
FROM IDEATION TO SCULPTURE
DIGITAL SCULPTING AS THE PRIMARY
'IDEATION' TOOL FOR CREATURE DESIGN

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Terms and Definitions

Auto-retopology, (Autopo) – if a polygonal mesh has become distorted through extreme manipulation of its points during the sculpting process, some software packages have the function to automatically recalculate efficient topology of a mesh without having to manually recreate it. The purpose is to make the digital sculpting process more expedient by taking away from the technical constraints of the digital sculpting process and keeping focus on the creative.

‘Blue sky’ ideation – the formation of ideas with little preconception of a goal or an outcome.

Digital sculpture – a means of manipulating digital clay made up of polygons within a computer to create sculptures for illustration and 3D printing (Chopine 2011, pp.71-72).

Concept art – illustrations that are created to depict an idea for visual development to convey characters, creatures, environments, vehicles and other products or props for films and games (Murdock & Allen, E. 2006, p. 16).

Concept Sculpting – The process of digitally sculpting a concept without using pre-made concept art to develop creatures or characters directly within a digital sculpting software package (Slick 2011, para. 4).

Thumbnail generation – a very loose or rough small sketch to establish the initial formation of an idea to depict its design, often using traditional mediums such as pencils, charcoal, pens and paper (Chopine, 2011, p. 119).

Pareidolia – a phenomenon where an individual can perceive figurative imagery where the stimulus is in fact vague and abstract.

3D modeller – a person whose role is to create three-dimensional models in a 3D software package, often replicating two-dimensional illustrations into three dimensions, by moving points, curves and polygons within a computer (Ketchum, 2014 para. 1-3).

Sub division levels – Three-dimensional objects made in a modelling software package are made up of simple polygonal meshes, which can appear faceted. Their appearance can be smoothed out by multiplying the number of polygons known as sub-dividing, in order to give them a more natural looking appearance. The higher the number of times a model is sub-divided, (known as the levels) the larger the number of polygons will make up the model and the more detail can be applied to it, without distortion. There are various mathematical equations that different software packages apply to do this (Chopine, 2011, p.31).

Topology - the arrangement and flow of points, edges and polygons of a 3D model, in order to support efficient digital sculpting and animation (Chopine, 2011, p.58).

Abstract

Traditionally, there has been a large divide between the roles of conceptual artists and of 3D modellers for the creation of character and creature art within the entertainment sectors. Despite the availability of technology in these industries to create the imagery required, early ideation and conceptual visualisation of ideas are often explored through traditional mediums such as pen and paper. Recent developments in digital sculpture such as automated redistribution of polygons have the potential to blur the boundaries between these roles possibly even converging them.

The purpose of this research is to explore and frame how digital sculpture can be implemented as the primary conceptual development and design tool for the ‘blue sky’ ideation of fictitious creatures. ‘Blue sky’ ideation for the purposes of this study can be defined as the digital sculpting of a character or creature with little or no direction, relying on spontaneity and imagination to conceptualise and design ideas.

Through a series of experimental practice-led research cycles, multiple methodological frameworks are explored with the aim of identifying a methodology for creating ‘3D sculpted sketches’ for the initial phases of the ideation process. A 3D sketching methodology for ideating creature designs is presented, which responds to and encourages spontaneity and flow in a digital sculpting environment. This research project acknowledges that drawing still remains the predominant method of visualising design ideas for characters and creatures for many artists. Alongside other ideation techniques, digital sculpting can function as a rapid and responsive tool to visualise and explore forms in a digital sculpting environment for the conceptualisation of multiple creature design variations for an emerging digital sculptor.

The results of this study are significant for emerging digital sculptors who may not necessarily have a well-defined creative brief or initial concept. By way of example, through the creative practice, this exegesis provides a theoretical framework for others to apply to their own ideation process in a digital sculpting environment without having to use drawing as their primary ideation tool.

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Statement of Original Authorship

The work contained in this thesis has not been previously submitted to meet requirements for an award at this or any other higher education institution. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made.

QUT Verified Signature

Signature:

Date: 8/1/15

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Chapter 1: Introduction

This practice-led research project examined methods for conceptualising digital creatures and characters using digital sculpting tools. The aim of this investigation was to validate the use of digital sculpting in place of traditional creative practices of ideation through drawing. The study challenges the notion put forward by the *Core Skills Of VFX Skillset* (2011) handbook that stresses reliance upon traditional drawing in the pre-production stage of visual effects production (Skillset 2011, p.15). As this exegesis and associated practice will show, drawing is not the only valid process for the conceptualisation of digital creatures. Rather, digital sculpting can provide new opportunities for iterative conceptual development in a 3D virtual space.

The research presents methods for ideating design variations of digitally sculpted creatures and characters directly in a digital sculpting software application. Among some other approaches, a method of layering strokes in the early process of developing a digital sculpture was of particular significance. Varying the intensity of these strokes during almost any part of the digital sculpting process, design variations could be efficiently created in order to help enhance the flow, spontaneity and improvisation of the practitioner. Csikszentmihalyi (1996, p. 110) defines flow as a feeling of enjoyment of the process where “things were going so well as an almost automatic, effortless, yet highly focused state of consciousness”.

As an emerging digital sculptor, I wanted to explore methodologies that facilitate the formation and exploration of my ideas as ‘3D sketches’. This study considers the potential of resisting traditional drawing as the primary conceptualisation method for ‘blue sky’ ideation to formulate and discover ideas. The context of ‘blue sky’ ideation for this study is where a clear idea or objective is not present in the mind of an emerging digital sculptor. However, the motivation to create concepts for creatures or characters within a digital sculpting software environment exists, in order to enhance their sculpting practice further. This study proposes a framework where a creative goal may not be clearly defined, but the motivation to digitally sculpt is present.

The Core Skills Of VFX Handbook Skillset (2011) states, “the best VFX tool is paper” (Skillset 2011, p.15). The text justifies this by stating that this way of working facilitates the composing of the ideas in an environment free from technological burdens and constraints. From the drawing, any issues or complications can be dissected, addressed and expedited without having to deal with these problems in production. Diving directly into the technology to design and visualise a concept, one can easily become lost in the software’s functionality without a clear conceptual objective (Skillset, 2001, p.15).

These statements contradict my own practice and beliefs as an artist as I have never found drawing to be the most effective tool for idea generation. This study, therefore challenges the notion that drawing is the most effective and efficient method of ideation. There is some support for my stance such as in *The Core Skills Of VFX Handbook* (2011), as it does concede, “There’s no one correct approach to VFX problems - just ones that may be more efficient than others.” (Skillset, 2011, p.15), This paragraph closes with a question “Can you draw?” (Skillset, 2011, p.15). We can all draw to some degree, but the figurative level of drawing that I possessed at this time was not one that I felt effectively realised my ideas.

This body of practice-led research expands the knowledge base of aspiring digital sculptors within clearly delineated cycles of creative practice. The body of research presented in this exegesis demonstrates practical procedures that can be used to generate ideas directly within a digital sculpting software application.

Concept Sculpting

Digital sculpting technology has permeated many industries, but its earliest origins lay in engineering and industrial design, in particular the automotive industry. The automotive industries became great proponents of developing and incorporating computer-aided industrial design into their process (Lavigne, 1998, paras. 1-2). Many other technologies used in the entertainment industry have also been re-appropriated from other industries, such as motion control camera rigs for live action visual effects shots and 3D printing applications for prosthetic makeup and suits whose roots both lie in precision of manufacturing technologies (Friedman, 2009).

Pickthall (2012, para. 6) states that, in the entertainment industry, drawn concept art plays an extensive role in the production process. The purpose is to visually express ideas to evoke a sense of atmosphere and story to the character, environment or vehicle, and facilitate the rapid exploration and visual communication of ideas. It does not have to stipulate the precise ‘look’ of this vision right from its inception. It is merely a catalyst to inspire debate and decision-making on the look of the final element/s for production. Pickthall (2012, paras. 3 & 15) identifies the motivation for concept art as a means of conceptual visualisation, exploration and communication.

Concept art is often known for highly polished illustrations; however, the artistic faults of coarse, loose sketches are often ignored if they are appealing enough to inspire and excite (Pickthall, 2012, paras. 11 & 17). Indeed, what at first appears as a fault or looseness in these sketches could be the start of a new direction that was not right for a production. All of these loose drawings (even the little awkward sketches) are an intrinsic part of the overall conceptual process. (See figure 1.1 for an overview of the process of a concept artist Nichols (2010). Identifying the right look for a production in the ‘concepting’ phase from the first sketch is quite rare, making this process of conception and ideation highly iterative. Additionally, concept art also provides an effective method for conveying the vision of a production to financial backers (Pickthall, 2012, para. 12).

Table 1.1 Summary of the process of concept artist by Adam Nichols, 2010.

Jonson (2005) states that sketching is a standard practice for many creative practitioners. Concept artists typically create many small drawings called “thumbnail” sketches that allow the rapid exploration and communication of ideas. This allows stakeholders such as executives and production leads to make decisions about how to further progress the creative vision for a project. These images are then expanded upon and refined before being given to a 3D modeller to transfer into a three dimensional digital model.

Skillset (2011, p.58) advises that within many mainstream production facilities, a two-dimensional concept artist will regularly hand approved artwork over (see figure

1.2) to a 3D digital sculptor. A digital sculptor uses these images as reference to accurately replicate the original concept art in 3D. Guessing what these entities look like from different angles can prove to be creatively challenging, as there is not always a definitive direction, which leaves the scope open for individual interpretation.

Figure 1.2. Two-dimensional concept artist drawing by Getty 2008.

The proliferation of digital sculpting technology has now presented 3D modellers with the possibility that they can expand their role in a production pipeline. The role of the 3D modeller has now developed into more than what was once confined to just a technical master, pushing points and polygons around in a 3D software environment to replicate ideas from the drawings of concept artists. A 3D modeller

now has the potential to become a creative and conceptual force in the early phases of conceptualising a project's vision, rather than being just a technician.

Slick (2011) acknowledges that accomplished two-dimensional concept artists were able to create polished character/creature designs more rapidly than 3D modellers. However, dramatic improvements in digital sculpting technology over the last couple of years have drastically challenged this as contemporary digital sculpting methods now facilitate the rapid creation of 3D thumbnails and digital maquettes. Scott Patton was one of the earliest proponents of digital sculpture to produce concept art (Slick, 2011 para. 4). Figure 1.3 below shows an example of Patton's work:

Figure 1.3. Digitally sculpted character concept art by Patton 2008, p. 10.

Slick (2011, para. 5) presents a list of advantages to creating creature concepts directly in a digital sculpting software platform. Working directly in 3D to sculpt creature concepts reduces the difficulties of precisely translating an idea from two-dimensional to three-dimensional. The two-dimensional art often only presents one angle, which can obscure the information needed to create the creature in three-dimensions, leaving a lot left to the interpretation of the three-dimensional modeller. Editing and changes to the 3D concept can be performed in real time, so production leads can immediately see how they affect the entire design and concept from any angle. A concept can be rendered out from several camera angles and lighting variations are relatively simple to set up and render. A character can be easily duplicated and various versions with different poses can be created from a single sculpt. Concept sculptures can be passed onto three-dimensional ‘pre-visualisation’ artists to compose shots for movies and video game cinematics, early in production. In the past many highly skilled traditional concept artists could create compelling imagery more efficiently than a digital sculptor.

Polygons stretch and deform as they are moved in the digital sculpting process, which causes noticeable degradation of the polygons shape and form in the model. (See figure 1.4, left side). To rectify this stretching, polygons would have to be manually redrawn. However, recent technological developments in digital sculpting such as auto-retopology have the potential to make the creation process of digital sculptures a lot more efficient in expediting design concepts (Slick, 2011 paras. 6-7). The stretched polygons can be recalculated in real-time to be composed of more polygons, which reduces any noticeable degradation or irregularities in the surface those previously stretched polygons were producing (see figure 1.4, right side).

Figure 1.4 Left: jagged polygons before auto retopology. Right: After auto retopology, the polygons are recalculated and smoothed out by Pixologic, 2013.

Chapter 2: Contextual review

The computer is a tool that has empowered me to competently visualise my ideas. In my previous work as a motion graphics artist I combined photography and typography in Photoshop and Illustrator to create storyboards. Visualising and communicating ideas with clients and colleagues in this way allowed me to circumvent the weak drawing skills in my practice. I used the software to compose and resolve creative and technical production issues I may not have achieved by just drawing these ideas. Using the computer to overcome these obstacles I engaged with the software as an ideation tool to help facilitate a sense of the spontaneity and flow in my practice, as if I were doing collages to help share my vision.

This research project is concerned with the pre-production conceptual phase of digital characters and creatures. In a typical production process, the pre-production conceptual phase involves the design development of characters or creatures through sketching to help establish and realise the vision of the project (Nichols, 2010).

The following contextual review identifies how the research fits within and disrupts this established process. An examination of the ideation process through sketching is scrutinised as a process for conceptual development. The discussion moves on to digital technologies that have already permeated the production process. The contextual review concludes by showing how it may be possible to circumvent the drawing process by adopting digital sculpting tools earlier in the ideation process.

Conceptual development from simple ideas to complex outcomes has long been undertaken through sketching. Goldschmidt (1991, p. 123-125) declares that sketching is closely related to writing as an everyday activity that most people can undertake, reiterating that drawing is the predominate method used in our culture to communicate and realise those ideas from the mind's eye. Sketching forms a major part of the design process for many practitioners.

Practitioners use sketching in their design process as a means of ‘accumulating’ potential design outcomes (Bilda, Gero, & Purcell 2006, pp. 587-590). From the negative and positive qualities of these drawings can then be distinguished through reflection and discussion. Developing designs, involves conceiving different solutions. The design grows through the modification of previous ideas, therefore making design an iterative process. Due to the abstract nature of sketching, and its often ambiguous outcomes, serve as an exploratory tool. By rapidly sketching numerous iterations of potential designs practitioners can formulate and discover new ideas that were initially vague. This visualisation of ideas is necessary for many practitioners.

Li Yung, Y.Liu, T.Chaung (2010, p.4046) conclude that freehand sketching facilitates the ability to perceive fragments of an idea, as well as establishing the overall concept. Sketching generally uses broad strokes to establish the principal shapes to ideate, moving from simplicity to complexity to establish forms and move the initial sketch into a more finished state. These points are supported in Cook and Agah’s (2009, p. 203) research that breaks down the characteristics of sketching into three components, which include feedback, overdrawing and incremental refinement.

Feedback relates to how in the process of sketching a practitioner can develop an idea to bring it closer to their initial concept or move it into a new direction by correcting the strokes of their drawing. Overdrawing happens as the sketch develops. Shapes can be exaggerated and others understated by building up strokes of the sketch to give it form, also allowing for adjustments. Given the loose nature of this type of drawing, sketching, therefore provides the ability to change and develop at any point given the loose nature of this type of drawing. Incremental refinement uses broad strokes to establish the shapes and form of the sketch. These broad strokes are then refined down to smaller, more detailed contours as the sketch becomes more clearly formulated on paper (Cook & Agah 2009, p. 203). These three facets of drawing explain how and why the characteristics of traditional sketching could be adapted into a method of ideating directly within my own digital sculpting practice.

Throughout the ideation process ideas are ambiguous and vague. Ideas need to be graphically expressed, in a loose fashion to explore ideas and visually communicate concepts for scrutinising and refinement. Thumbnail sketching can help to explore ambiguous ideas. Inspiring further iterations, variations and different conceptual avenues that were not initially considered (Alcaide-Marzal, Diego-Mas, Asensio-Cuesta, and Piqueras-Fizman, 2012, pp. 264 – 270). Many researchers see the practice of freehand sketching as an action of conceptual thinking, deeply entrenched in the pursuit of enhancing and augmenting ideas (Schön and Wiggins, 1992, p. 135). The process of sketching, according to Cook and Agah (2009, p. 203) often occurs early in the conceptual phase where ideas can initially be vague and tacit. The psychological mindset to ideation is often reflected in the sketches themselves leading to often coarse, disordered and chaotic representations of those ideas. However the ability to explore concepts from fragmented ideas is not something that can be done with just sketching. Yeoh, Kok, and Cheow (2002) state that the participants in their study ascertained new and different artistic directions whilst engaging with a computer to perform their creative practice. The explanation for this conclusion is based upon “unintentional discoveries when using the computer, which in turn evoke new responses and stimulate new thinking. It is more than a tool because it helps to make the respondents' minds work and it may therefore enhance their creativity” (Yeoh, Kok and Cheow, 2002, p. ix).

In contrast to the point of view that sketching is a necessity of ideation and conceptual development Bilda, Gero, and Purcell (2006) cited by Alcaide-Marzal, Diego-Mas, Asensio-Cuesta and Piqueras-Fizman, (2012, pp. 266) maintain that freehand sketching is not a necessity in the design process for many designers. They conclude that the resulting work of ‘expert designers’ who do not rely on freehand sketching as a fundamental part of the early conceptual phase of design can still create a logical methodology of idea generation that produce convincing and fulfilling outcomes.

As sketching can only represent a two dimensional depiction of the concept, Salustri (2005, para. 7) disputes drawing as an efficient ideation tool:

To sketch a solution at this point defeats the purpose of ideation because a sketch is limited to the features put on the sketch. The ideas presented here are so abstract that there is no real way to capture its essence visually without making too many other commitments about form (Salustri, 2005, para. 7)

Salustri's opinion supports the pragmatic approach I have taken to develop a 'three-dimensional sketching' methodology in my digital sculpting practice. For most practitioners, sketching is one of the first ingredients of ideation and does have value. However it has its limitations with respect to what digital sculpting technology can now offer as an ideation tool. For example, digital sculpting technology enables exploration of the forms of the model can be explored more efficiently than if drawn; the ability to see the sculpture in multiple angles facilitates design adjustments to be made whilst still within the three-dimensional medium.

Though freehand sketching is a two-dimensional practice, Cook and Agah (2009 p.203) identify that the artist's mental depiction of that idea is much more complex. To draw effectively, artists must consider, the spatial relationships of objects in three dimensions. Cook and Agah (2009, p.203) identify that most input and output hardware for three-dimensional modelling is still two-dimensional. Therefore conceptualising in a three-dimensional space is not that dissimilar from the input tools of traditional sketching, as they are both based around the manipulation of stylus on a flat surface. They conclude, "the computer simply offers an opportunity to make that translation process a more dynamic one" (Cook & Agah, 2009, p.203). However, this opportunity technology presents, depends on the practitioners experience and familiarity with the technology.

The use of contemporary technology as a conceptual ideation design tool is a contentious issue in many circles of industry and research. Stones and Cassidy (2010, p.457) conclude that freehand sketching was more productive than the constraints of software orientated conceptualisation, which is also supported by Goel (1995, p. 212). With the rise of tablet technologies and two-dimensional drawing software, this study takes a strong position against freehand sketching being a more productive ideation tool than using computer software. The objective of this body of research

was to establish a method of practice for the three-dimensional ideation sculpting immediately in a digital sculpting environment within the computer.

Technology offers effective means of drawing and sculpting with a computer. Israele, Wiese, Mateescu, Zollner and Stark (2009, p.462) concedes both free hand drawing and three-dimensional sketching as being pertinent in the initial phases of conceptual ideation depending on the needs and preference of the artist. Cook and Agah (2009, p.201) acknowledge that there has been a reaction to the ‘engineering environments’ from which three-dimensional software was originally derived after. The application of technology to ideate involves the added burden of learning the often-complex tools, which can hinder a practitioner’s ability to efficiently ideate.

Drawing and writing that is taught early on in childhood for many practitioners therefore; the immediacy of drawing and the familiarity of a pencil and paper are sketching’s most beneficial qualities (Miller, Drury & Campbell, 2002, p. 43). According to Won (2001, p. 324), using freehand sketching to ideate does not require the additional and modified reasoning that ideating directly on a computer does. He recognises that one must also know how to use the software, where as pen and paper do not require this added thinking. Therefore, the discourse between ideas and computer provides a more complex method of ideating. In order to address this complexity the ideation process can be broken down into two distinct components; these are preparative and generative. (Lurioi, 2009, p. 28). See figure 4.2.2.

The preparative stage of ideation uses a methodology to focus the array of vague thoughts and ideas, prior to the visualisation of these initial concepts. By focusing these initial impressions, it makes the generation of ideas more expedient, facilitating the generative component by breaking up the ideation process in order to streamline it. The preparative stage is where the design question is defined in order to isolate the key considerations. Thus preventing the internalisation and externalisation of the ideation process occurring at the same time (Lurioi, 2009, p. 29).

In the generative stages of ideation Jonson (2005, p.613) acknowledges that, for many artist, freehand sketching is the primary conceptual instrument in the initial phases of ideation. He examines the ramifications digital technology has on

sketching and concludes that in the digital age, ‘verbalisation’ rather than freehand sketching, was the major conceptual tool for ideation. As a preparative tool Jonson (2005, p.613) states that ‘verbalisation’ can direct the generative stage of the ideation process irrelevant of the tools being used. He goes as far as to state that the computer itself “has emerged as an ideation tool” (Jonson, 2005, p.613). Ng (2011) also supports that ideation can even take place prior to the generative stage of ideation. He uses a matrix to prepare for the generative portion of his ideation process (see figure 4.2.1).

The general consensus from this review of existing literature is that freehand sketching is vital in the design process. However, the technique of Decal Jr (2012) contravenes that position, highlighting an efficient method of ideating within a digital sculpting environment, by an eminent industry practitioner.

The visual effects company behind *Lord of the Rings*, *Avatar* and *the Hobbit* cite that:

Conceptual design at Weta Workshop has been done predominantly in digital form. Long gone are the days when marker pens or pencils (and erasers) were the only tools on the designers' desks. (Wetanz.com, 2012, para. 1)

Film producer John Landau, who often collaborates with James Cameron to produce films, that rely heavily on visual effects) states that three-dimensional modellers generally use technical drawings and concept art as reference for the setting the direction of the concept they are tasked with modelling. He elaborates that convention informs us that artists should not begin formulating a concept directly in three-dimensions. However, digital sculpting technology has evolved to where one can do ideate directly in a three-dimensional sculpting software package. He concludes that “if you're modelling a boat, don't start from a conceptual drawing. Build it in three-dimensions” (Redman, 2014, para. 18).

The opposing view that exist in the discussion on the role sketching plays in the design development process signifies the complexity of the subject matter addressed in this research. This contextual review has examined the role sketching plays in the

ideation process and how alternative approaches to ideation can be applied in a digital sculpting environment.

Sketching is recognised as an important part of the ideation process. However, practitioners embedded within the commercial creation of creatures and characters indicate that digital tools could provide a departure point from traditional drawing for their ideation process. Lurioi (2009) dissects the ideation process into two stages that he describes as preparative and generative. The delineation between the preparative and generative stages of ideation remains in question and how could it be adapted and appropriated into my digital sculpting practice to develop an efficient process of ideation directly in a digital sculpting software platform.

