

**Animating Material:
Exploring Spatial Vitality through Performative Textile**

By

MO LUO

BFA Academy of Art University, 2011

Supervisor: Maxe Fisher

A CRITICAL AND PROCESS DOCUMENTATION PAPER SUB-
MITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF

MASTER OF DESIGN

EMILY CARR UNIVERSITY OF ART + DESIGN

2019

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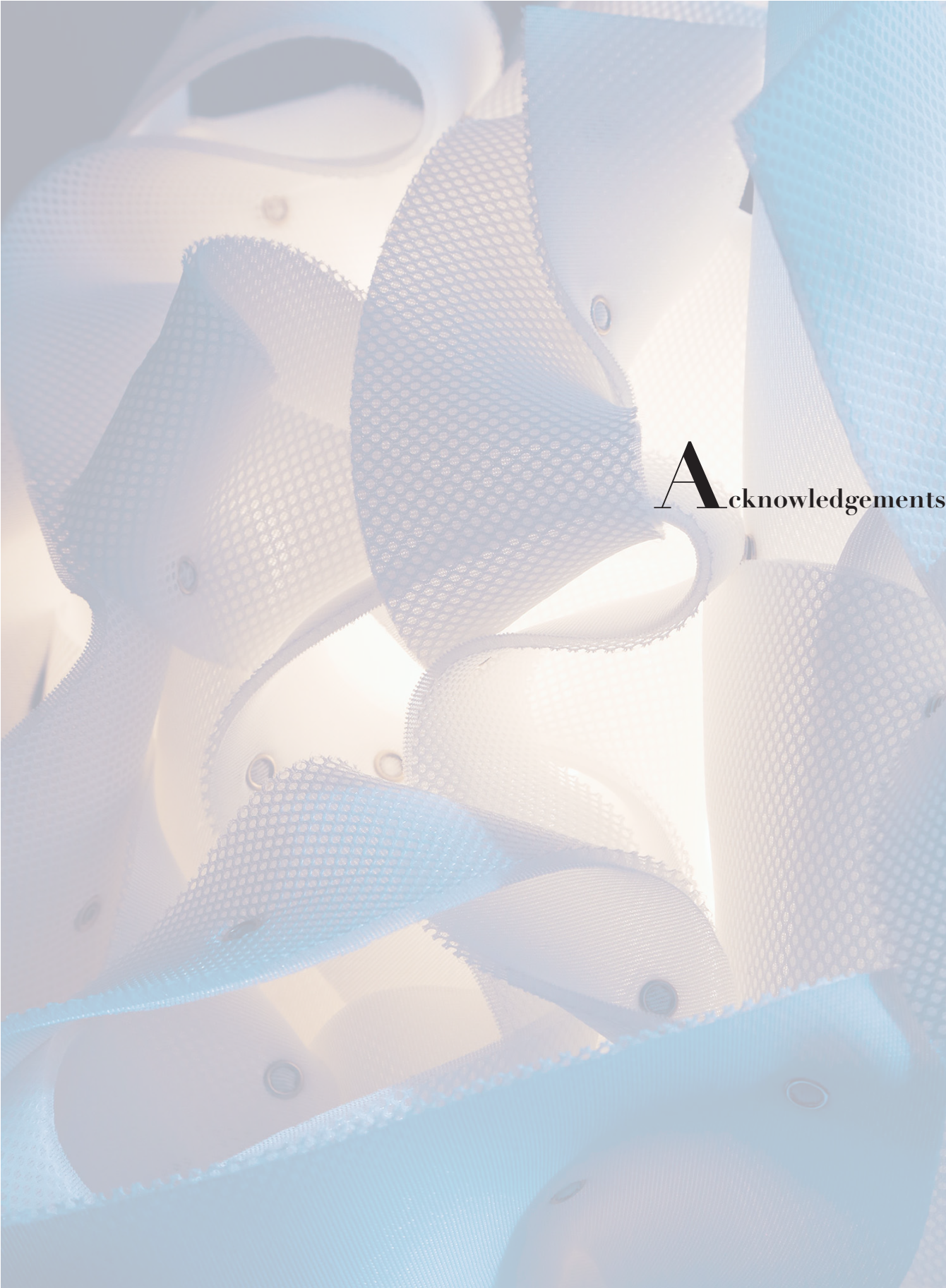
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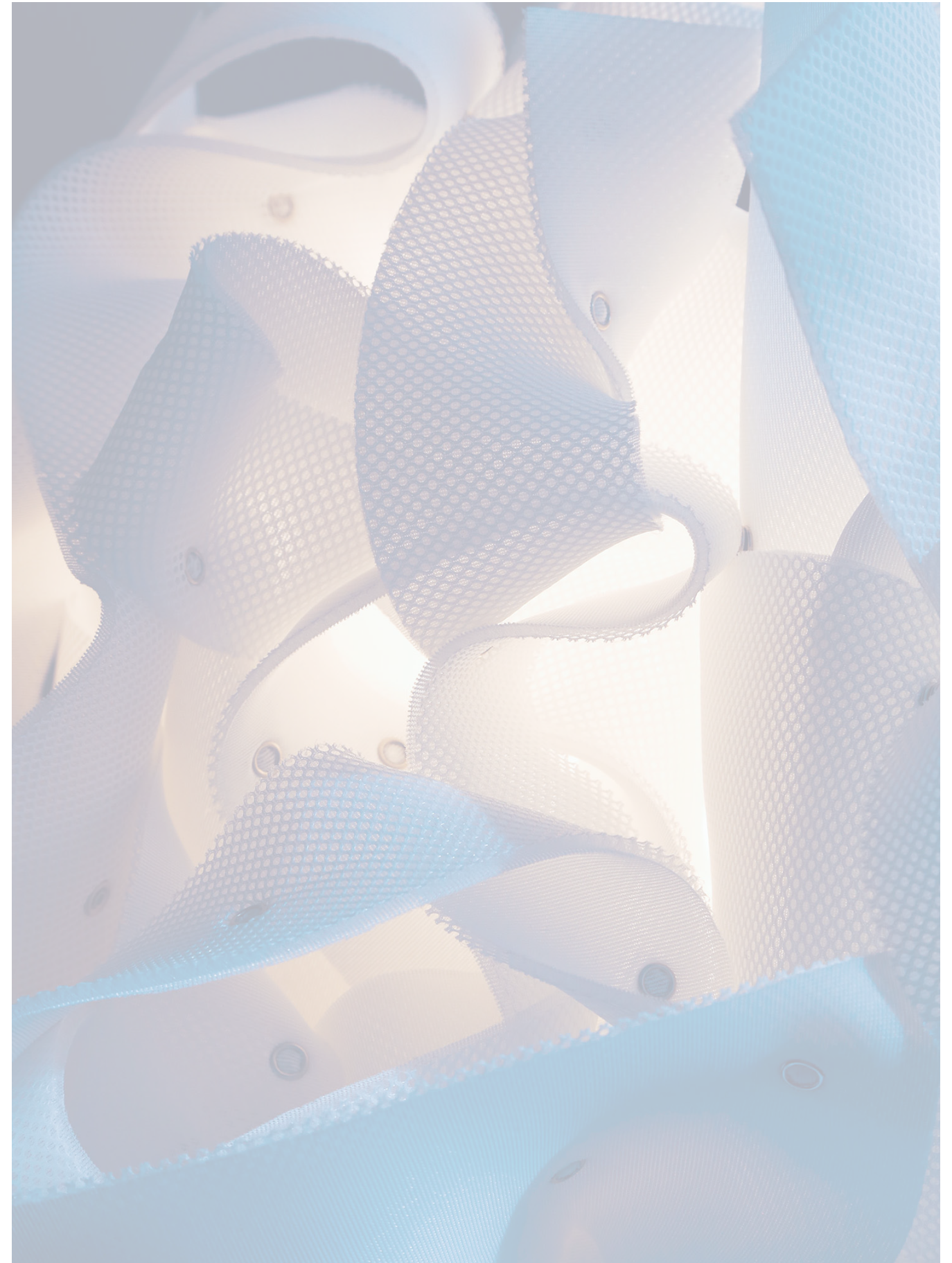
To myself, for all the efforts and irreplaceable memories that I had during my graduate study. Thank you for never stopping the creation, always being curious about the world, and never giving up.

