed and pretends that she is sleeping. | Soft music, low talking sound, chuckle  
Loud sound of knocking door  
Sound of worm penetrating, thud  
Soft music stops |
| The girl peeps from a crack between a door and its frame into a room.  
In the room a man and a woman are talking with worms. | Sound of talking  
Loud noise, joyful songs are sung in unison  
All sounds fades down |
| Thousands of worms gather on a roof of a house. They sing a song together with excitement.  
The scene zooms in and stops with a close-up of a worm. The worm is with long hair and glasses. | |
Final script for Sophie’s Secret

Scene 1
1. A girl with school uniform walks on a road of suburb alone.
2. She meets a worm that comes from the opposite direction.
3. The girl bends down and looks at the worm.
4. A red dot shows up, pulse with heart beat sound, and then transform into a shape of heart.
5. The worm shows a happy expression.
6. The worm jumps up and penetrates into the girl’s body.
7. The girl stands straight panting with a hole on her chest.
8. The girl looks around nervously, swiftly pulls her coat to cover the hole and walks away. Fade out.

Scene 2
9. The girl walks while the scene of countryside fades and the scene of city shows up. She walks quickly a crowd of people with one of her hands holding on her coat.
10. She turns her head and eyes continuously looking at other people with a nervous expression.
11. All the street and the other people’s figures disappear but only eyes float on the air and keep looking at her. Eyes become larger and transform in strange shapes.
12. Close-up of the girl’s terrified expression.
13. The girl runs away with panic and bumps with a person; the street returns to a normal look, and then smears into blurriness while the camera follows the girl.
14. The girl takes a deep breath in front of a door, and then open it.

Scene 3
15. In a dining room, the girl eats dinner with two pigs. Pigs talks loudly while the girl eats quietly.
16. The girl finishes her meal and walks away.

Scene 4
17. In a room with weak light the girl talks with a worm on a bed joyfully.
18. Someone knocks the door.
19. The worm soon jumps and penetrates into her body.
20. The girl lies down on the bed and pretends that she is sleeping. Door is opened and then closed.

Scene 5
21. The girl peeps from a seam of a door into a room.
22. In the room, two pigs look at each other. Two worms stretched out from their bodies tangled together.
23. A close-up shows the girl’s expression. The whole image whirls and fades.

**Scene 6**
24. Many worms with different colors gather on a roof of a house. They sing a song together and dance excitedly.
25. The camera zooms in and stops with a close-up of a worm. The worm is with the girl’s uniform.
26. The girl wakes up with a terrified expression.
27. The girl looks up to the window.
28. Moon is shining and stars twinkling
29. A close-up shows the girl’s smiling.

**Scene 7**
30. Camera pulls back. The background of room fades out and a scene on top of a building shows up. The girl is sitting on the roof.
31. She put her hand into the hole of her body and takes out the worm.
32. Close up of the worm. A pair of wings unfolds from the sides of the worm and starts flapping
33. The worm flies up with the girl grasping on its tail.
Appendix B: storyboard
Toward a hybrid aesthetic
Appendix C: samples of reflective journal
Toward a hybrid aesthetic
Appendix

Some thoughts:

1. Flickering EX in peeking scene
2. Mcdonald looking in 1st scene
3. Wood-cut black and white for 2nd scene
4. UPA in indoor
5. Room scene - what style?
6. Dream scene can have some move
7. Wake up - woodcut
8. Wiggle for all words and metaphor
9. Blend shape for whole body -> break consistency
10. Slow motion / dissolve
11. Distortion tea
12. Imperfection - use hair to hair
   phenomenon
   @ still stuck in character design

+6/6
Toward a hybrid aesthetic
Appendix

• crease line - back creases off

Art Nouveau

• simulation for 6.27.29

- increase max self collide iterations
decrease time to rest

- set to 10

b/12 Toon line flickering - blur
- 2x size, then shrink
- how does it look on FCP

S -> wall line random

White map - noise on offset

Modeling: billy thyme - yellow

Flower: blummon - fragrant, luxuriat

Sophie a wijson
Appendix

Silk worm

The cycle of the silk worm.

Next Fri: 11 Feb
0. the meaning of worm - worm hole
no another world.

Artistic research

0. River Row, Doubt High
Contextualizing artistic research - Hannah, MD
0. The definition - It’s a combination of artistic practice and theoretical approach while aiming at the production of knowledge
0. The balance between artistic practice & theoretical strategy is like negotiating
0. not only observation but also practice
0. maximum openness and clarity, who researches, and why I what is being researched.
0. method should remain flexible and evolve over time.

Is artistic research a meaningful concept? Naively, not.

p. 70. "Subjective" artistic research can be "subjective" be used to be "test" or "experiment"

0. In artistic research, the term "happen" in a singular & interpretative mode instead in a general & exact mode.
Toward a hybrid aesthetic

1. Leadership and innovation, transfer research skills and knowledge to economic, societal, and cultural foci.

2. Development - economic, social, and cultural foci.

3. Research students - lack of technique, leadership, creativity, problem solving.

4. What is your potential? What does your research knowledge enable you to do?