Jonson (2005) endorses ‘verbalisation’ as a valuable preparative tool in the ideation process. In the cycles of practice, Ng’s (2011) framework was used as the inspiration to develop an effective method of focusing ideas as a preparative exercise in order to make the generative component of his practice more productive. Decal Jr (2012) provides the strongest evidence that adopting digital sculpting tools earlier into the ideation process to side step traditional sketching can yield fruitful results.

Chapter 3: Methodology

Introduction

The theoretical outline and contextual perspective established in the previous chapter provides a valuable lens with which to approach the research. Subsequently, it is necessary to address the mechanics of the research methodology in order to establish an effective structure to document the research and its findings.

The foundation of this research project was built around four cycles of practice. These cycles were based on the issues that were exposed in each previous cycle of practice. Each one developed and informed the direction the following cycle of research would take.

The inaugural cycle concentrated on examining the problematic aspects of my practice. My reflection of these issues helped to understand the needs of my practice and formulate what the research needed to address. The following cycle addressed the preparative needs of a digital sculptor, with the aim of ideating directly in a digital software platform in order to narrow the gamut of ideas and focus the generative stage of ideation. The third cycle of practice addressed a method of generating ideas directly in a digital sculpting tool in order to develop the generative ideation of my practice. Then the final cycle consolidated these findings.

Practice-led methodology

This practice-led research project used methods of investigation commonly associated with reflective practice. Gray (1996, p.3) defines practice-led research as:

Research which is initiated in practice, where questions, problems, challenges are identified and formed by the needs of practice and practitioners, and secondly, that the research strategy is carried out through practice, using predominantly methodologies and specific methods familiar to us as practitioners (Gray, 1996, p.3)

Gray (1996, p.3) also explains that practice-led research methodologies have the capacity to examine and advance one's practice through relevant structures, procedures and reflection. This understanding of the nature of practice-led research influenced the design of the research process, which adopted action research cycles as its primary method.

Action Research

A series of action research cycles involving stages of planning, action and reflection were used to reveal otherwise tacit knowledge ingrained in my practice. Schön (1983) supports the dynamism and unpredictable nature of creative practice, stating that:

competent practitioners usually know more than they can say. They exhibit a kind of knowing in practice, most of which is tacit...practitioners themselves often reveal a capacity for reflection on their intuitive knowing in the midst of action and sometimes use this capacity to cope with the unique, uncertain, and conflicted situations of practice (Schön 1983, pp.viii-ix)

According to Candy (2006, p.1), practice-led research “often falls within the general area of action research” Therefore, this study adopted the action research cycles presented by Koshy (2005) as the primary approach, (see table 3.1 and 3.2 below).

Table 3.1 The action research spiral by Koshy, 2005, p.4.

Table 3.2 An action research cycle by Koshy, 2005, p.9.

Table 3.2 inspired the first cycle and was used as a means of “reflection and analysis of current practice”(Koshy 2005, p.9). It became the foundation of the research to identify the fissures and issues in my current practice. The following series of cycles could not be fully planned from the inception of the study, as they would be led by the reflection and issues my practice encountered during each cycle. By using a series of reflective cycles I could consolidate and reflect on individual issues as they arose in my practice.

The methodology of the research is practice-led using action research cycles, the method of the study was to sculpt and journal or record my work for critical reflection. This method is based upon the issues recognised in the previous cycles included keenly observing other key practitioner’s techniques and ideologies. Scrutinising their processes and outcomes provided capacity for me to extrapolate variations and constituents of their workflows to assist in remedying the problematic facets identified in the previous cycles of my practice.

Reflective practice

This research project presents an insight into the reflective practice Schön discusses, which is involved within my digital sculpting process. Schön (1983) defines ‘reflective practice’ as “the capacity to reflect on action so as to engage in a process

of continuous learning” (Schön in Atherton, 2013, para 2). The implementation of reflective practice gives practitioners the platform to:

unite research and practice, thought and action into a framework for inquiry which involves practice, and which acknowledges the particular and special knowledge of the practitioner
(Gray & Malins, 2004, p.22)

The structure of reflecting on my practice I had initially adopted in this body of research (table 3.3) was found to be rigid for my methods of practice.

Table 3.3 Cycle of reflection by Gibbs, 1998, Chapter 4.3.5.

The progression of using action-based cycles of research to propel this investigation lead to many dead ends aborted and looped cycles. The pathway of cycles did not lead into each other as seamlessly as I first imagined. (See the aborted cycles appendix). Denaro (2013) supported this issue of some cycles of research leading nowhere. “It’s nice to have a progression to the cycles, so they lead into one another, as if you were planning everything along the way and it’s all very clean. But the reality is that they can be incredibly random and messy, and often lead backwards and into dead ends. This can be really interesting.” (C. Denaro, personal communication, 12 March 2013).

Wallschlaeger and Busic-Snyder (1992) and Lurioi (2009, p.14) support that a more flexible model can be applied in practical aspects of the research, (see figure 3.4). Not being so focused on planning the series of cycles from the inception of the research helped to let the needs of my practice drive the research. Using reflection to 'listen' and identify those needs. Letting the previous cycles direct the preceding cycles of research as the issues arose in my practice.

Table 3.4 Flexible model of practical research by Wallschlaeger and Busic-Snyder, (1992).

As my practice tends to be very dynamic and spontaneous, it was based around my ingrained tacit knowledge, it could be hard to document my reflections. It was valuable to structure my reflection on action and in action. Kingslien (2012) presents a system he entitles the 'Crit Canvas' as a pragmatic and organised structure for documenting reflection during and after one's artistic practice. I adapted this method of reflection into my research. (See figure 3.5). The 'Crit Canvas' proved to be a useful tool to record and structure my reflections.


I don't like: <ul style="list-style-type: none"> Needs to be posed to convey more emotion. The nose. The peccs 	I like: <ul style="list-style-type: none"> The texturing and painting. The mouth 	The work: 	Specific tasks to improve my work: <p>More speed sculpting less refining a single sculpt.</p>
My weaknesses: <ul style="list-style-type: none"> Anatomy Nose Use of reference Entire body Shapes and rhythm Function morphology 	My strengths: <ul style="list-style-type: none"> Lighting Shape and silhouette exploration. 		Feelings: <p>Need to focus more and cut out distractions.</p> <p>Short attention span.</p>
Patterns I am noticing: <p>Short attention span.</p>		Progress Notes: <p>Tried posing the model when textured but layer caused crash every time.</p>	

Table 3.5 Example of 'Crit Canvas' reflection applied to my practice by Adalian, 2014.

Conclusion

These cycles provided a road map for the research process and helped to link my findings; informing the direction the research would take in the following cycle.

The basis for deducing and quantifying effective, practical strategies to address the issues that arose from my practice were established through reflective analysis of these cycles. Then research was undertaken in order to address the issues identified in my practice. This research was implemented into the following cycle to help inform positive development of my digital sculpting practice.

Reflection in action and on action, as well as external feedback from other digital sculptors, became a vital lens, through which I could rationalise where the friction and fissures lay in my practice. This produced the data I required to focus my subsequent research in each of the cycles.

Chapter 4: Cycles of Practice

4.1 Cycle 1 - 'Ad libitum'

Introduction

As a practice-led research project my research began with critical reflection on my own practice with the aim of identifying questions and assumptions that were already ingrained in my practice. The following cycle of practice was developed as a direct response to this initial starting point and is presented here in this exegesis in the action research phases of planning, action and reflection.

Plan

I chose to analyse my workflow at the time from both a conceptual and technical standpoint, reflecting upon that work to inform the direction of the research in the following cycle.

Action

An 'Ad libitum' approach was applied to most of the sculpting during this cycle of practice. Upon reflection I recognised that I had used this approach for most of the digital sculpting I had done in my digital sculpting practice prior to this research. Lurioi (2009) affirms "conceptual art is a spontaneous exploration that helps the designer to establish a relationship with the character while seeking for insights." (Lurioi, 2009 p.33).

Within my practice, I let the sculpture manifest its form during the sculpting process without any initial direction, a form of conceptual exploration. As an emerging practitioner, it gave me the freedom to experiment and learn the processes and workflows of digital sculpture, up to a point. Upon reflection, I observed several negative aspects to this way of working.

Reflection

Aside from several technical naiveties on my part and the prolonged time I would have to invest in the ideation of my sculpting practice, I noticed a distinct conceptual

niche I had unconsciously become caught in. There was a tendency for my experimental practice to result in sculptures of emaciated old men, (see figures 4.7 - 4.11).

Beiman (2007 p.5) and Lurioi (2009 p.8) validate that conceptual aspect of character design is a much tougher task when there are no limitations present to help focus the creative decision making process. This was an issue (amongst others) that became one of the cruxes of investigation in this study. How to broaden one's conceptual and ideational span? These characters were based on humanistic features with little exploration or risk taking.

I observed an overwhelming creative block in the form of negative, self-criticism with regard to the quality of my work. This was an important, yet confronting, aspect of this study. I had a lot of self-doubt about the outcomes of my sculpting practice on many levels. I could perceive this was causing a lot of restriction in my work. Internally, I perceived my practice was riddled with insecurities. The insecurities that had come to the surface made the strokes I was taking tight, rigid and over analysed, labouring over small things that were hindering my progression. The conceptual tendency to create emaciated old males in my sculpting practice may have, amongst other things, been a manifestation of these issues. I felt that in order to really make the most of this research opportunity (above all other aspects that I had observed in my reflection), this negativity would have to be addressed.

Pressfeild (2002) refers to the insecurities and negativities I was experiencing as 'resistance'. This was a term that sat with me a lot more comfortably than the labels of insecurity and negativity, as they have such strong, unpleasant connotations. Through the work of Pressfeild (2002), I could rationalise these feelings of 'resistance', as a natural part of being an artist. For a long time these issues had caused a creative friction in my artistic decision-making, a recurring battle on the creative front. Pressfeild (2002) compares the warrior and artist's battles. "The warrior and the artist live by the same code of necessity, which dictates that the battle must be fought anew every day" (Pressfeild, 2002, p.14).

It did not make the issues in my practice vanish. However, it made me conscious of them so I was more mentally prepared to deal with these issues when they arose. Learning to observe them, move on and most significantly realise that it was I who gave these emotions, their power. As Pressfeild (2002) states:

Resistance has no strength of its own. Every ounce of juice it possesses comes from us. We feed it with power by our fear of it. Master that fear and we conquer resistance (Pressfeild, 2002, p.16)

I had to deal with these issues of resistance in my practice for some time, but becoming more mindful of them and realising their purpose was a leap forward for my practice. This mindset was not a simple issue to address. It was deep and profound. Rather than embracing these feelings about my practice, I intended to understand their origins and their purpose better. I later discovered that it is about embracing the mistakes; letting them happen and using them, or changing focus if something does not work.

In order to address the issue of my conceptual stagnation, I decided to no longer use base meshes (pre-existing forms, such as a human bust, with little to no detail) as the departure point for a sculpture. I observed that using the same base mesh repeatedly was one of the reasons I was encountering this recurrent issue. Using a base mesh also took away from the originality of my intention of 'blue sky' ideation, as I was building on someone else's initial idea

Another limitation I was grappling with, compounding my ability to move beyond my conceptual stagnation, was my limited knowledge of anatomy. It was a slow learning curve, but the investigation into anatomy became an invaluable component in the development of my sculpting practice. The study of anatomy in sculpture, both traditional and digital, is paramount., providing the architecture to make all manner of creatures plausible. It helps support an audience's suspension of disbelief, providing a level of credibility to what they are seeing. By considering the environment the creature inhabits and, how its anatomy would evolve for that makes them feel tangible and believable. By using human and animal anatomy as the basis

for developing the anatomy of a creature sculpture to the needs of the design; a sense of plausible anatomy can be shaped into all manner of strange, yet believable beings.

To really move my sculpting forward, the use of anatomical and conceptual reference was something I would have to adapt into my work in a much more rigorous structured fashion than I had been doing in my sculpting practice. iPad apps called ‘L’Ecorche’ and ‘Mara 3D’, became invaluable reference tools as they showed the anatomical planes of the body in an accessible way that I could translate in my digital sculpting practice. The use of reference material to inform my sculpting not only assist with resolving anatomical considerations, but can also serve to inspire during ideation of a character or creature.

Summary

My ideation process needed structure. ‘Blue sky’ ideation was challenging without an established direction. Ideation needed some constraints and focus in my practice. A set of parameters to help define the direction of the digital sculpting session I undertook would be beneficial.

I discovered ‘resistance’ and that it was a natural part of my creative practice, which other practitioners also struggled with. The kind of ‘blue sky’ ideation I yearned for, was unrealistic considering my ability at the time. I did not have the internal capacity to blue sky ideate in the way the masters of digital sculpting, such as Patton and Spencer could do with ease, as their experience allowed that freedom.

A poor grasp of anatomical knowledge, along with the unproductive use of reference imagery, was also a factor that was building ‘resistance’ and frustration in my digital sculpting practice.

I became aware when sculpting that it was important to create volumes and not lines when digital sculpting. I understood about primary forms, but my secondary forms were lines and not volumes. Sculpting differs from drawing, as it is the volumes of the sculpture that create highlights and shadows. It is also the same for drawing, but the artist has to use imagination and memory to create the illusion of shadows.

See figures 4.1 & 4.2 as well as appendix two for example outcomes from the first cycle of practice:

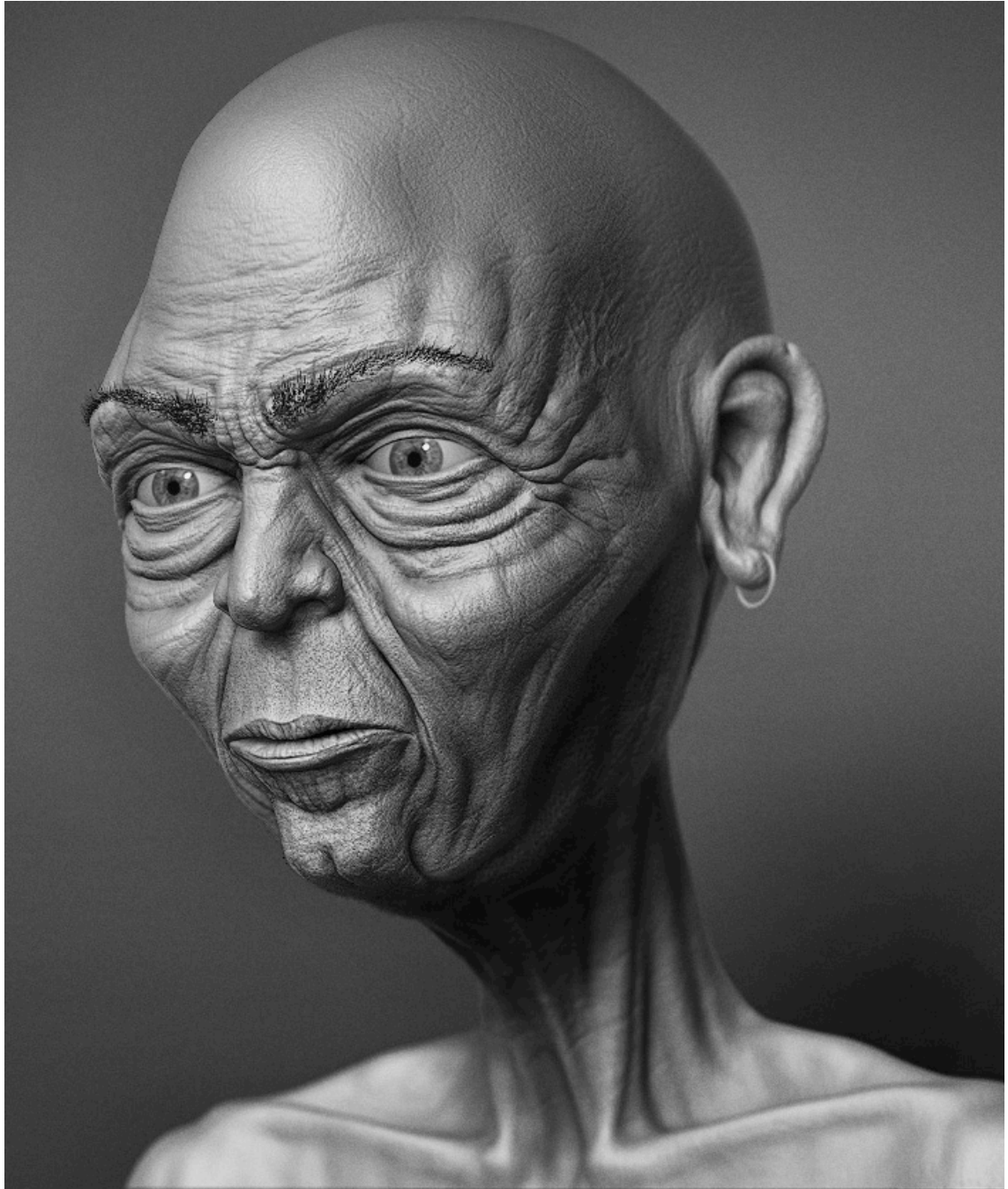


Figure 4.1 Cycle one example outcome of practice by Adalian, 2011.



Figure 4.2 Cycle one example outcome of practice by Adalian, 2011

4.2 Cycle 2 – ‘Preparative Ideation Chart’

Introduction

The previous cycle pinpointed several issues in my digital sculpting practice that needed to be addressed in order to help develop my ideation process to be more fluid and dynamic. I found that ‘blue sky’ ideation was restrictive in my practice, as there were no clear parameters to create within. My ideation process needed focus and direction.

Plan

From this reflection, I thought it was prudent to investigate a means of formulating and guiding my ideation process to give it more focus and purpose. The plan was to develop a method of documenting a concept or idea without drawing, but to also serve as a source of stimulating a clear direction for my digital sculpting practice.

Action

Before I proceeded on to the second cycle of my practice, I thought it important to acquaint myself with the title of the research to make sure I was not deviating from what I set out to achieve. The part of the title I had not considered was the distinction between characters and creatures. Spencer (2012, p.4) cites the consideration of creature verses character as a significant consideration to be mindful of when using digital clay to conceptualise a design idea. He states that a character has “drives and emotion. A creature is more of a monster or an animal the viewer cannot relate to” (Spencer, 2012, p.4). It is imperative that we convey these internal dissimilarities as exterior qualities. By understanding the how the internal motivations affected the external look of a creature I could rationalise how the anatomy, myology and physiology of the sculpture had to serve a function and purpose to help communicate to the audience.

One of the main advantages that sketching has over concept sculpting is that one’s ideas are transferred into a tangible form. I observed that using the ‘Ad Libitum’ method led to a jumble of ideas fighting for clarity and prominence. This confusion was slowing my practice down and adding resistance. Spencer’s delineation between

characters and creatures led me to structure my ideas to reduce the resistance I was experiencing to provide me with a clear framework for each concept sculpture.. This verbal differentiation began to resonate with Jonson’s (2005) belief that ‘verbalisation’ is a key conceptual tool. Beiman (2007) identifies that “by narrowing the focus (using story constraints, names and descriptions as a framework), a set of limitations is created that become ‘liberations’” (Beiman, 2007, p.8). He observed that developing character designs in a contextual framework of a story, for example, provides more significant outcomes.

Bancroft (2007, p.16) and Lurioi (2009, p.10) also assert that having defined constraints provides a foundation to decide on how the design is going to convey what is required. The realisation that my creative process required a more methodical approach led me to start writing back stories for the characters to help refine my conceptual jumble of ideas. This method became quite stifling as it took more time than I was comfortable with. I began to research frameworks for structuring one’s ideas in order to help accelerate the visualisation of the characters and creatures within my practice.

A presentation on the design process of concept artist Kai Ng (2011) divulged that he uses a method of charting his concept before starting to draw. This is where ideation takes place in order to assemble the idea from many disparate thoughts and influences and provide focus and purpose without the need for sketching (see table 4.2.1).

Table 4.2.1 Concept art design process (slide 18) by Ng (2011).

This method of ideation provided a framework where I could systemically question the world the character inhabits. The physicality that is required to survive that habitat, the character's backstory and motivations, etc., before I started the sculpting process.

Dedecker (2011) states, "the most important step of the process of character modelling and sculpting is the preparation and understanding of what needs to be accomplished" (Dedecker, 2011, p.82). Preparing a clear goal was something that was difficult for me to do when working in a 'blue sky' creative context. Ng's (2011) framework proved to be an effective method in my practice of engaging this kind of thinking.

The work of McLaughlin (2005, p.2) had some resonance with this method of ideation. He stated "the process of systematically asking questions and then categorising the answers performs two beneficial functions: issues are eliminated, and issues are recognised" "McLaughlin labelled this process a "taxonomy of digital creatures". He stated that "digital creatures have their own taxonomy" (McLaughlin, 2005, p. 2). Here, taxonomy refers to categorising based on specific characteristics. In this case it is based on that of biological species.

Reflection

I adapted Ng's (2011) methodology of ideation to adapt it into my practice. His chart was designed particularly for the ideation of robotic characters. As a foundation for these changes, I adapted the elements of design described by Debreceni (2009, p30-31). He poses questions assessing character physiology and body types, which can be heavily influenced by the habitats these creatures have evolved within. Further to these questions, there is inquisition into character qualities, both external and internal. Lurioi (2009, p.13) advises that character archetypes can be a valuable source to identify a character's internal motivations that can influence the 'look'.

Over several sculpting sessions, I continually refined my concept chart to allow for the ideation of a broader range of concepts. The incorporation of various character archetypes, crypto-zoological influences, environments, name ideas, body shapes, an

area for additional notes, back story and motivations helped to make my version of the concept chart more in depth.

Iterating and refining the chart through critical reflection led to what became an effective structure to facilitate my ideation process without relying on drawing. I did not intend to use the concept chart as a rigid framework to base my sculptures around. The concept chart was a conceptual guideline that could be dynamically developed during the sculpting sessions if necessary. This allowed for some room to 'Ad lib' and ideate within my practice too, (see figure 4.2.7 for the current iteration of the 'concept chart'). Lurioi (2009, p. 28) uses the diagram (figure 4.2.2) to structure the process of developing a concept for a character, distinguishing two distinct stages in his process: preparative and generative.

Table 4.2.2 Character design process model by Lurioi (2009, p.28).

Lurioi (2009) structures the next preparative point as the research phase, where reference is gathered to assist in developing knowledge and inspiration to inform the first of the generative stages that precedes the ideation phase.

The use of reference is an important part of sculpting creatures that are grounded in some sense of reality, using imagery generally sourced from the Internet, to help understand and clearly perceive what it was I had to achieve in digital clay. Through critical reflection, I observed a tendency to now be over reliant on anatomical

reference. I also found that this reliance on anatomy led to stagnation in the sculptures I was making. The majority of my sculptures seemed to be bipedal human-esque body shapes with strange heads attached to them. I observed that I was getting a recurrence of my issue of ‘conceptual stagnation’ again in my practice, something that I wanted to distance myself from.

The outcomes of my practice still felt derivative. Spencer (2012, p.4) declares “breaking expectations” to be a valuable component to ponder when developing a concept sculpt. By understanding proportion, shape, form, composition, anatomy, light, etc one can depart from these norms of conventional guidelines to various degrees, depending on the needs of the idea. Reference imagery is important to help reconcile the anatomy of the creatures in my practice. I reframed the way in which I would use reference imagery. I would use it in a lot looser fashion, not to replicate, but to guide.

My ability to perceive the reference material and transfer what I was seeing onto my sculpture was challenging. Breaking the reference image into basic shapes and planes helped to overcome this issue. Experimenting with the ‘Median’ filter in Photoshop helped remove some of the detail from the original image to help assist me to see the anatomical planes in the reference more clearly. This was in order to apply it to the blocking of anatomy in my sculpting practice. (See figures 4.2.3 & 4.2.4).

Figure 4.2.3 by Jeffries, 2010.

Figure 4.2.4 by Jeffries, 2010, with ‘Median’ filter.

Summary

I had not perceived the differentiation between preparative and generative phases of ideation prior to this research. This delineation led to the understanding that ‘verbalisation’ could be a valuable preparatory ideation tool for my practice. This understanding enabled me to direct my digital sculpting sessions. The ‘preparative ideation chart’ would always be a work in progress, based on the needs of my practice and the projects I engage with. Using a tool to focus and guide my digital sculpting practice helped to stem the ‘resistance’ that had been emerging in my work. Concentrating on the preparative ideation phase of my practice led me to consider the needs of the generative component of the ideation process, which I undertook in the following cycle.

Figure 4.2.5 – 4.2.7 represent a sample outcomes from the second cycle of practice and the relevant iteration of the supplementary ‘preparative ideation chart’. See appendix three for further examples.

CONCEPT CHART V10		SELECTED:									
BODY TYPE/FEATURES	ECTOMORPH	MESOMORPH	ENDOMORPH	AGE	ENVIRONMENT	SEX	POSE/RHYTHMS	PROPS	SKIN/TEETH	NOTES:-	
Biped Quadrapped	Thin Small bones Flat chest Youthful look Light muscles little body fat Tail	Broad shoulders Narrow waist Mature look Strong Large chest Long torso Thick skin	Soft body (fat) Round shape Round face Short neck Low muscles	Old Middle aged Young	Nocturnal No air Jungle Mountain Cave/Underground Sky Volcanic Urban	Male Female Androgenous	Slouched Upright Walking	Shoes Clothing Jewellery Gun/s Knife/s Armour	Scars Fur Feathers Bad teeth Sharp teeth Goofy teeth	BACKSTORY: A tribal initiation ceremony for the young males. PROPORTIONS: Agile, elongated arms and legs for running and climbing distances MOTIVATIONS: To intimidate his rivals COLOURS/TEXTURES/SHAPES/FORMS Tribal NAME IDEAS: CRYPTOZOOLOGICAL/ANIMAL INFLUENCES: Tusks VISUAL REFERENCE & RESEARCH AVENUES: Maasai, South American tribes and rituals.	
<u>MOBILITY</u>	<u>WALK</u>	<u>SWIM</u>	<u>SLIDE</u>	<u>CLIMB</u>	<u>GUIDE</u>	<u>DIG</u>	<u>WHEELS</u>	<u>FLOATS</u>	<u>TELEPORT</u>		
<u>TYPE OF CHARACTER</u>	<u>REPTILE</u>	<u>HUMANOID</u>	<u>INSECTOID</u>	<u>MECHANICAL</u>	<u>EXTRA TERRESTRIAL</u>	<u>AQUATIC</u>	<u>EARTH BOUND</u>	<u>AMPHIBIAN</u>	<u>AVAIAN (BRID)</u>		
<u>PERSONALITY / ATTITUDES</u>	<u>AGGRESSIVE</u> <u>PEACEFUL</u>	<u>DISTANT</u> <u>WARM</u>	<u>ASSERTIVE</u> <u>PASSIVE</u>	<u>DECIVER</u> <u>HONEST</u>	<u>DEPRESSED</u> <u>MANIC</u>	<u>FUNNY</u> <u>SERIOUS</u>	<u>INSANE</u> <u>SANE</u>	<u>EXTROVERT</u> <u>INTROVERT</u>	<u>ADVANCED</u> <u>BACKWARD</u>		
<u>CHARACTER ARCHETYPE</u>	<u>PROTAGONIST</u>	<u>ANATAGONIST</u>	<u>REASON</u>	<u>EMOTION</u>	<u>SKEPTIC</u>	<u>SIDEKICK</u>	<u>GUARDIAN</u>	<u>CONTAGONIST</u>	<u>SOLDIER</u>		
<u>SYMBOLIC ARCHETYPE</u>	<u>LIGHT VS. DARK</u>	<u>WATER VS. DESERT</u>	<u>HEAVEN VS. HELL</u>	<u>MAGIC</u> <u>WEAPON</u>	<u>WISDOM VS.</u> <u>STUPIDITY</u>	<u>SUPER</u> <u>NATURAL</u>	<u>FIRE VS. ICE</u>	<u>INNER BATTLE</u>	<u>THE HUNTED/ER</u>		
<u>SITUATIONAL ARCHETYPE</u>	<u>THE QUEST /</u> <u>THE TASK / THE</u> <u>JOURNEY</u>	<u>THE INITIATION</u>	<u>THE FALL</u>	<u>DEATH/REBIRTH</u>	<u>NATURE VS.</u> <u>MECHANICAL</u> <u>WORLD</u>	<u>GOOD VS. EVIL</u>	<u>THE UNHEALABLE</u> <u>WOUND</u>	<u>THE RITUAL</u>	<u>THE WATCHER</u>		

Table 4.2.5 the tenth (current) iteration of the ‘preparative ideation chart’ and the accompanying sculptures, (overleaf) by Adalian, 2012.

Figures 4.2.6 and 4.2.7 illustrate the outcomes of my sculpting practice for second cycle, using the tenth iteration of the ‘preparative ideation chart’ by Adalian, 2012.



4.3 Cycle 3 – ‘Layer Ideation’

Introduction

The preparatory ideation needs of my practice were addressed in the previous cycle, which led me to consider the generative constituent of my practice. This cycle would become a substantial component of my research and radically impact my practice.

A method of ‘dynamically sculpting thumbnails’ directly in a digital sculpting environment using a variation of layer intensities within the software combined with the phenomena of ‘pareidolia’ (finding figurative imagery in the abstract) augmented this process to identify tangible forms and shapes. These forms could then be sculpted into a figurative state.

Plan

The intention was to engage with the research to investigate a method of generative ideation that effectively circumvented sketching as the primary ideation tool, yet embraced the qualities of sketching to facilitate digital sculpting as the main instrument for ideating creatures or characters. I researched how other practitioners who use digital sculpture as an ideation tool to execute their sculpting practice without relying heavily on sketching.

Action

There was still some trepidation in my sculpting practice, slowing me down and creating internal negative resistance. My need to lay down the perfect stroke each time was intruding on my progress. I was becoming overly reliant on the undo function when I was sculpting, hindering my creative momentum. This perfectionist mentality to ideating contravened what Cook and Agah (2009, p.201) describe as the “rough, messy and dis-organised” characteristics of traditional sketching. These qualities are inherent in sketching, as they represent the manifestation and outcomes of one’s cognitive process, which can often be chaotic and loose. The connection between the cognitive process and sketching can be dissected into three constituents feedback, overdrawing and incremental refinement. According to Cook and Agah (2009, p.202) feedback happens during the action of sketching.

as a sketch is drawn, the artist continually sees the results of each stroke of the pencil, and reinterprets the visual image on the page, comparing it with his or her mental concept. While the artist can make corrections to the sketch to bring it closer to his or her mental image, he or she can also use those differences to update the mental image, trying new concepts or fleshing out areas that were not yet concrete. (Cook and Agah, 2009, p.202)

This evaluation of each stroke had become over magnified in my practice prior to this cycle. The strokes I was making on the sculpture were not equating to the concept I had perceived.

The second of the three constituents that Cook and Agah (2009) referenced called ‘overdrawing’ is when

the artist gradually adds new marks over previously drawn lines, building up and emphasising some elements of a sketch while de-emphasising others.... It is overdrawing that gives sketches their characteristic sketchy appearance, and allows the artist to change the drawing just as feedback changes his or her mental image. (Cook & Agah, 2009, p.202)

In this cycle of research I was looking for a way in which I could emphasise some strokes and reduce the intensity of others retrospectively. Yet still augments the sculpture with new strokes in order to develop designs and discover new directions that feedback and overdrawing facilitate in traditional sketching.

Cook & Agah (2009, p.202) define the last of these three components called ‘incremental refinement’ as the approach of going from macro to micro:

As the sketch progresses the artist begins with simple shapes and broad ideas, which are then refined through experimentation and exploration into more concrete and detailed descriptions. (Cook and Agah, 2009, p.202)

Rather than diving straight into the details of a concept, it was important I research a framework that would support this methodology of starting my ideation process within the digital sculpting platform working from broad strokes. These broad strokes could be refined down to smaller more detailed aspects of the concept later in the ideation process.

As these intrinsic components of sketching provided a proven method of ideation, I aimed to incorporate feedback, overdrawing and incremental refinement into my ideation process within a digital sculpting environment. Retrospectively reducing or intensifying the strokes I had made in my digital sculpting practice helped to address the aim of incorporating feedback, overdrawing and incremental refinement into my practice. The approach I took was to start with broad strokes to quickly establish the forms of the sculpted thumbnail. Developing it further working from macro to micro and placing key strokes or groups of strokes on separate layers. The ability to retrospectively go in and adjust the layers that had recorded these strokes as well as augment them, facilitated overdrawing in a digital sculpting platform. Feedback was based on my judgment of these strokes and the changes I made to them on the layers. I could evaluate each stroke and easily adjust its intensity to change the forms of the sculpture. This method of ideation became a very powerful conceptual exploration tool in my practice. It lightened the burden of the perfectionist I had towards my sculpting.

Decal Jr's lecture (2012) identified a technique focused on "forward momentum", something that was sporadic in my practice, that encapsulated feedback, overdrawing and incremental refinement. In his lecture, Decal Jr (2012) cites this technique as a means of developing character designs in digital sculpting software using layers to create multiple design variations (thumbnails). Once I had done a thumbnail, this method enabled me to go back into the layer and adjust the intensity of the strokes that I had used to create the sculpture until I was happy with the forms and shapes.

Using iterations of layer intensities enabled me to quickly create rough variations of the model, which facilitated a dynamic method of conceptualisation. Whether it was

a big strong stroke that drastically changed the model or a subtle, delicate stroke, I could go in and alter its intensity and adjust them if required (see figure 4.3.1).

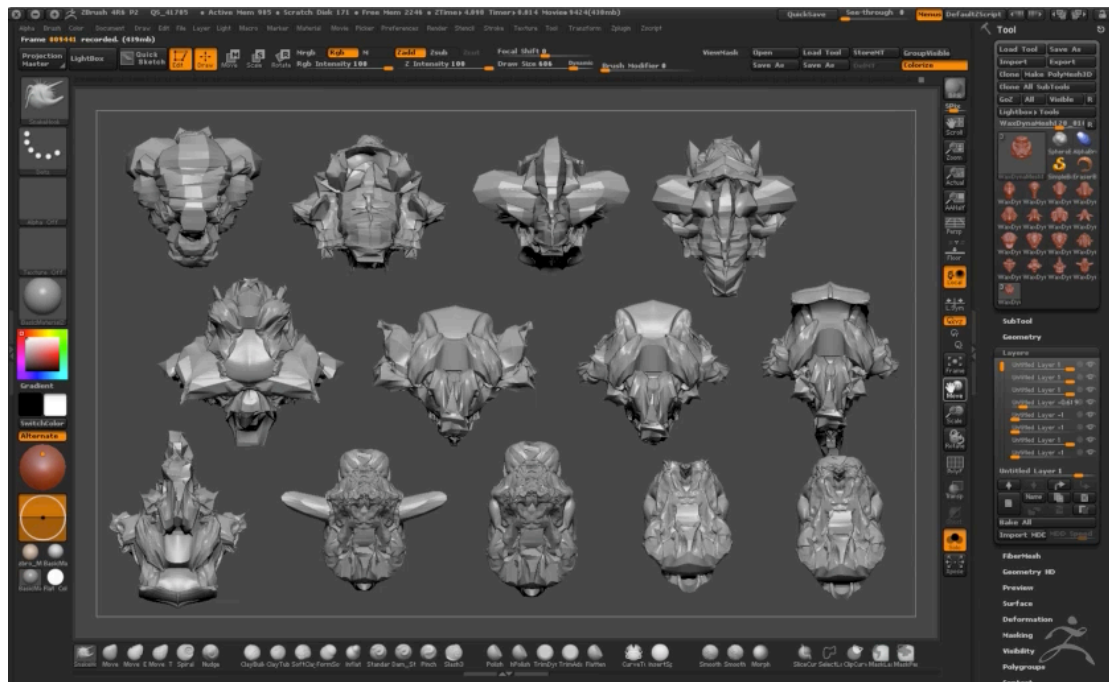


Figure 4.3.1 see attached USB drive for video of varying layer intensities to create thumbnails by Adalian, 2012.

This technique of ‘layer ideation’ led me to embrace the setbacks in my work, freeing me from a very restrained way of sculpting. Dynamically searching for the forms that felt right, rather than getting it correct straight away, loosened my whole approach to the ideation process. This method led to a method of ideating without over thinking it. This enabled me to embrace the possibilities of chance to discover designs that I would have not conceived prior to this. Kurt Papstein (2012) also employs this method of using layers to find shapes to ‘push the concept’ of a digital sculpture to “really extreme effect, and come up with wild stuff” (Papstein, 2012, para. 2).

Presenting variations and different directions were another valuable aspect of this method of ideation. In a lecture the renowned creature designer Neville Page (2014) explains that presenting a variety of ideas is important in the design process to help identify the right and wrong directions for a project. Mixing and altering the intensities of these layers in both positive and negative directions, facilitates a

method for visualising differences by thumbnail generation of a variety of ideas directly in a digital sculpting environment.

Manipulating the intensity of the strokes on various layers, both early in the sculpting process and on lower subdivisions when the sculpt is almost complete, provides a non-linear method of 'blocking in' (defining the broad shapes and forms of an idea – incremental refinement) early in the process and then possibly further into in the sculpting process if further variation is required. When altering the intensities of these layers and analysing their qualities, I applied the theory of 'pareidolia' to resolve some of the abstract outcomes of this process. Pareidolia can be defined as the discovery through observation of figurative elements in highly abstract artefacts such as clouds, paint splatters, etc.

I had unknowingly used 'pareidolia' in an early aborted ideation method I had tested as an avenue of the research process looking at abstract symmetry drawings (see appendix one). Pareidolia can be a tacit phenomenon that this study makes explicit to assist emerging digital sculptors with the discovery of ideas for creatures or characters in abstract forms. At the '3D Printer World Expo', Krichevsky (2014) demonstrated using 'pareidolia' by randomly carving into a digital clay sphere and finding the figurative forms of the idea. He developed a digital creature sculpture from this foundation, squinting his eyes to help see the forms.

I also re-appropriated the technique used in figure 4.2.4 to use the 'Median' filter on the thumbnails in Photoshop to reduce the detail of the thumbnails. This process was done in order to assist me to perceive the highlights and planes to help find eye sockets, mouths, ears major wrinkle forms and the placement of horns or hair. An example of this method used in my practice can be seen in figures 4.3.2 and 4.3.3. Rotating the thumbnails in three-dimensional space within the digital sculpting software often helped to find more appealing figurative forms. Sometimes the side of the sculpture facing away from the viewport presented interesting opportunities that I had not perceived from the original view that I had sculpted the thumbnail.

The volume of thumbnails produced was often important, as there were some cases where the thumbnails were discarded. This was because they did not present a strong

creative direction or, in comparison to the other thumbnails, were too time-consuming to resolve compared to the other thumbnails.

Reflection

Augmented with this layering technique, the identification of figurative forms relevant to the brief proved a potent means of ideating directly in ‘digital clay’ without a reliance on drawing to first establish a variety of ideas. This enabled me to find the shapes of the sculpture first, (without being too mindful of anatomy), letting design be the focus. Searching for the internal figurative forms in the thumbnail generation process and developing a plausible anatomical structure to the sculpture led to more creative outcomes within my practice. The process results in a way to iterate many different versions of a thumbnail sculpture.

From reflecting on my practice I observed a sense of ‘flow’ by using this process. It did, however, lead to some self-indulgence due to a tendency to stumble across an effective design solution in my practice. With more experience and understanding of shape design, composition to propel the direction of my sculpting sessions this method would be even more expedient.

I identified in my first cycle of practice that I needed to avoid using the same base mesh to ideate from, but I could potentially even start with a base mesh and radically move away from its original form to create something totally different. I was excited by the fact the more layers I used the wilder the potential results, but it was harder to predict the outcomes of this method at times. Requiring more time to find the sculpture’s figurative forms through applying ‘pareidolia’.

Upon reflection I concluded that this technique was a useful ideation method for generating interesting base meshes that could be refined and developed. I also found that this technique could be applied at any part of the sculpting process to help push the concept of a sculpture further, if needed (see figure 4.3.7). This approach to ideating directly within a digital sculpting environment focuses on the discovery and exploration of the shape language and their relationships to light and shadow.

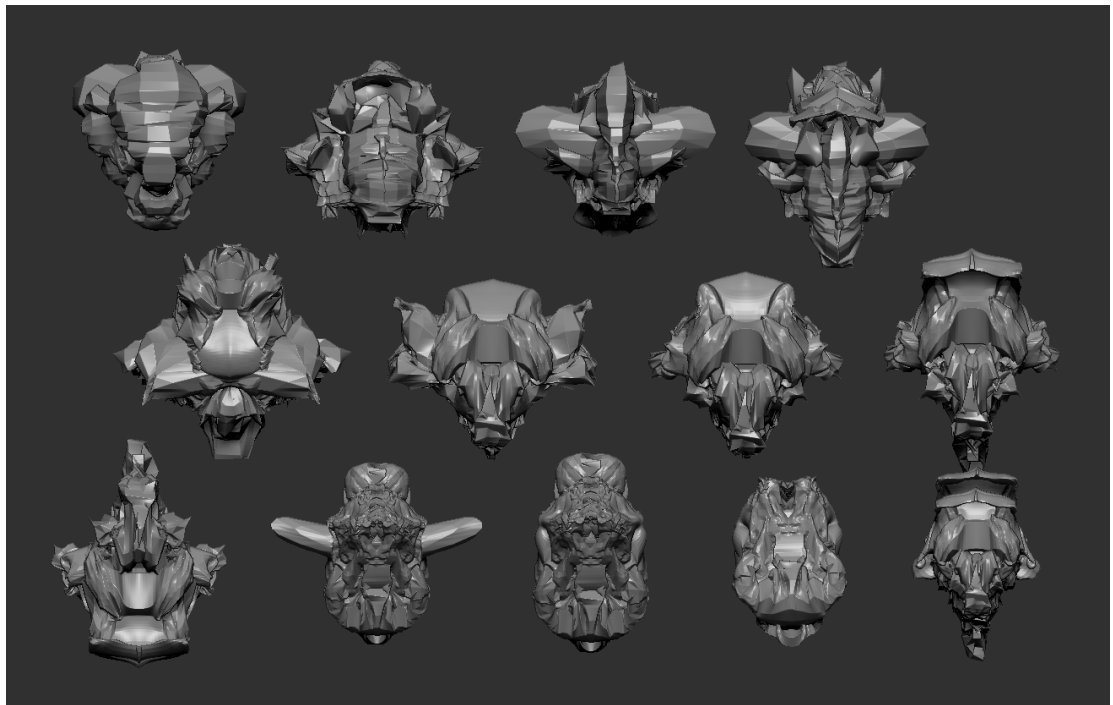


Figure 4.3.2. The original sculpted thumbnails by Adalian, 2013.

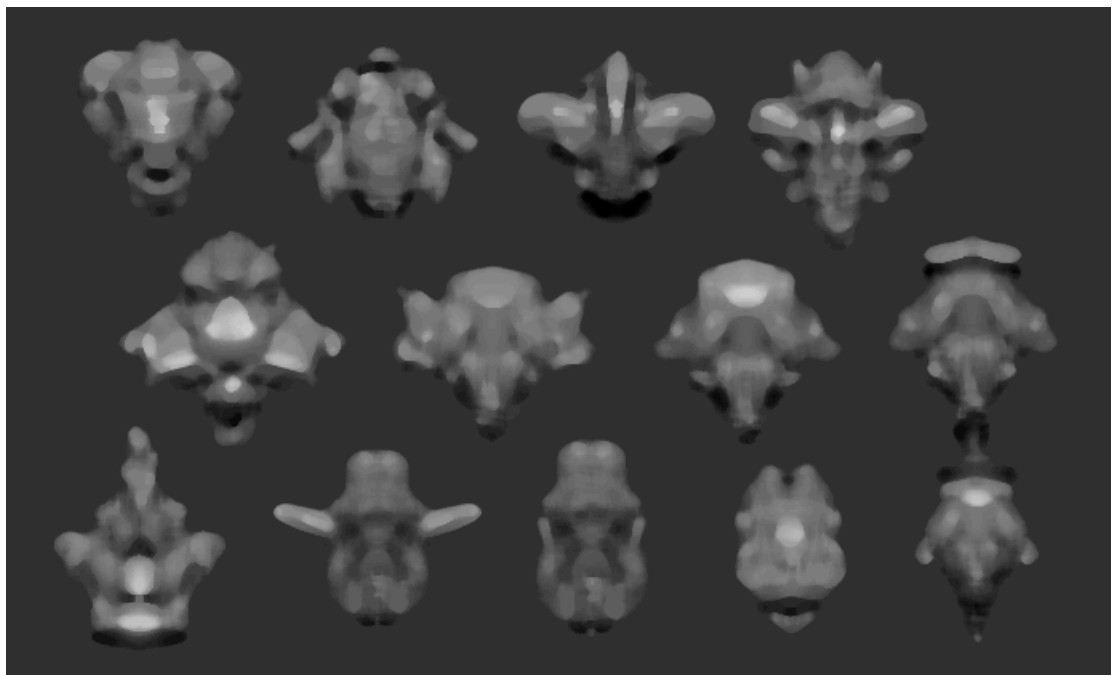


Figure 4.3.3. The sculpted thumbnails with the Median filter in Photoshop applied to reduce detail to help see highlights and opportunities to place the eyes, mouth, ears, wrinkles and other character defining elements by Adalian, 2013.

Summary

This cycle of the study presented a generative method of ideation for the formation of ideas immediately within a digital sculpting software package that was valid for my practice as an emerging digital creature sculptor. These approaches to ideation within the digital sculpting medium led me to abandon the perfectionist mentality I had in my sculpting practice to embrace the freedom of the ideation process. The reduction of this burden further eased the ‘resistance’ I had been experiencing earlier in my practice. Mistakes became a valuable part of my ideation process. It even led to some valid unanticipated outcomes in my digital sculpting.

The ‘layer ideation’ outcomes were occasionally hard to foresee and could be perceived to be abstract in their appearance. Applying ‘pareidolia’ in the form of reducing the detail of the thumbnails to see mainly their highlights and lowlights led to a simple method of deciding where features could be placed. The design of the thumbnails further developed, by discovering figurative forms in abstract thumbnails.

I did observe that it was important to be mindful of the number of layers used to work with this method fluidly. Too many layers proved a little overwhelming, as they were hard to organise and manage at times. Naming each layer also helped to streamline the workflow, see figure 4.3.4.

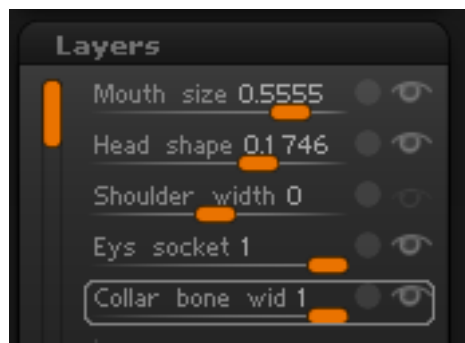


Figure 4.3.4 layer naming conventions for expedient workflow by Adalian 2013.

The application and experimentation of the ‘layer ideation’ technique was initially applied at the beginning of my sculpting sessions. As I became more familiar with the process, I attempted to see what the implications of applying this method would be later in the sculpting process. The ‘layer ideation’ technique turned out to be a valid source of making large and small scale adjustments to the sculpture at both the

generative ideation stage and further into the sculpting process. This technique allowed for adjustments to be made based on feedback or to create variations of the sculpture, as well as to develop a digital sculpture further if necessary.

Figures 4.3.5 to figure 4.3.13 below illustrate the outcomes from the third cycle of practice.

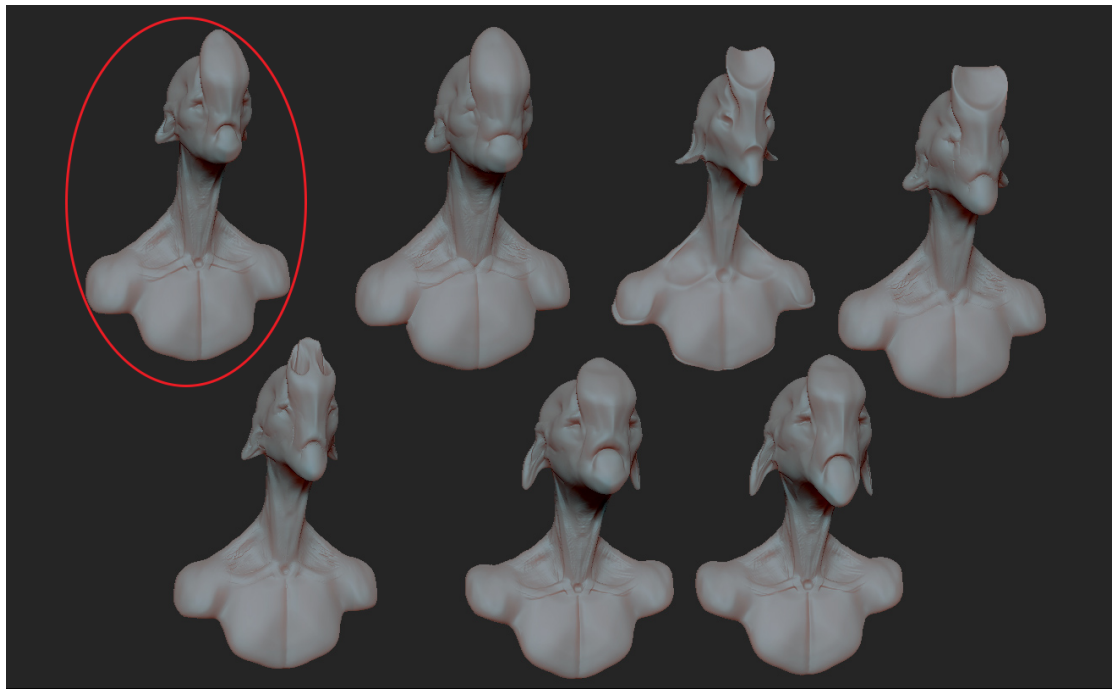


Figure 4.3.5. Thumbnail generation technique that led to the sculpture shown in figure 4.3.3. (The thumbnail circled in red was the basis for this sculpture) by Adalian, 2012.

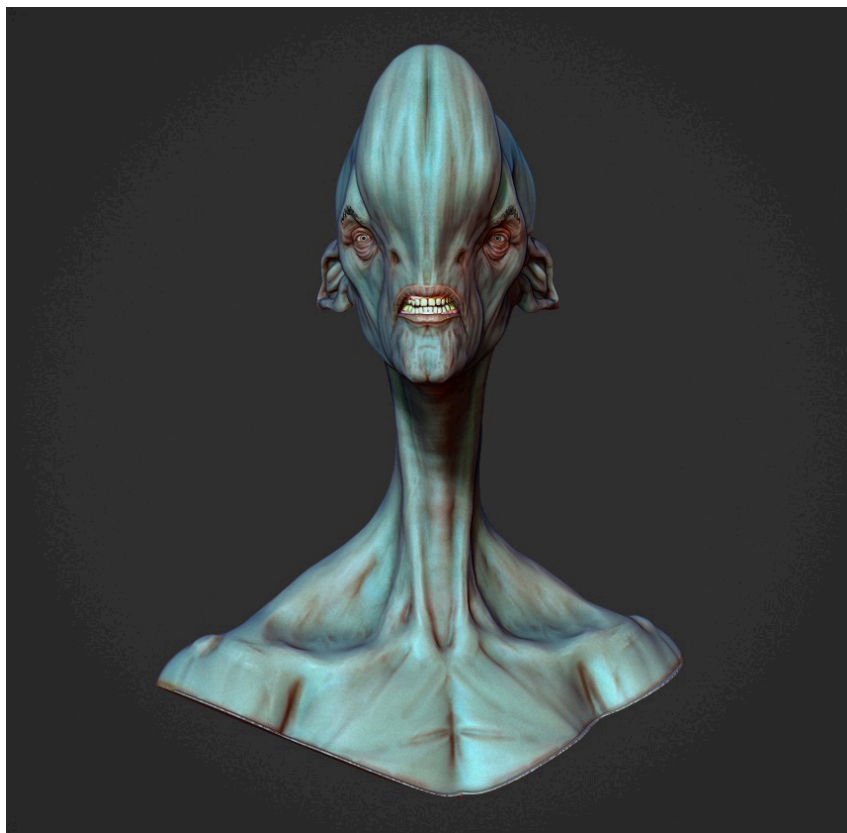


Figure 4.3.6. Cycle three example outcome of practice by Adalian, 2012.

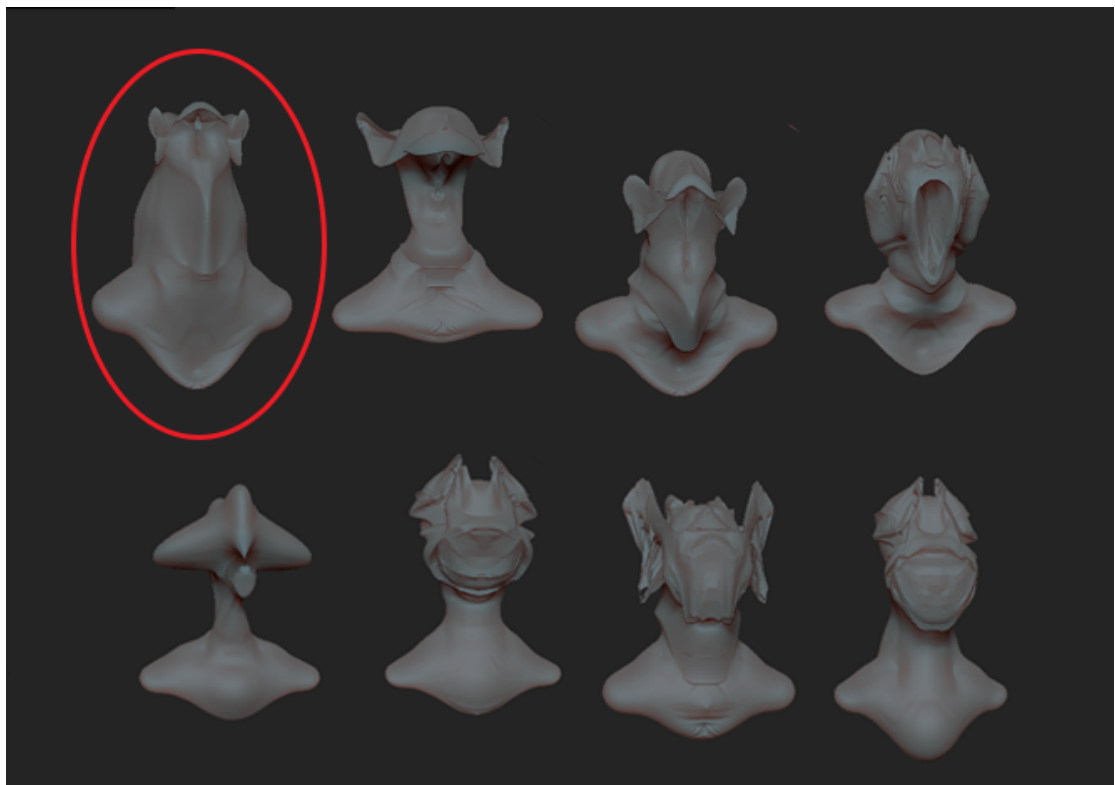
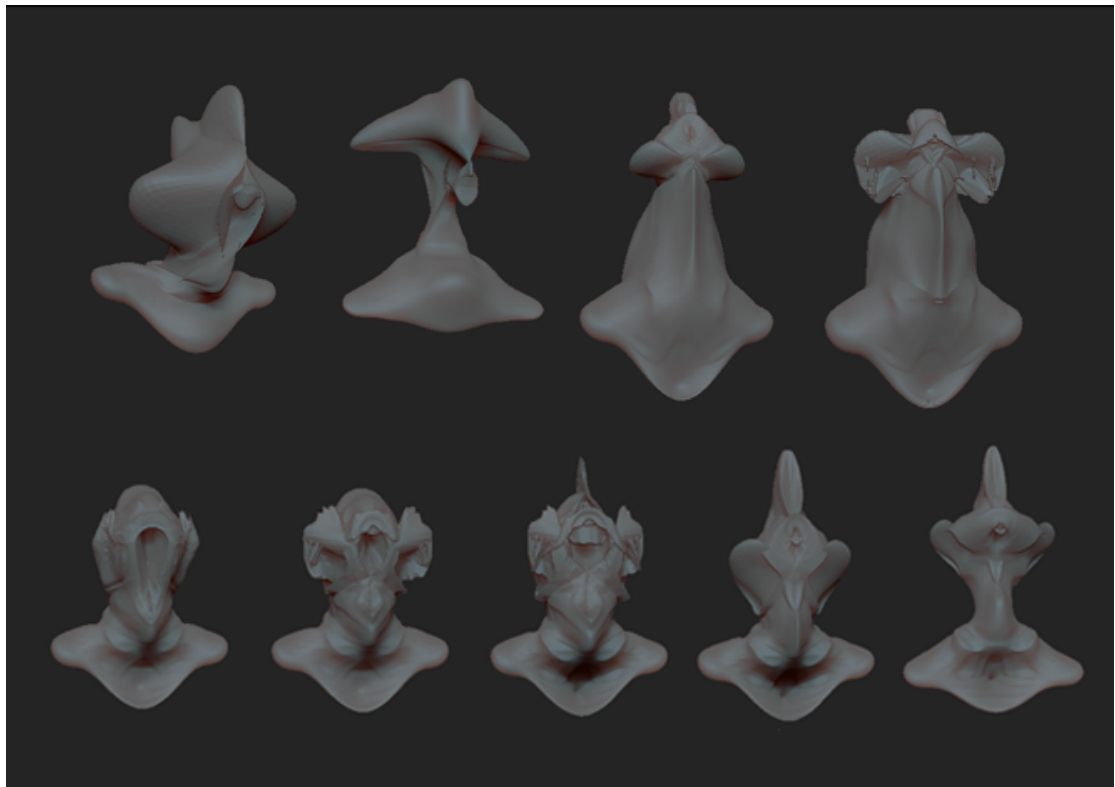


Figure 4.3.7. The thumbnail generation technique that led to the sculpture shown in figure 4.3.8. (The thumbnail circled in red was the basis for this sculpture) by Adalian, 2012.

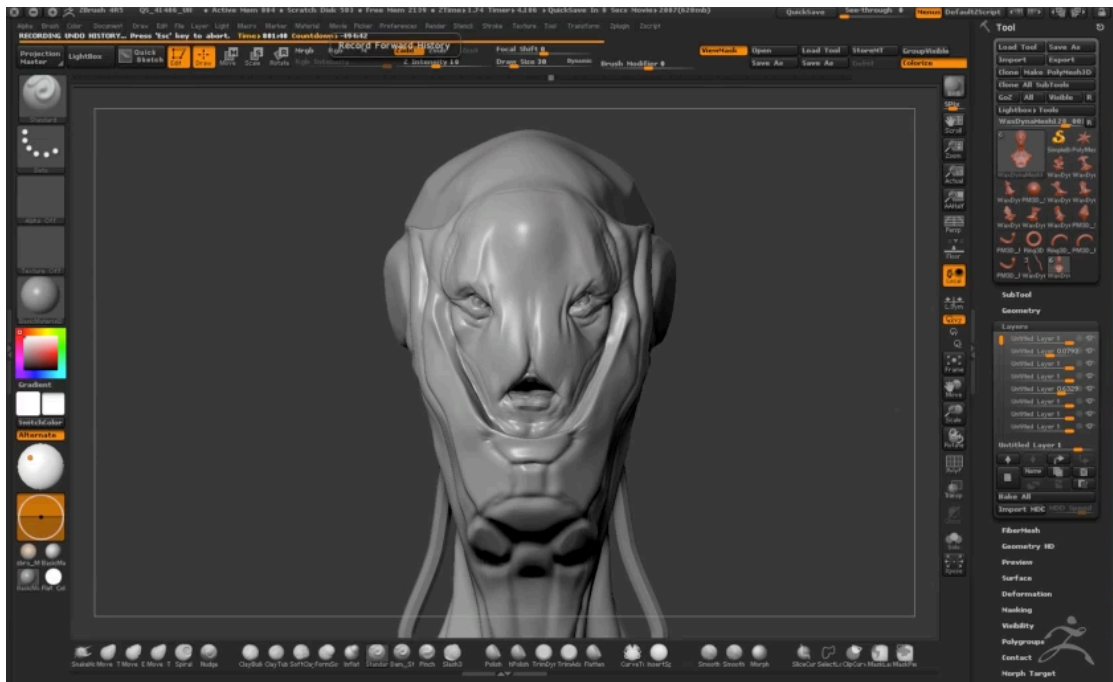


Figure 4.3.9. See the attached USB drive for video showing process of developing chosen thumbnail in final sculpture. (The following chapter goes into further detail on this process), by Adalian, 2012.



Figure 4.3.10. Cycle three example outcome of practice. Adalian (2013).

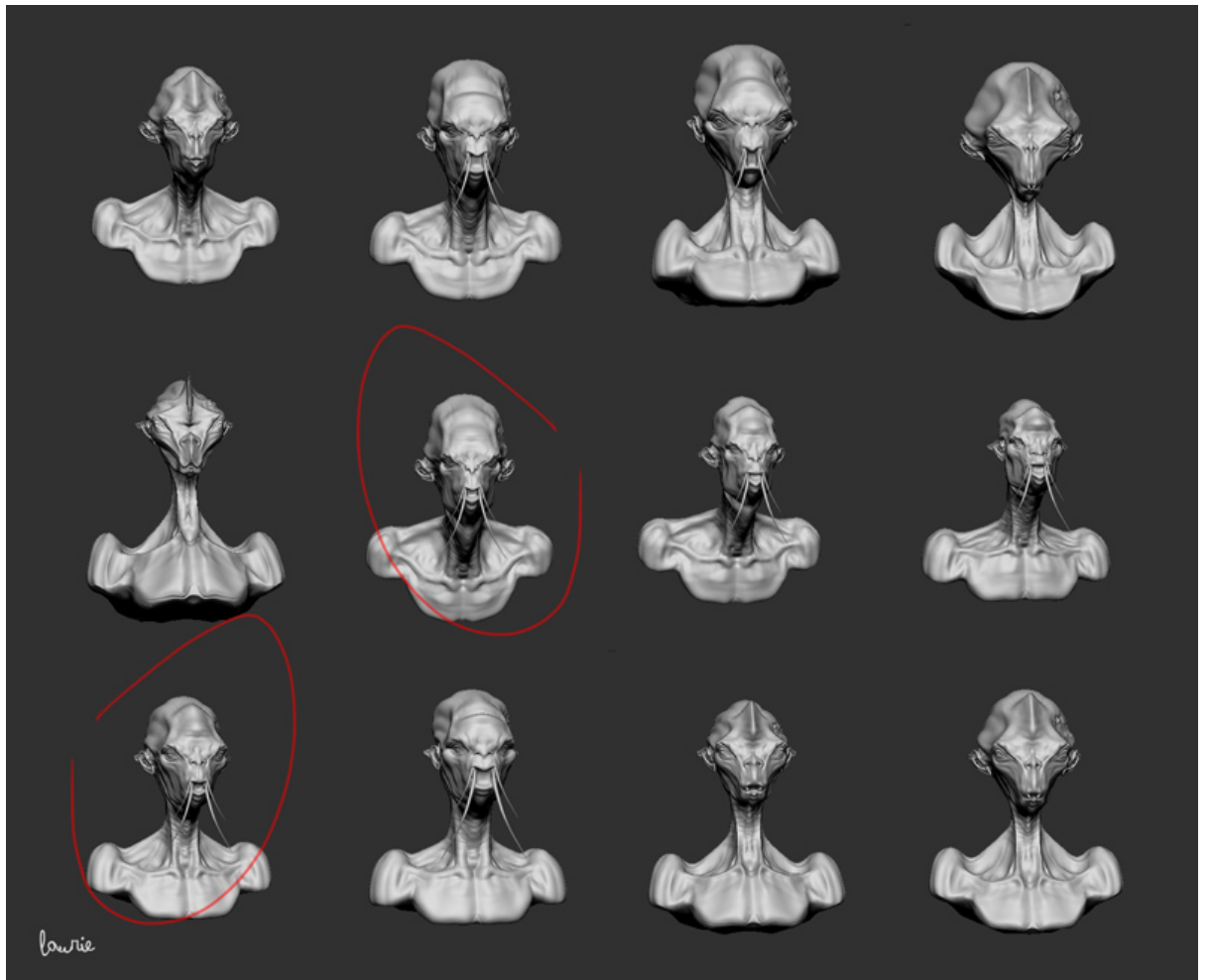


Figure 4.3.11 the thumbnail generation technique applied after most of the sculpting had been done. The sculpture in the top left was the original sculpture. The thumbnails were created once most of the initial sculpting had been done. (See figure 4.3.12 and figure 4.3.13 for final outcomes.) by Adalian (2013).

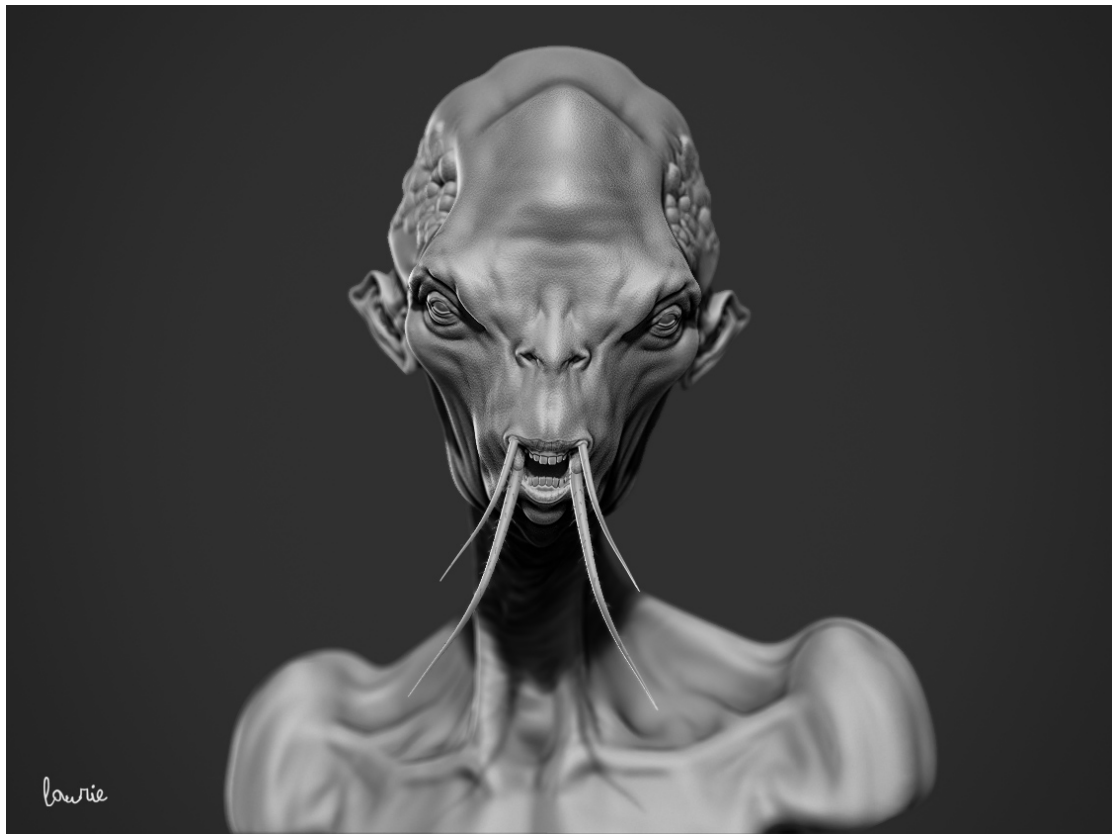


Figure 4.3.12 Cycle three example outcome of practice by Adalian, 2012.

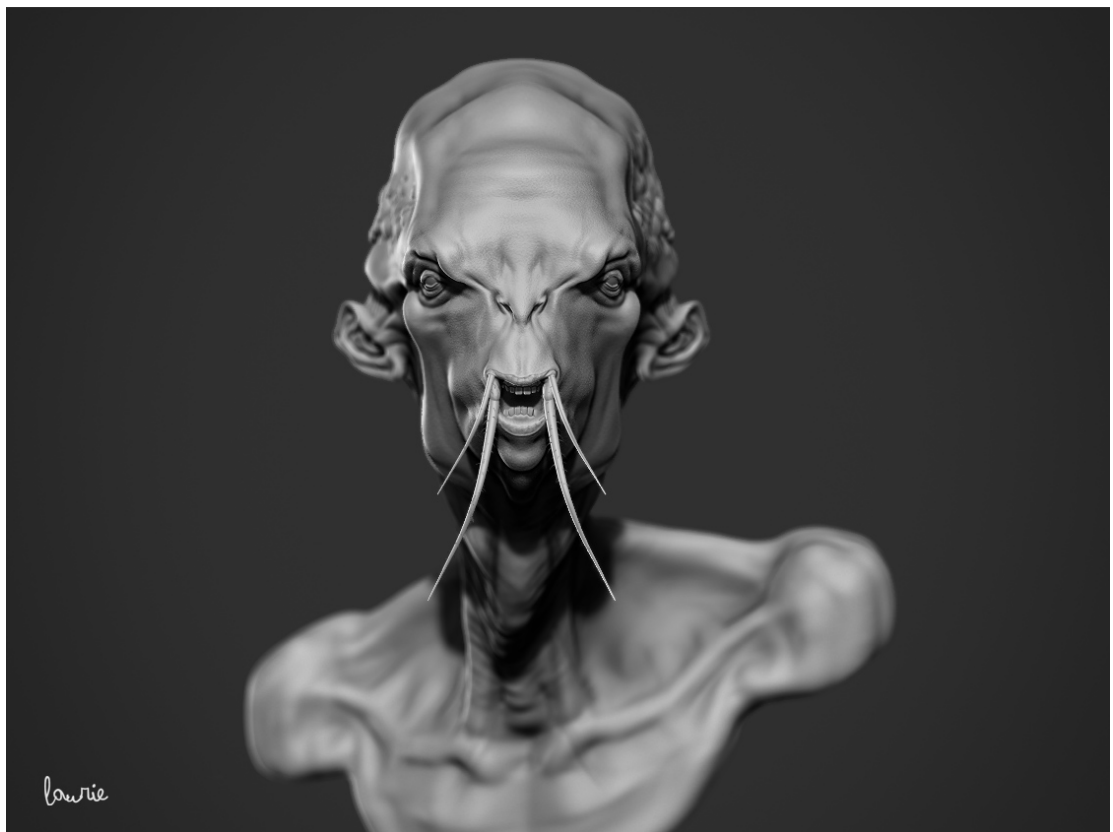


Figure 4.3.13 Cycle three example outcome of practice by Adalian, 2012.

4.4 Cycle 4 – Practical application

Introduction

The aim of this final cycle of creative practice was to test the validity of the method of generative ideation established in the third cycle. The purpose of this cycle was to consolidate my findings and see how this technique could be managed within a loose brief. This cycle enabled me to see how it would work under some structured and confined parameters. The purpose of this final cycle was to consolidate the findings by testing the assumptions and processes that had been developed in the previous cycles. Introducing these assumptions and processes into a more rigid creative brief to challenge how they operated in a more practical scenario.

Plan

For the final cycle of this study I would undertake a series of concept sculptures for a fictitious pre-rendered game cinematic, first person action and adventure game called Space Port. The premise of the game is to build a corporate space empire through the encounters of various species of alien life to trade with. The brief was to produce a series of alien concept busts that could be construed as possibly aggressive and untrustworthy. These aliens were to play the antagonists in the game

Action

I was now familiar with the preparative and generative phases of ideation, from the previous cycles of practice. The creative brief gave me enough direction to risk approaching the generative stage of my practice without having to engage with the ‘preparative ideation chart’ that I had developed in a previous cycle.

From repeatedly using the tools and techniques in previous cycles I had developed the ability to believe in my practice in a way I had not prior to undertaking this research. I found myself accepting mistakes and reframing them as positives, using ‘paredolia’ to find possibilities where I had not seen them previously. Becoming more immersed in my practice, I had developed the ability that Gray and Malins (2004, p.22) describe as “improvisation learned in practice”. Reflecting in action to

help identify that repetition and experience proved to be one of the best ways of improving my practice.

For this first stage I set about exploring the forms, silhouettes and shapes of the head of the concept using the ‘layer ideation’ technique to create several thumbnails.

These thumbnails were individually saved out, during this sculpting session, for both reflection and analysis. This process was done in order to maintain creative momentum and not let negative judgements of the work build up, to minimise ‘resistance’ from arising during my practice.

Figure 4.4.1 below is a video of an example of the ‘layer ideation’ technique being applied to my practice.

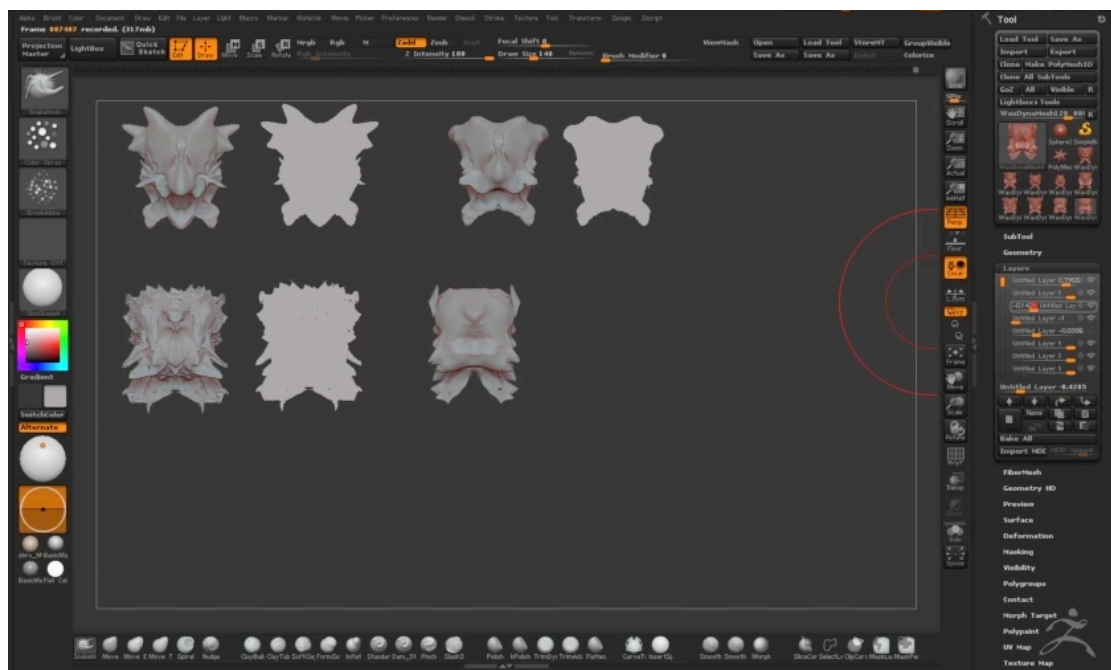


Figure 4.4.1 see the attached USB drive for video of ‘layer ideation’ in action by Adalian, 2013.

From here, I selected three thumbnails that excited me, to push the concept into a more developed form. Then by refining the shape and forms of these sculpted thumbnails, secondary forms were added to develop their anatomy in a more tangible direction to fulfil the brief (see figure 4.4.2). Once the secondary forms were established I added the tertiary fine details.

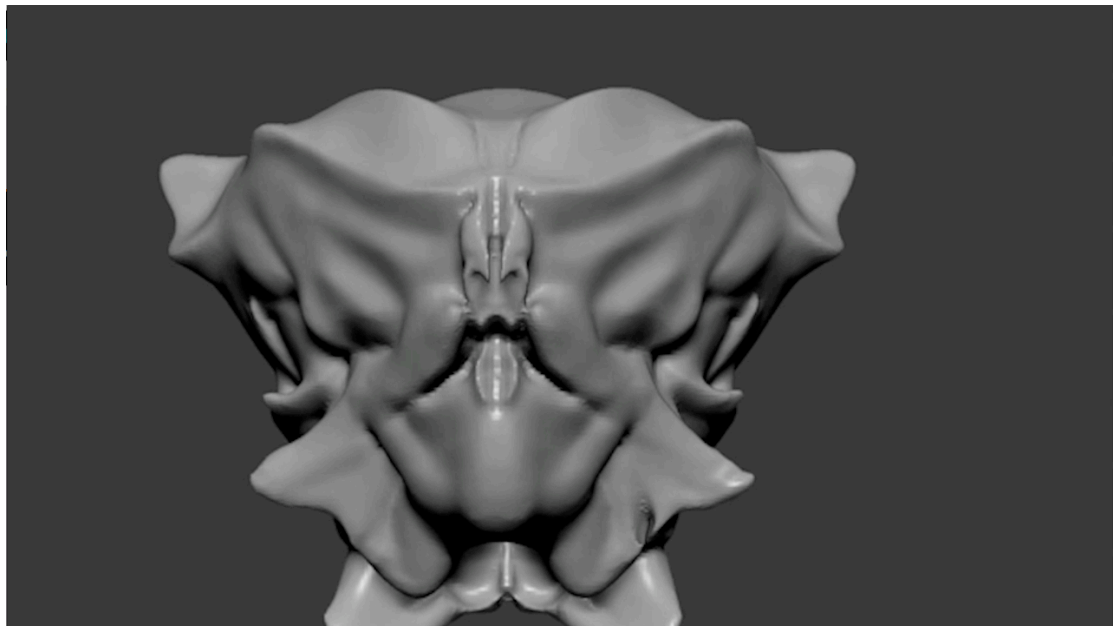


Figure 4.4.2 See the attached USB drive for establishing secondary forms of a selected thumbnail video by Adalian, 2013.

In this cycle, I have also tried to see what result would come from applying ‘layer ideation’, post sculpting at the lowest sub-divisions so as to not to destroy any detail at the higher sub-divisions. On completing a digital sculpture at the lowest subdivision, the layer intensities are adjusted to help establish the proportions of the sculpture. The layers are used to push and pull the sculpture to varying degrees, in order to create alternatives to the original (see figure 4.4.8).

In order to generate the thumbnail sheet seen in figure 4.4.8, I chose a single primitive thumbnail to develop, having used the 'layer ideation' technique to find the primary forms early in the sculpture, as was the process I had developed in my practice. I then sculpted this single version to an adequate level of detail. Then, I applied the ‘layer concepting’ technique at the end of my sculpting process and at the lowest subdivision level to prevent the sculpting detail at the higher levels being distorted. This technique can be applied at almost any point in the sculpting process, but is particularly useful in the early stages of a sculpture and at the end to quickly generate several iterations/ thumbnails from a highly detailed single sculpt.

Reflection

The method of generating ideas under more rigorous conditions proved this technique could be controlled and be applicable to more focused ideating that had been given a context rather than just ‘blue sky’ ideation.

Pareidolia proved valuable in helping to determine the figurative forms in abstract shapes that this process of thumbnail generation presented. I applied the technique at various stages of the ideation and sculpting process. This proved invaluable in helping to develop the direction the sculptures were taking to create appealing outcomes that fulfilled the brief. I did find that having too many layers when ideating in this way made it hard to maintain a clear focus on ideation. When dealing with a lot of layers, naming them helped to maintain the focus of my ideation process and not get caught up in the technical aspects of the software.

The anatomy of these creatures was far from human. These sculptures often presented me with a lot of queries on how the anatomy of these creatures would actually work. I used reference from different animal groups to help rationalise these anatomical questions. More research into functional morphology in conjunction with this technique of dynamically sculpting three-dimensional ideation thumbnails would help to resolve some of the anatomical problems that arise to help address them more efficiently within my practice. Displaying different angles and poses of the final rendered sculptures along with incorporating more asymmetry could help to create more engaging and dynamic concept art.

One of the outcomes from this final cycle shown below was posted on Pixologic’s official Twitter feed (see figure 4.4.3).



Figure 4.4.3 A screenshot from Pixologic’s official Twitter feed by Twitter/Pixologic, 2013.

Out of all the sculptures I have produced and posted online, this one was identified as an exemplar of my research process. The recognition by an eminent industry body provides some affirmation that the ‘layer ideation’ technique is a valid means of ideating directly within a digital sculpting package, as the idea is the foundation the rest of the sculpture is built on.

Several digital sculptors liked the ‘layer ideation’ approach to thumbnail generation directly in a digital sculpting software platform. Shellac (2014), an emerging digital sculptor, reviewed the technique and stated that it was “a great technique” and “a really inspiring” use of layers. Sadicus (2014), a more experienced digital sculptor affirmed that this method was “an interesting thumbnail technique” and a “good use of layers”.

More feedback of this nature would have been valuable to help validate and develop this method of ideation further from qualitative external practitioners. The Internet proved to be a beneficial tool to help reflect on my practice. However, geography prevented me from accessing the communities of practice related to this field as directly as I would have preferred to help reflect on the research.

Summary

The final cycle of practice for this study used a set of parameters to remove the broader nature of ideation in previous cycles. By narrowing the creative direction of the ideation process, developed through this research the assumptions and processes could be evaluated under more tangible conditions; this may be helpful for emerging sculptors who have been provided with a more restrictive brief.

The feedback from emerging digital sculptors helped to confirm my findings, but was by no means conclusive. Additional responses from the digital sculpting community would help to substantiate and expand upon the findings of the research.

Digital sculpting alone is not necessarily superior to drawing or verbalisation for creating designs of characters or creatures. Digital sculpting is an expedient method for creating design variations, which can then be either developed directly in the

digital sculpture software or using a method of drawing over the various design silhouettes that have been sculpted as Wynia (2013) employs this draw over technique, which can be seen in this video link: <https://vimeo.com/63546116>

Figure 4.4.4. ‘Crabby Patty’ by Wynia ,2013 character design outcomes from draw over technique from a digital sculpting session.

Figure 4.4.5 – 4.4.9. for example outcomes from the third cycle of practice: -



Figure 4.4.5. Thumbnail generation technique that led to the sculpture shown in figure 4.4.5. (The thumbnail circled in red was the basis for this sculpture) by Adalian, 2013.

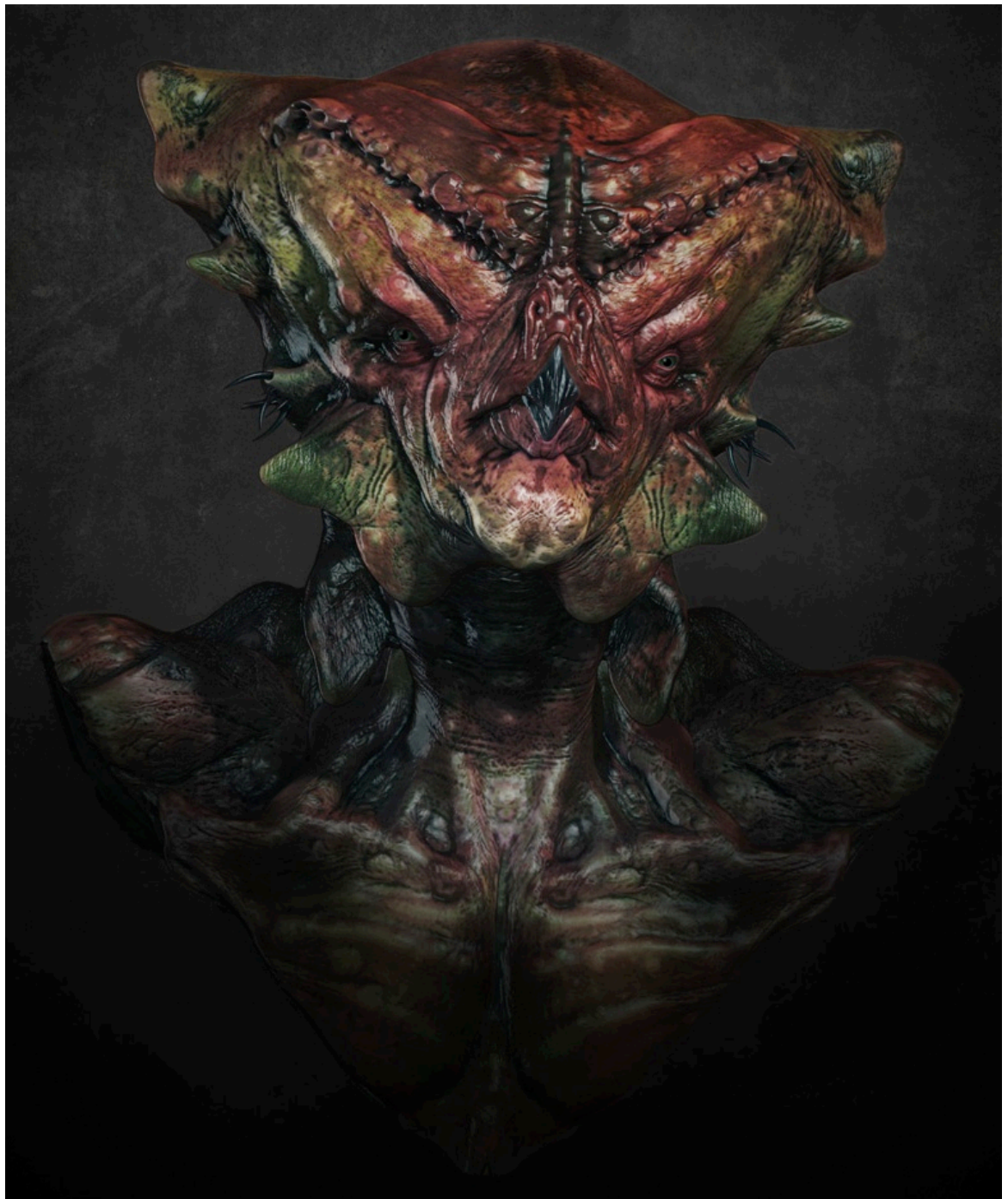


Figure 4.4.6 Cycle four example outcome of practice by Adalian, 2013.



Figure 4.4.7. Thumbnailing technique that led to the sculpture shown in figure 4.4.8. (The thumbnail circled in red was the basis for this sculpture) by Adalian, 2013.

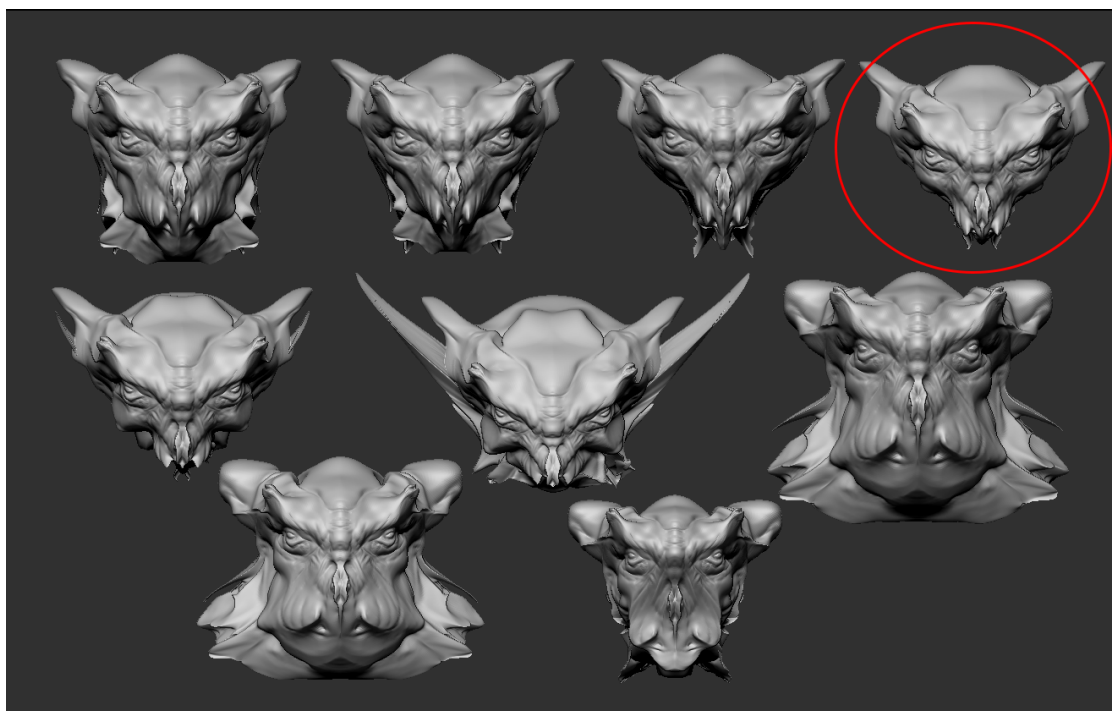


Figure 4.4.8. Mid-way through the sculpting process I implemented the thumbnailing process to develop the head shape further get to figure 4.4.8 by Adalian, 2013.



Figure 4.4.9. Outcome of sculpture developed from figure 4.4.6 & 4.4.7 by Adalian, 2013.

Chapter 5: Discussion and Conclusions

The aim of this practice-led research project was to explore and frame how digital sculpture can be implemented as the primary conceptual development and design tool for the ideation of fictitious creatures or characters. My research makes a significant contribution to the field of digital sculpture, in particular for other emerging digital sculptors who require a framework for the discovery of ideas within their practice without relying on drawing as their primary conceptual tool. This research did not set out rebut the significance of drawing to the preproduction process, rather it specifically targets those artist who may not find drawing to be the most intuitive or perhaps expressive method for the ideation of digital sculptures.

The tacit nature of the research findings has meaning, as I was not conscious of the delineation between the preparatory and generative stages of ideation in my practice. Understanding the relationship between the preparatory and generative stages of ideation in my practice helped to identify the different thinking needed and how actioning different ideation techniques could be applied to these stages of ideation in order to better support my overall ideation process. The methods of practice espoused in this research present a framework that supports the delineation between preparative and generative creature ideation to separate and focus the thinking and action components of ideation.

The research methodology proved beneficial as the iterative cycles of plan, action and critical reflection allowed me to identify areas of my practice that could be improved on and then experiment with alternative creative processes. It became evident through my research that my practice needed to have some sense of direction and focus to create a goal to achieve. The framework and methodology of the study revealed unforeseen outcomes not just directly within my practice, but also led to a clearer perspective of my process and efficiency as a practitioner. Through practice-led cycles, along with a framework for reflection, the study helped to develop strategies to deal with the internal self-critical voice along with developing practical

methods of ideating creature designs directly in a digital sculpting environment in order to expand my practice.

The first cycle focused on the issues within my practice that led me to undertake this research. From this process, I recognised that my ideation process needed structuring in the preparative stages. It was proving hard to focus on developing clear ideas as I was struggling technically with the software and resolving the breadth of ideas at the same time. Through reflecting on the issues and needs of my practice from the first cycle, the direction of the research was formulated to help depart from the conceptual rut I had found myself in.

The second cycle helped me to appreciate that there are preparative and generative stages to ideating. In order to manage and structure my ideas, the second cycle addressed the preparative stage of my ideation process. The research led me to realise that ‘verbalisation’ of ideas is a beneficial preparatory ideation tool when trying to disrupt drawing as the primary ideation apparatus.

‘Verbalisation’ within my practice came to take the form of a table developed over multiple iterations. These ‘ideation charts’ served as a preparatory tool to record and narrow the conceptual focus, guiding the course of my ideation process within the digital sculpting environment. It was a means of establishing and defining the direction (much like sketching can), before embarking on the generative ideation process. This ‘ideation chart’ as it came to be called, could serve as a preparative ideation tool for aspiring character or creature designers regardless of the medium.

In this cycle I created a dichotomy having used verbalisation as an ideation tool I had abandoned visualisation. Through reflection I observed that verbalisation is generally a poor or secondary substitute for visualisation. Visualisation is a more accurate method of communicating design choices and variations, as it tangibly establishes the visual framework of the idea. Verbalisation is a lot loser form of ideation as it is based on words rather than images.

The third cycle of my research concentrated on developing a visualisation method of ideation for the generative elements of my digital sculpting ideation process. This

research led me to identify the characteristics of sketching, which led to a technique where various sculpting strokes were recorded on different layers. The intensities of those various layers could then be adjusted to create thumbnails directly in a digital sculpting software platform. The more aggressively this technique was pushed the wilder and more abstract the results were. I was intrigued to see how I could rationalise these conceptual and often-abstract shapes the thumbnails presented, into figurative sculptures to develop creature designs. An effective method of resolving this issue in my practice was ‘pareidolia’.

‘Pareidolia’ serves as a means of perceiving a form where one does not necessarily occur. Consolidating these two components together became of great significance to the generative outcomes of my digital sculpting ideation process. The final cycle consolidated these findings. The combination of ‘layer ideation’ technique and ‘pareidolia’ proved to be of importance to my practice as a potent means of ideating directly in ‘digital clay’ without relying on drawing to first establish the idea. This framework presents a method of designing forms directly in a digital sculpting software discovering designs during the process.

The use of the ‘layer ideation’ technique adapted into my workflow helped me to let go of my creative insecurities and embrace them as part of my workflow, which for me, was a monumental shift forward in my creative momentum. The ‘layer ideation’ process facilitates both character design and development throughout my sculpting sessions, facilitating the conceptual fluidity I require in my practice. However, it can provide some wild and unpredictable outcomes. If not applied in an organised fashion, for example, the labelling of layers. This technique is of particular use when a sculptor is looking to explore the primary forms and shapes of the sculpture and does not have a clear design outcome in mind early in the sculpting session.

Initially, I started using this technique of ideating only at the beginning of the generative phase to develop a variety of thumbnails that could serve as the basis for potential digital sculptures. I quickly discovered that this approach to ideating directly in a digital sculpting environment could be effectively used at any point in the sculpting process. Using this method, one could present different conceptual directions the sculpture could take. This finding would be important in a scenario

where variations of a digital sculpture, which has already been sculpted to a high degree of detail, could easily be presented, should the situation arise.

For the fourth and final cycle of practice, I put this generative ideation technique into a more realistic creative scenario by narrowing the focus. This time applying a simulated brief instead of just being required to work under ‘blue sky’ ideation conditions. At the start of this journey I thought that I would be looking at my work more outwardly, but a lot of the findings discussed in this exegesis, came from reflecting on my internal creative process. This realisation freed me to be more accepting of my mistakes and seeing them as part of a dynamic creative process. The tension and rigidity of my ideas and workflow have become more fluid than they were before I started this research.

There was a substantial focus on developing a sound anatomical knowledge over the course of this research, which did prove beneficial to my practice. Nonetheless there was the scope to break away from the anatomical constraints and place more emphasis on shape exploration. Observing forms and shapes found in nature as well as cultural artefacts such as masks and paintings, could have been valuable in my practice, in order to help break the proportions and relationships of the characters to make them more unique. Functional morphology could have then been employed to rationalise the shape exploration to help make the anatomy of the creatures more plausible.

Through my critical reflection, I identified that there was a tendency in the final imagery of repeatedly maintaining a strict connection between the eyes and the nose. The final illustrations did not always demonstrate the full potential of this ideation method as I was conforming to humanistic anatomical proportions too tightly at times. The work of Papstein (2012) in figure 5.1 illustrates how he uses a similar layering technique to depart from the constraints of humanistic anatomical proportions.

I focused on sculpting organic busts to focus learning the anatomy of the head and upper body. Given more time to research anatomy further, the ‘layer ideation’ technique could be expanded into my practice to sculpt full bodies; this is something

that the digital sculptor Kurt Papstein does (see figure 5.1). There is also the scope for further study in adapting this technique to hard surface sculpture i.e. vehicles, weapon and robots.

Figure 5.1. See attached USB drive for a video of using layers to push the concept by Papstein 2012.

For me to embrace the ideation process, it was important that I was not completely focused on a final outcome, just mindful of it, to give my sculpting sessions direction. By embracing the exploration of ideas and letting mistakes happen, I often found that I ended up adapting them into the sculpture in some form, when three-dimensionally sketching thumbnails. While helping to examine the aesthetic attributes that emerged from my practice, the reflection I undertook contributed significantly to identifying the underlying flaws in my process, making tacit aspects of my practice more obvious to me.

When my sculpting practice was spasmodic and intermittent, there was a notable decline in the quality of the outcomes from my creative practice. Rehearsing became a significant part of my practice in order to make these processes habitual, helping to reiterate these skills within my digital sculpting. Anders Ericson (2008, p.998) supports the notion that deliberate and sustained efforts to keep sculpting daily will move ones practice forward. I now feel confident enough with the generative ideation component of my sculpting practice that I can now deviate from the

preparatory technique described in my second cycle of research as shown in my fourth cycle.

Figure 5.2 depicts the procedural processes my practice now entails as a result of this body of research. This conceptual framework is of use to emerging digital sculptors who are trying to use a digital sculpting software environment as their primary ideation tool for creating three-dimensional computer generated creatures and characters. This study focused on the first three steps of figure 5.2, as these were the foundational stages of the sculpture where ideation was key to setting up the creative direction and foundation of the sculpture. The following components are specific to my personal digital sculpting practice, but would be insightful for an emerging digital sculptor to bring a sculpture to completion from the ideation stages.

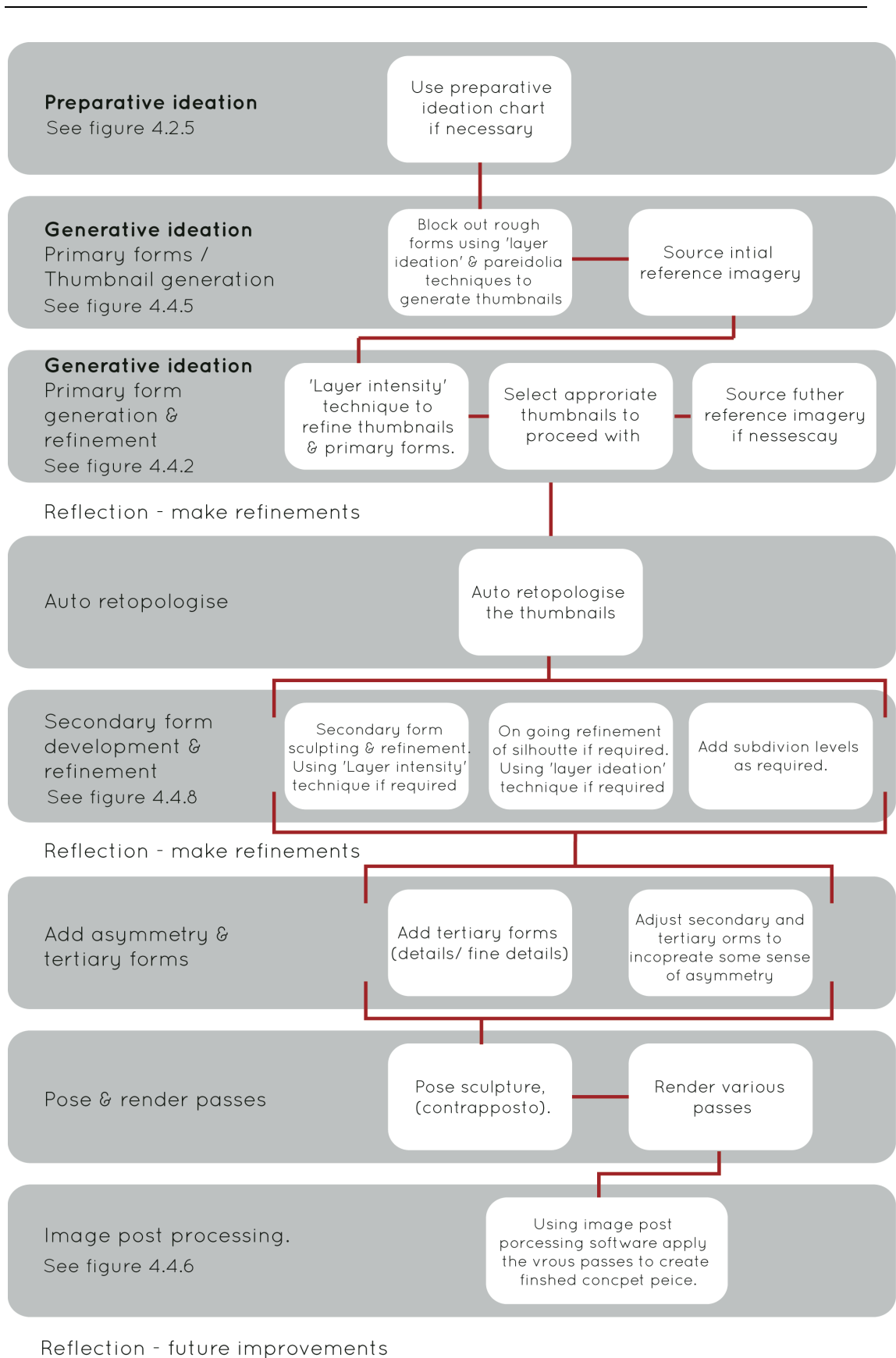


Figure 5.2. Resulting conceptual framework for ideating directly within a digital sculpting software package derived from this research by Adalian 2013.

Considering the compression in production times that feature films and television series are currently undergoing this method of ideation for the conceptual development of creatures or characters could alleviate the requirement of traditional concept artists. Possibly expediting the conceptual art development of a project and creating a more efficient and direct conceptualisation process in a digital sculpting platform.

The method of ideation discussed in this research offers a practical approach to developing design iterations. However, this method would benefit from being one ideation approach in an artist's arsenal of ideation techniques, this being one of them. Sketching can never be totally replaced for a lot of artists, as their primary ideation tool is an immediate and ingrained method of ideating. To dismiss drawing entirely from the arsenal of ideation tools was more indicative of the deficiency in my own practice. However, this does offer some significance to others (particularly early career artists) who may come into a similar situation where they don't feel drawing best represents their ideas. Undertaking drawing classes would help expand one's practice further.

Digital sculpting technology along with the abundance of online information on the subject matter presents a dichotomy on the quality of digital sculpture that is emerging from practitioners. Just because you can hold a paintbrush it does not make you a good painter. Being able to use a digital sculpting software does not make one an effective digital sculptor.

For the emerging digital sculptor who does not have a clear idea in mind when undertaking a sculpting session, the methods examined in this research could be of significance as a valid method of exploring and ideating directly within a digital sculpting package, without having to rely entirely on traditional drawing to help formulate ideas. However, these methods of ideation that this research presents attempt to negate a rounded and solid foundation in the principals and practice of both drawing and sculpture. This conclusion suggests that one may be able to use these ideation techniques to stumble upon an effective solution, based purely on producing a high volume of design variations. With little or no fundamental understanding of proportion or composition, this technique could become a very time

consuming approach to the ideation of designs. Therefore, it is important to note that in order for the methods of ideation presented within this research to be effective, there is a necessity for the practitioner to have a firm grasp in the fundamentals of art.

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Appendices

Appendix One: Aborted Cycles

- Base mesh – Predictable and repetitive outcomes. Discussed in chapter 4.1
- ‘Shadow box’ – An effective method of generating simple basemeshes specific to Zbrush, requires some basic drawing to generate the initial base mesh, but as the aim was to resist drawing I felt that this contravenes one of the key aims of this body of research. Southern (2011) was a proponent of the method.
- Abstract symmetry drawing – using a symmetry drawing application to generate visual ideas that were then translated into a digital sculpture gave some interesting outcomes. This method impinged on my resistance to drawing for this study.

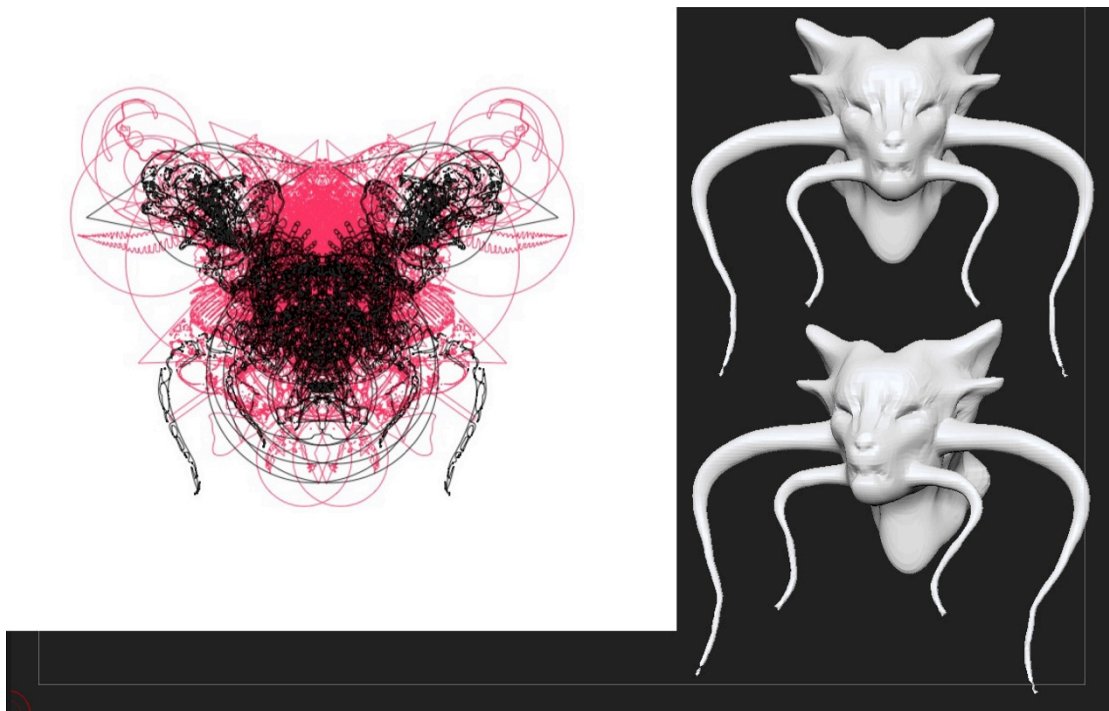


Figure 6.1 Example outcome of ‘abstract symmetry drawing’ technique by Adalian 2012.



Figure 6.2 Example final outcome of ‘abstract symmetry drawing’ technique. by Adalian 2012.

This technique developed into ‘abstract symmetry sculpting. Using random shapes to generate the forms. Similar to a Rorschach test, finding the sculptures primarily from using this technique led to some interesting sculpts. However, the outcomes were hard to foresee and control in order to create predictable consequences every time.

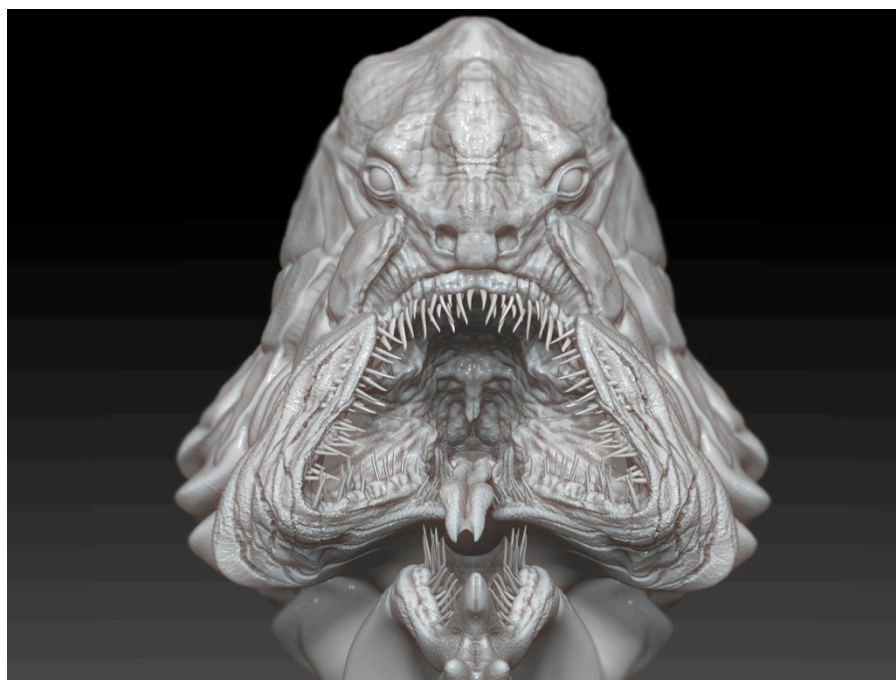


Figure 6.3 Example outcome of ‘abstract symmetry sculpting’ by Adalian 2012.

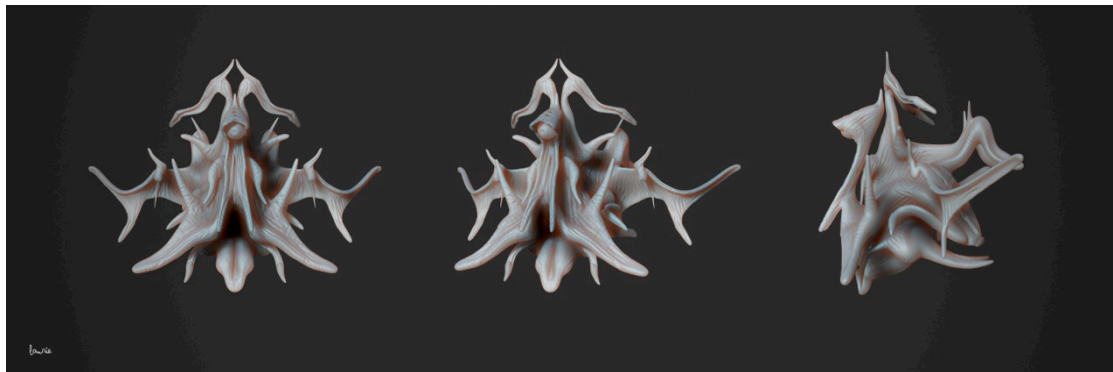


Figure 6.4 Example outcome of ‘abstract symmetry sculpting’ by Adalian 2012.

‘Mesh insertion armature anatomy method’ – Got some interesting results but very time consuming to set up before I could really analyse the overall direction and forms of the sculpt. This method could be useful for sculpting from drawing Kingslien (2011) was a proponent of the method.

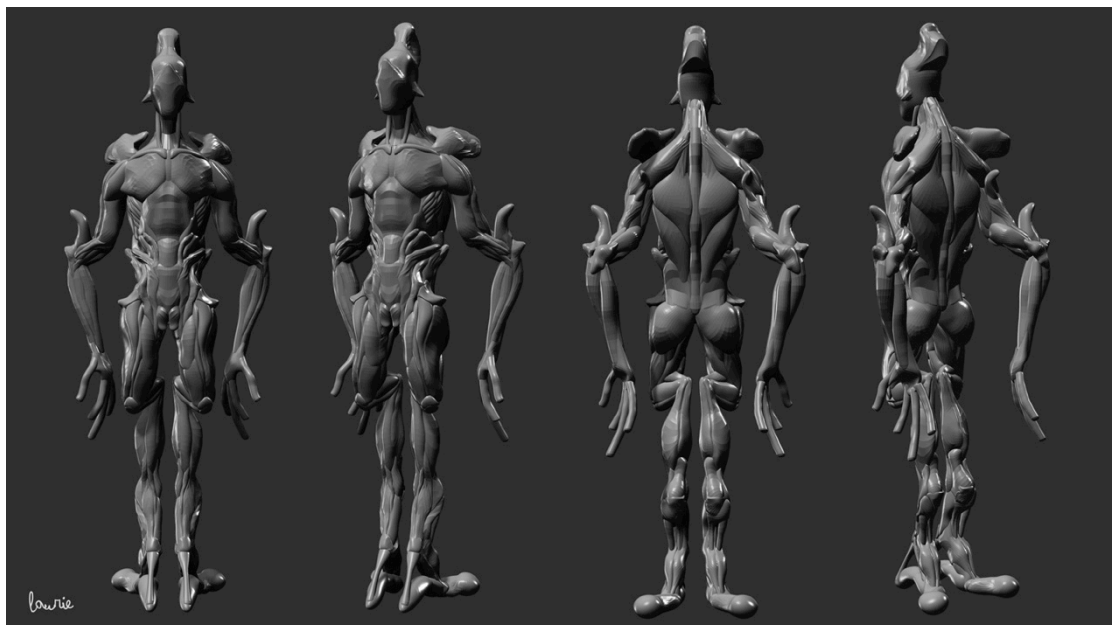


Figure 6.5 Example outcome of the ‘Mesh insertion armature anatomy method’ by Adalian 2012.

‘Mannequin ideation’ - Zbrush comes with several present mannequins as base meshes. As stated I had issues with using the same base meshes for my sculpting

practice. This technique was good for creating dynamic poses, but the geometry they create can be awkward and time consuming to sculpt with their topology.

‘Skeleton ideation’ – I would use a base mesh of a skeleton and manipulate it to form the basis of different creatures bodies. I would then use digital clay to block in the muscle groups .It was an interesting method in aligning the anatomy of the sculpture, but was restrictive when creating non-humanoid characters and was a time consuming process to layer in the muscles, similar to the ‘mesh insertion armature anatomy’ approach. (See figure 6.7).

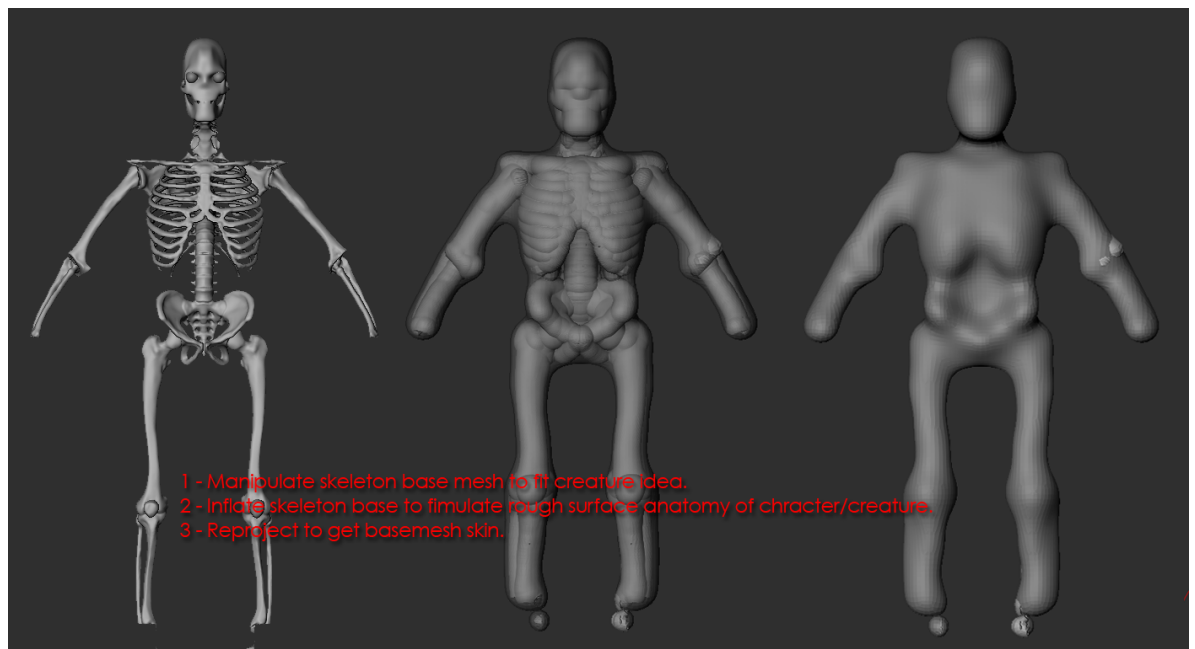


Figure 6.5 Example outcome of the ‘Skeleton Concepting’ method’ by Adalian 2011.

Appendix two: Further outcomes of practice from cycle one.

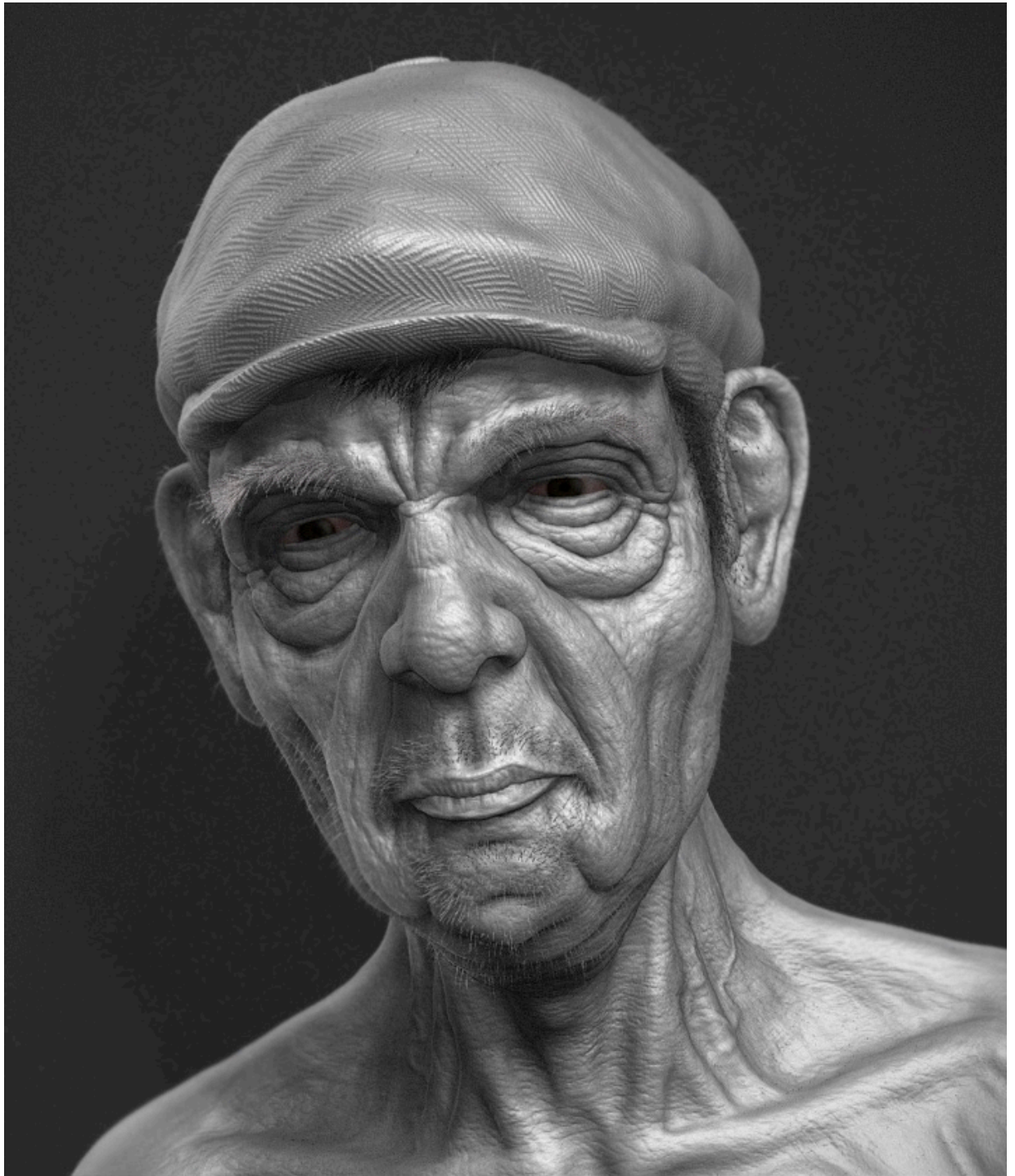


Figure 7.1 by Adalian 2011.

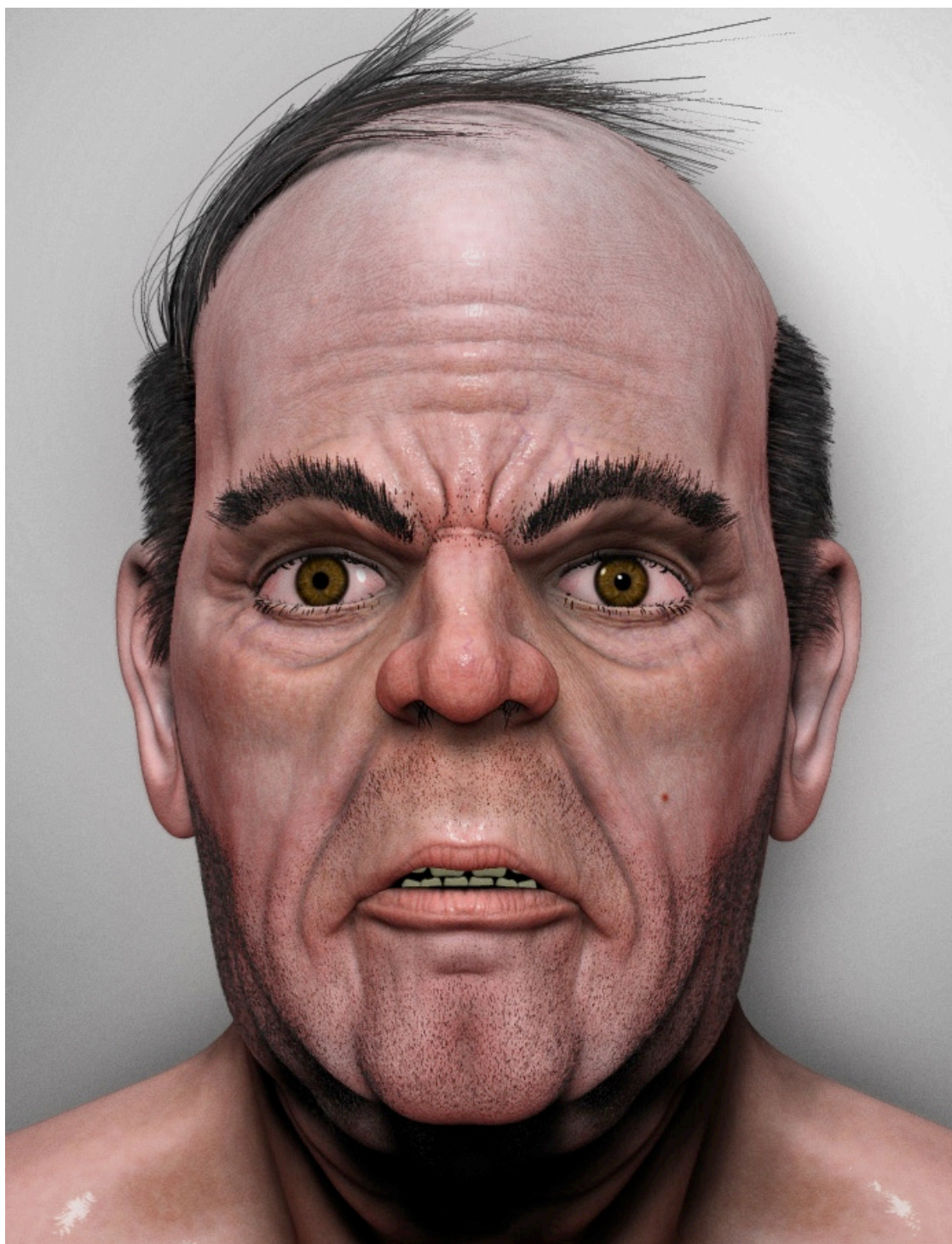


Figure 7.2 by Adalian 2011.



Figure 7.3 by Adalian 2011.



Figure 7. 4. by Adalian 2012.

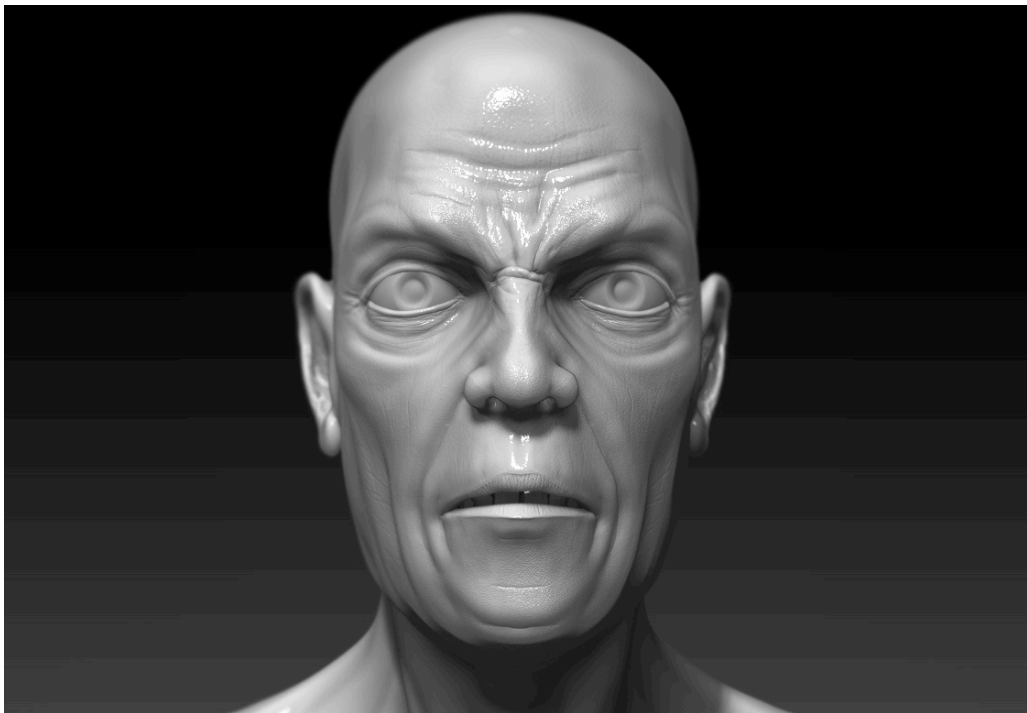


Figure 7.5 by Adalian 2012.



Figure 7.6 by Adalian 2012.



Figure 7.8 by Adalian 2012.

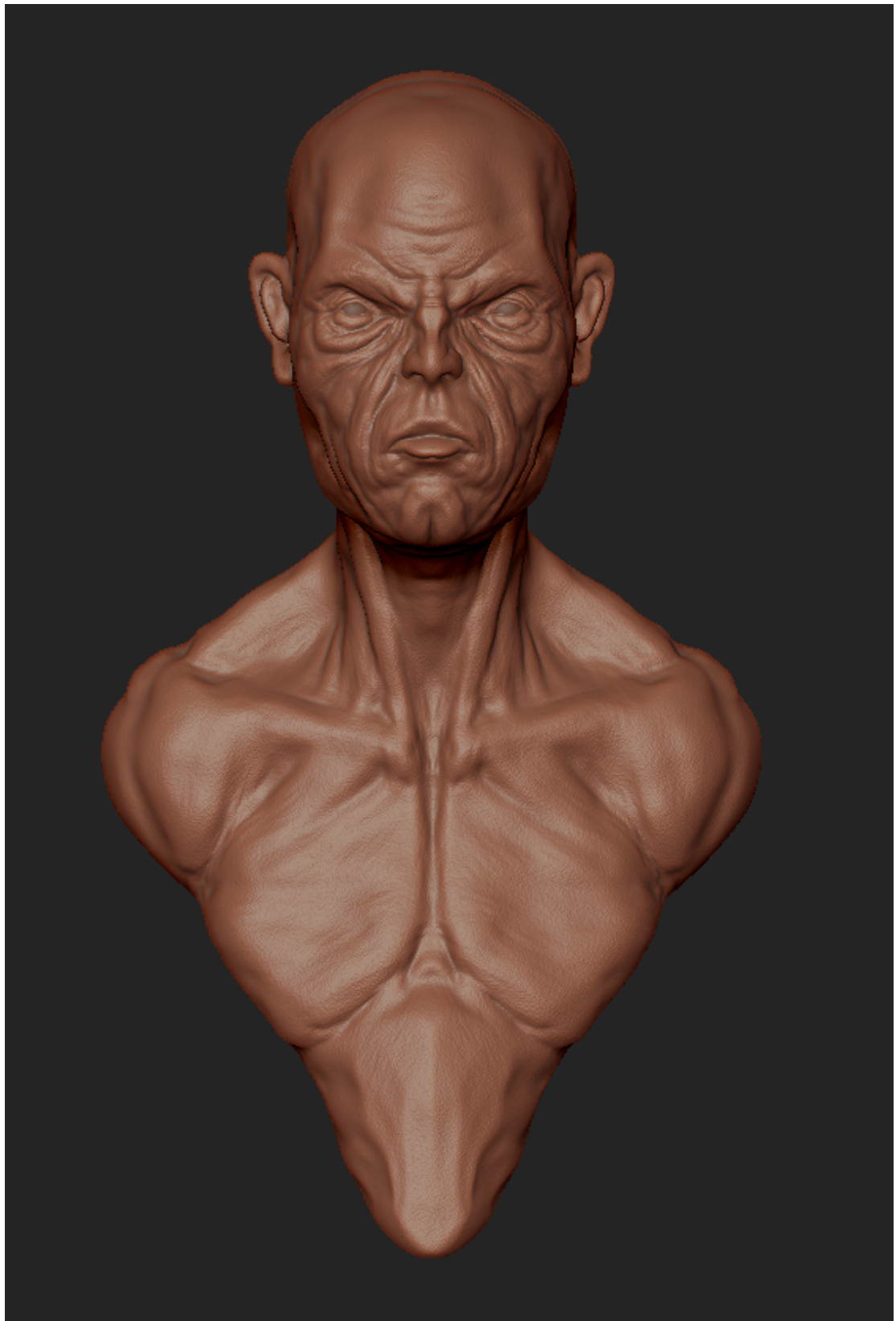


Figure 7.9 by Adalian 2012.



Figure 7.10.1 by Adalian 2012.



Figure 7.10.2..Adalian (2012).

Appendix three – Further outcomes of practice from cycle two.

CONCEPT IDEATION CHART V1									
	WALK	SWIM	SLIDE	CLIMB	GLIDE	DIG	WHEELS	FLOATS	TELEPORT
MOBILITY									
TYPE OF CHARACTER									PERSONALITY TYPE / ATTITUDES
REPTILE									AGGRESSIVE/PEACEFUL
HUMANOID									DISTANT/WARM
INSECTOID									ASSERTIVE/PASSIVE
MECHANICAL									DECIVER/GREEDY
AVAIAN (BRID)									FUNNY/HAPPY
AQUATIC									SAD/DEPRESSED/LONELY
EARTH BOUND									MAD/SAIN
ALIEN									EXTROVET/INTROVERT
AMPHIBIAN									
BODY TYPE/FEATURES									
	ECTOMORPH	MESOMORPH	ENDOMORPH	OLD	YOUNG	TEETH	SCARS	PROPS	SKIN
Grotesque Butcher	Thin	Broad shoulders	Soft body (fat)			Sharp		Apron	Fur
Influences:-	Small bones	Narrow waist	Round shape			Goofy		Knives	Feathers
Delicatessen	Flat chest	Mature look	Round face					Cleaver	Armour
	Youthful look	Strong	Short neck						
	Light muscles	Large chest	Low muscles						
	little body fat	Long torso							
	Tall	Thick skin							
SYMBOLIC ARCHETYPE									
LIGHT VS. DARK									SITUATIONAL ARCHETYPE
WATER VS. DESERT									THE QUEST / THE TASK / THE JOURNEY
HEAVEN VS. HELL									THE INITIATION
MAGIC WEAPON									THE FALL
WISDOM VS. STUPIDITY									DEATH/REBIRTH
SUPERNATURAL									NATURE VS. MECHANICAL WORLD
FIRE VS. ICE									GOOD VS. EVIL
CHARACTER ARCHETYPE									THE UNHEALABLE WOUND
	PROTAGONIST	ANATAGONIST	REASON	EMOTION	SKEPTIC	SIDEKICK	GUARDIAN	CONTAGONIST	THE RITUAL

Figure 8.1. The first iteration of the ‘preparative ideation chart’ and the outcome of my sculpting practice, (figure 4.2.6, overleaf) by Adalain 2011.

Figure 8.2 The outcome of my sculpting practice from using the first iteration of the ‘preparative ideation chart’ (Figure 8.1) by Adalian 2011.



CONCEPT IDEATION CHART V3									
BODY TYPE/FEATURES	ECTOMORPH	MESOMORPH	ENDOMORPH	AGE	ENVIRONMENT	TEETH	POSTURE	PROPS	SKIN
Feline features	Thin	Broad shoulders	Soft body (fat)	Old	Nocturnal	Bad	Slouched	Shoes	Scars
Elegant	Small bones	Narrow waist	Round shape	Middle aged	No air	Sharp	Upright	Clothing	Fur
Long neck	Flat chest	Mature look	Round face	Young	Jungle	Goofy		Jewellery	Feathers
	Youthful look	Strong	Short neck		Mountain			Gun/s	Armour
	Light muscles	Large chest	Low muscles		Cave			Knife/s	
	little body fat	Long torso			Sky				
	Tall	Thick skin			Volcanic				
					Urban				
<u>MOBILITY</u>	WALK	SWIM	SLIDE	CLIMB	GLIDE	DIG	WHEELS	FLOATS	TELEPORT
<u>TYPE OF CHARACTER</u>	REPTILE	HUMANOID	INSECTOID	MECHANICAL	EXTRA TERRESTRIAL	AQUATIC	EARTH BOUND	AMPHIBIAN	AVAIAN (BRID)
<u>PERSONALITY / ATTITUDES</u>	AGGRESSIVE PEACEFUL	DISTANT WARM	ASSERTIVE PASSIVE	DECIVER HONEST	DEPRESSED ISOLATED	FUNNY SERIOUS	INSANE SANE	EXTROVET INTROVERT	
<u>CHARACTER ARCHETYPE</u>	PROTAGONIST	ANATAGONIST	REASON	EMOTION	SKEPTIC	SIDEKICK	GUARDIAN	CONTAGONIST	SOLDIER
<u>SYMBOLIC ARCHETYPE</u>	LIGHT VS. DARK	WATER VS. DESERT	HEAVEN VS. HELL	MAGIC WEAPON	WISDOM VS. STUPIDITY	SUPER NATURAL	FIRE VS. ICE	INNER BATTLE	
<u>SITUATIONAL ARCHETYPE</u>	THE QUEST / THE TASK / THE JOURNEY	THE INTIATION	THE FALL	DEATH/REBIRTH	NATURE VS. MECHANICAL WORLD	GOOD VS. EVIL	THE UNHEALABLE WOUND	THE RITUAL	

Figure 8.3 The third iteration of the 'preparative ideation chart' and the accompanying sculpture outcome (figure 4.2.8, overleaf by Adalian 2011).

Figure 8.4 The outcome of my sculpting practice from using the third iteration of the 'preparative ideation chart'. (Figure 8.3) by Adalian 2011.



CONCEPT IDEATION CHART V6										
BODY TYPE/FEATURES	ECTOMORPH	MESOMORPH	ENDOMORPH	AGE	ENVIRONMENT	TEETH	POSTURE	PROPS	SKIN	NOTES/BACKSTORY:
	Thin	Broad shoulders	Soft body (fat)	Old	Nocturnal	Bad	Slouched	Shoes	Scars	Quadraped, Hell hound
	Small bones	Narrow waist	Round shape	Middle aged	No air	Sharp	Upright	Clothing	Fur	
	Flat chest	Mature look	Round face	Young	Jungle	Goofy		Jewellery	Feathers	
	Youthful look	Strong	Short neck		Mountain			Gun/s	Armour	
	Light muscles	Large chest	Low muscles		Cave			Knife/s		
	Little body fat	Long torso			Sky					
	Tall	Thick skin			Volcanic					
					Urban					
<u>MOBILITY</u>	WALK	SWIM	SLIDE	CLIMB	GLIDE	DIG	WHEELS	FLOATS	TELEPORT	
<u>TYPE OF CHARACTER</u>	REPTILE	HUMANOID	INSECTOID	MECHANICAL	EXTRA TERRESTRIAL	AQUATIC	EARTH BOUND	AMPHIBIAN	AVAIAN (BRID)	
<u>PERSONALITY / ATTITUDES</u>	AGGRESSIVE PEACEFUL	DISTANT WARM	ASSERTIVE PASSIVE	DECIVER HONEST	DEPRESSED ISOLATED	FUNNY SERIOUS	INSANE SANE	EXTROVET INTROVERT	ADVANCED BACKWARD	
<u>CHARACTER ARCHETYPE</u>	PROTAGONIST	ANATAGONIST	REASON	EMOTION	SKEPTIC	SIDEKICK	GUARDIAN	CONTAGONIST	SOLDIER	
<u>SYMBOLIC ARCHETYPE</u>	LIGHT VS. DARK	WATER VS. DESERT	HEAVEN VS. HELL	MAGIC WEAPON	WISDOM VS. STUPIDITY	SUPER NATURAL	FIRE VS. ICE	INNER BATTLE		
<u>SITUATIONAL ARCHETYPE</u>	THE QUEST / THE TASK / THE JOURNEY	THE INITIATION	THE FALL	DEATH/REBIRTH	NATURE VS. MECHANICAL WORLD	GOOD VS. EVIL	THE UNHEALABLE WOUND	THE RITUAL		
<u>NAME IDEAS</u>										

Figure 8.5 The sixth iteration of the ‘preparative ideation chart’ and the accompanying sculpture outcome, overleaf by Adalian 2011.

Figures 8.6 & 8.7 The outcomes of my sculpting practice from using the sixth iteration of the 'preparative ideation chart'. (Figures 8.5) by Adalian 2012.





Figures 8.8 by Adalian 2012.



Figures 8.9 by Adalian 2012.



Figures 8.10 by Adalian 2012.



Figures 8.11 by Adalian 2012.



Figures 8.12 by Adalian 2012.



Figures 8.13 by Adalian 2013.



Figures 8.14 by Adalian 2013.

Appendix four – Further outcomes of practice from cycle three.

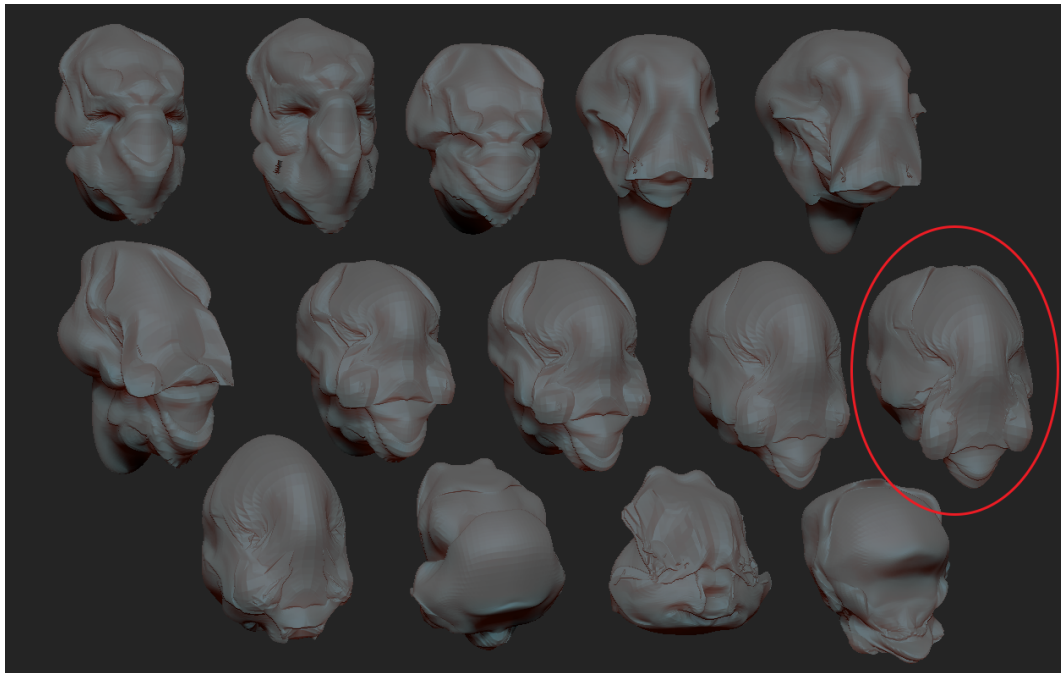


Figure 9.1 Thumbnailing technique that led to the sculpture shown in figure 9.2. (The thumbnail circled in red was the basis for this sculpture) by Adalian 2013.



Figure 9.2 by Adalian 2013.

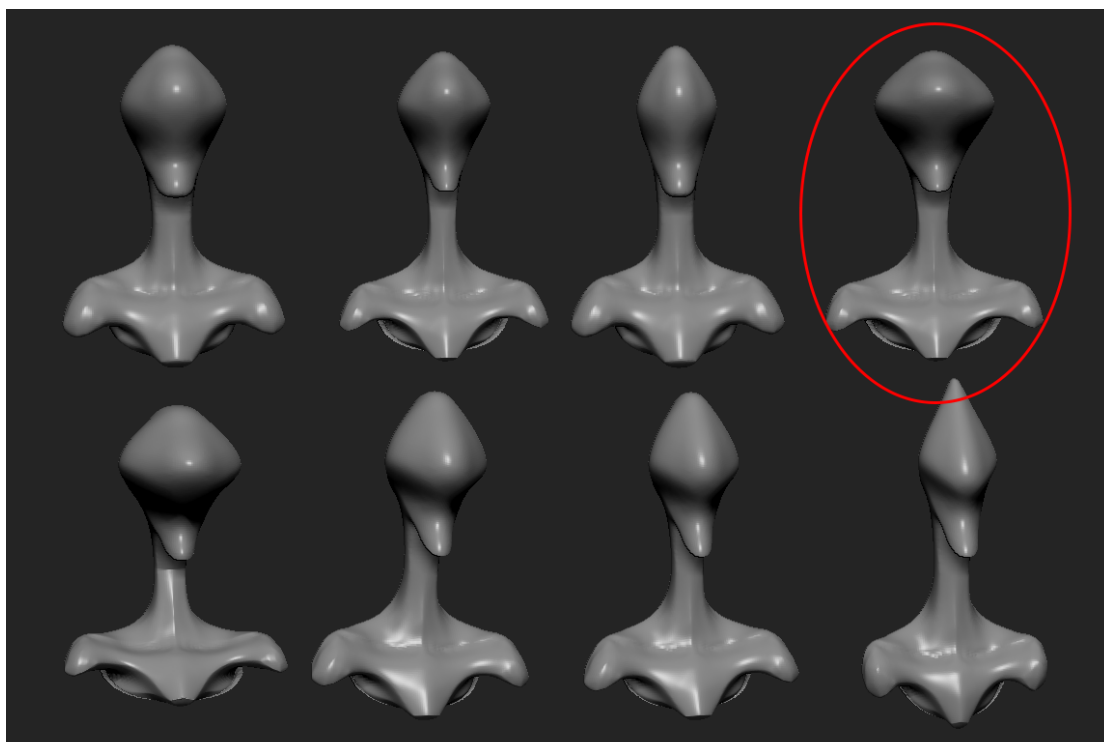
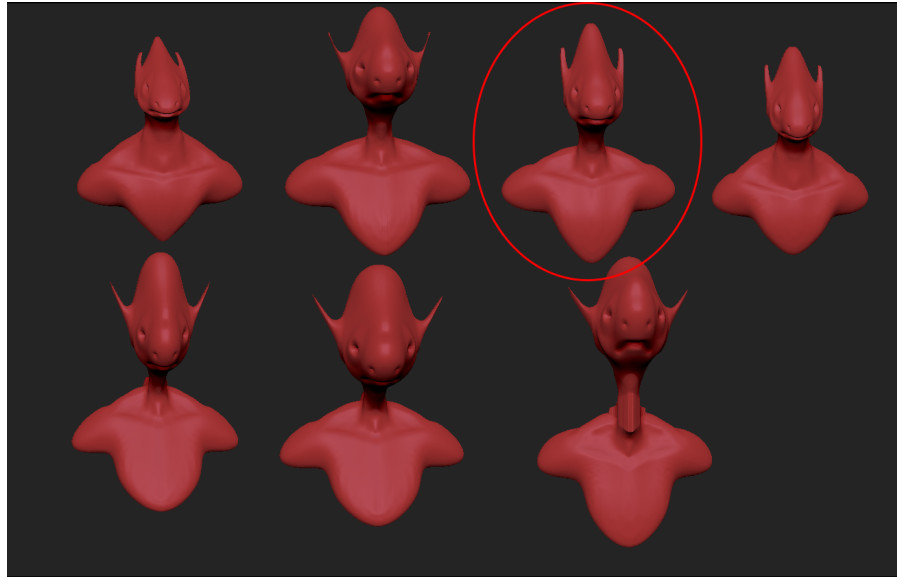


Figure 9.3 Thumbnailing technique that led to the sculpture shown in figure 9.4. (The thumbnail circled in red was the basis for this sculpture) by Adalian 2013.



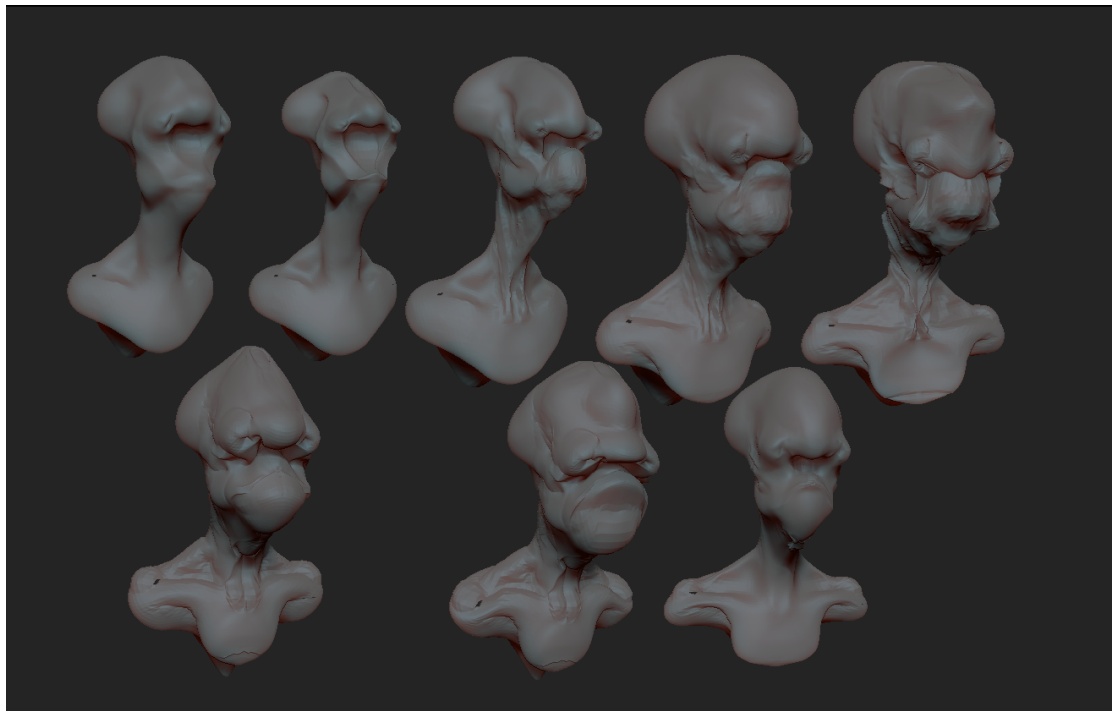
Figure 9.4 by Adalian 2013.



Figures 9.5 by Adalian 2013.



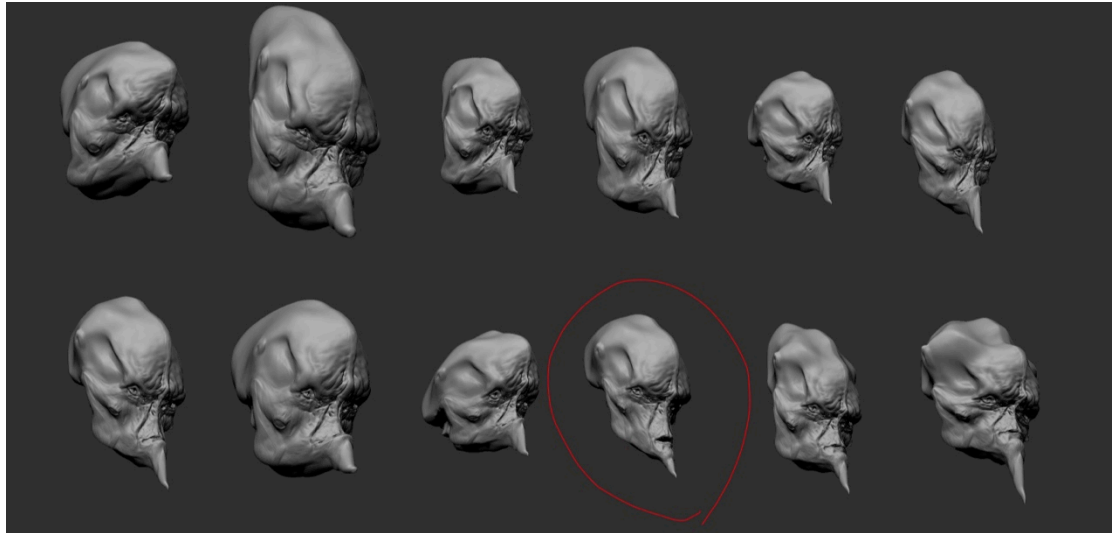
Figures 9.6 by Adalian 2013.



Figures 9.7 by Adalian 2013.



Figures 9.8 by Adalian 2013.



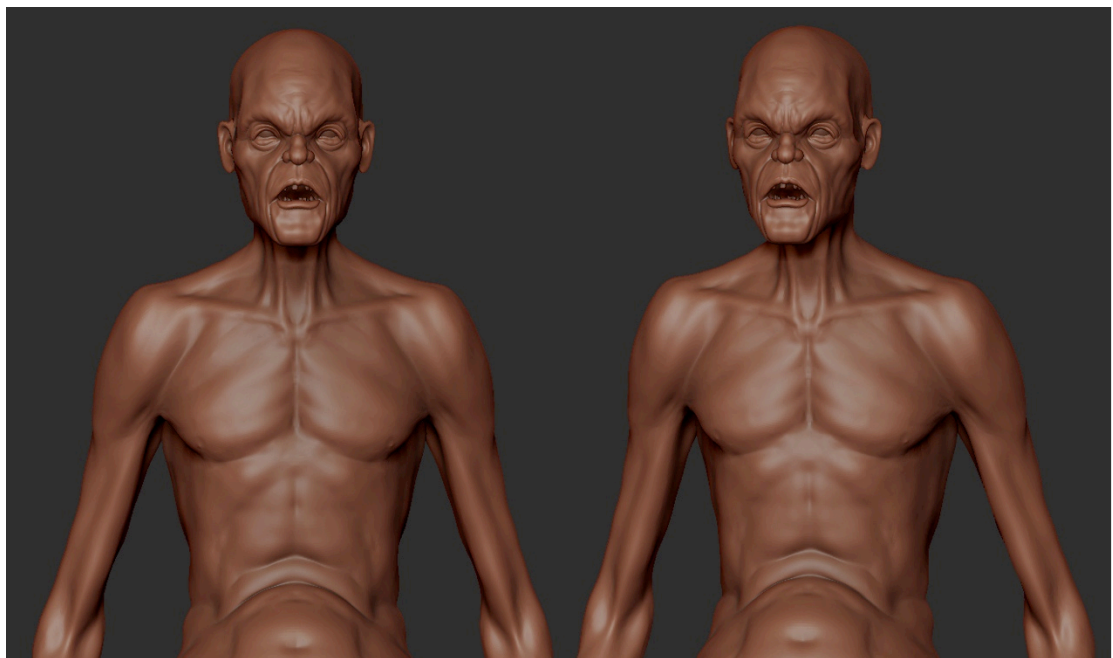
Figures 9.9 by Adalian 2013.



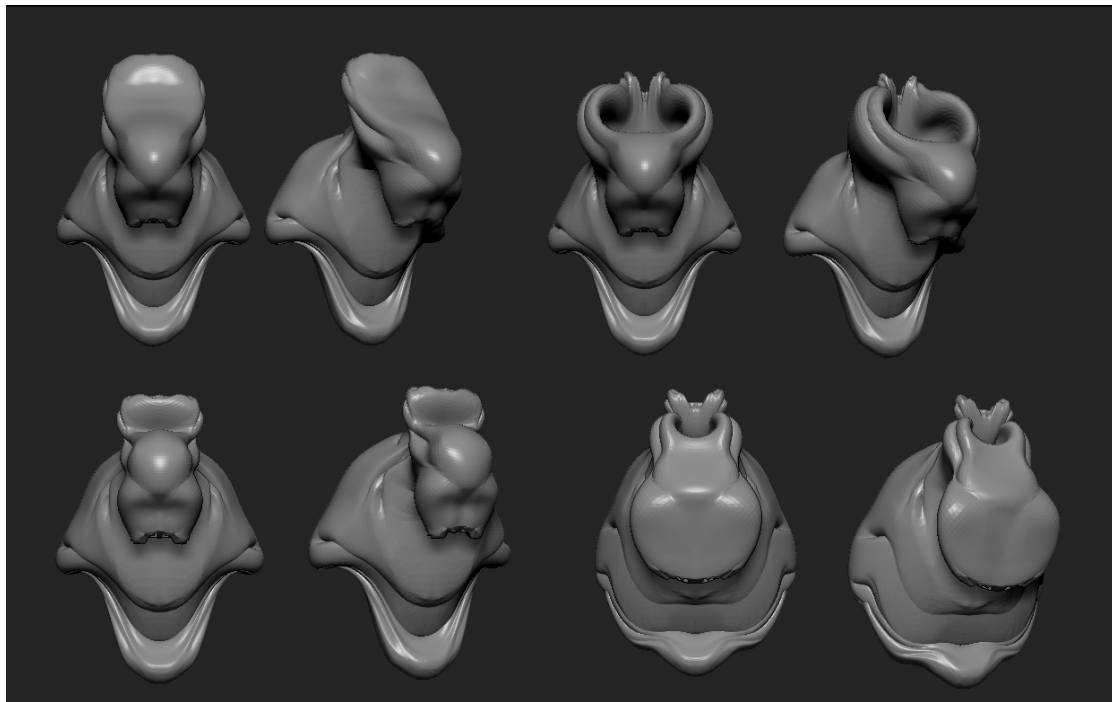
Figures 9.10 by Adalian 2013.



Figures 9.11 by Adalian 2013.



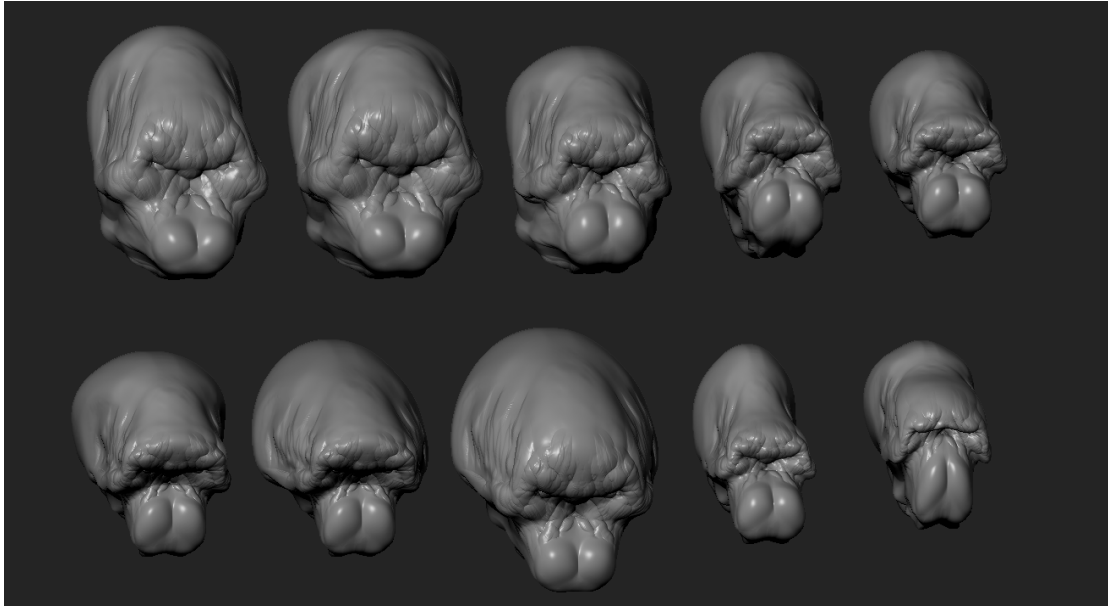
Figures 9.12 by Adalian 2013.



Figures 9.13 by Adalian 2013.



Figures 9.14 by Adalian 2013.

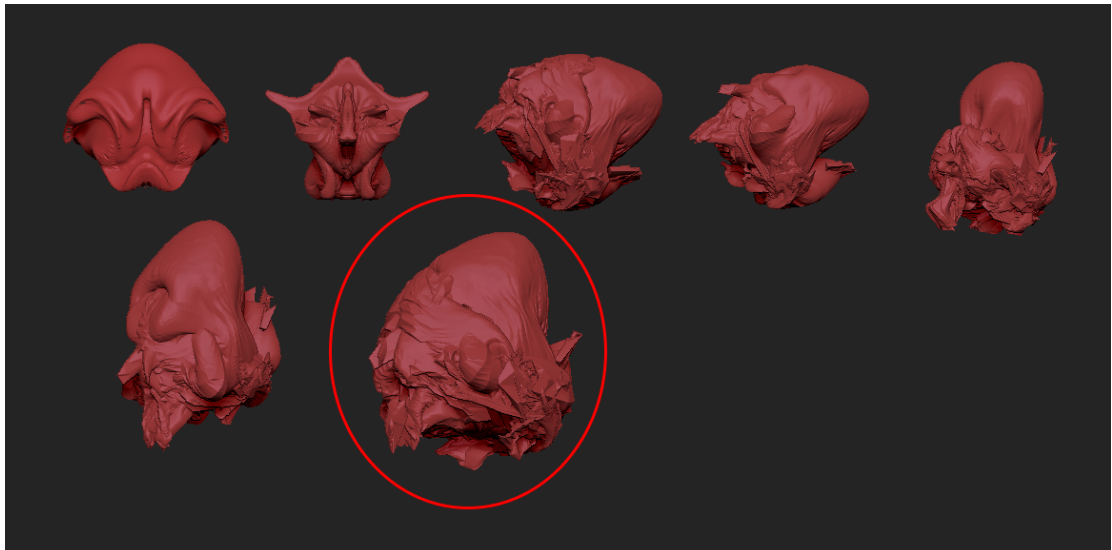


Figures 9.15 by Adalian 2013.

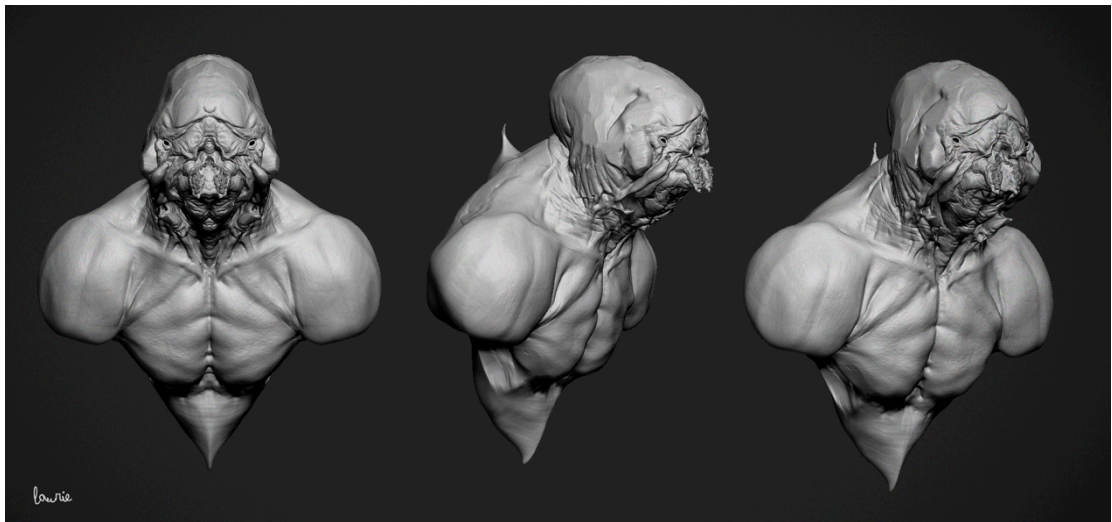


Figures 9.16 by Adalian 2012.

Appendix five – Further outcomes of practice from cycle four.



Figures 10.1 by Adalian 2014.



Figures 10.2. by Adalian 2014.



Figures 10.3 by Adalian 2014.