Notes to the reader

VI

The structure of this thesis is made up of two parts:

- “Thinking through Making: A Journey of Designer Thoughts” which introduces and articulates the design context, method and theoretical framework.
- “Material Exploration: Learning from Making” which is presented as one series with seven volumes of documentation and critical reflections of the graduate studio design research works.



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Axiology

It is a research philosophy concerned with values, which includes aesthetics and ethics, and the process of research. Axiology plays an integral role that will elevate the awareness of any value judgements that the research would make at the conclusion phase (Collins, 2015 p37). In this research, it is used to interpret the process of “Doing(见众生)”.

Draping

Draping is a term that is used in fashion to describe “the process of transforming a clothing design into a three-dimensional form” (Francesca, 2013). In this research, draping is adopted familiar technique, as a fashion designer introduced to others, people who does not have fashion background. It is the design language and tacit knowledge in the action of making and as an alternative way of thinking.

Epistemology

“Epistemology is the study of the nature of knowledge within a field of study... Understood more broadly, epistemology is about the creation and dissemination of knowledge in particular contexts.” More narrowly it concerns the study of knowledge and justified belief (Collins, 2015 p36). It is a philosophical theory that is incorporated to interpret the research process of “Knowing(见天地)”.

Hylozoism

“Hylozoism” is a Greek word that combines two words which are ‘hylē’ which means matter and ‘zōē’ which means life. (Beesley, 2010 p13)

Ontology

Ontology is the philosophical study of reality and the nature of being. “This raises assumptions about the way the world operates, and the commitment held to particular views by researchers” (Collins, 2015 p37). It is a philosophical theory adopted to interpret the research process of “Being(见自己)”. In this design research, an ontology was considered to understand the subjective reality of people and to understand their motivations and actions in a meaningful way (Collins, 2015 p37).

Open Specificity

A design concept that is applied to the design practice as a design framework. It is used as a means to develop interactive activity between participants. Following insights from Ramakers, Moors, & Betsky. *Open Specificity* proposed unexpected and uncertain conversations. “Open=undefined; specific=highly defined.” (Ramakers, Moors, & Betsky, 2006, p54)

Material Reflective Research

A research methodology framework that consists of two parts: initial literature review and progressive circulatory research exploration.

Participants

Participants were people who were interested with the design and were willing to make, share and communicate in the exhibition space. This differs from the viewers or audiences in a traditional gallery setting concept where touch is generally forbidden. They were encouraged to engage with the design work. They are not passive observers; they have an integral role within the research as active participators. In the research, participants contribute to the vitality of a space by engaging with the performative textile.

Performative Textile

A site of textile-based artifacts that responds to people’s movement, gestures and actions.

Phenomenological Experience

Phenomenology, “accepts the social constructionist understanding of the interrelationship between human being and objects in the world and seeks to offer a meaningful reflection on the nature of our world. It is a critical paradigm and calls into question what we take for granted in order to construct new understandings” (Collins, 2015 p40).

The research applies a phenomenological approach as a way to describe the process of interactive participatory experience. This experience for people through the material experiment developments creates this opportunity. It offers people to make through their own acts, to engage with the material, and to align their own narratives with their own interpretations.

Practice-based Research

It is a form of research that focuses on the creative artifact as a basis for the contribution to knowledge.

Practice-led Research

A form of research that leads primarily to new understandings about the practice. This type of research is an original investigation undertaken in order to gain knowledge and understanding of the researched topic.

Spatial Vitality

A sensation described as an environment which promotes the interaction between people and artifacts to inspire a rich, dynamic atmosphere.

Tacit Knowledge

It is knowledge that is hard to transfer to another person by writing or verbalizing its meaning. With this research, the tacit knowledge refers in particular to the draping techniques used in fashion design development which was applied throughout the experimental material practice.

Thinking through Making

A learning process for people to begin an understanding of things through the making of things.

Vitality

A word to describe the movement, energy and the dynamic in the research.

KEY WORDS

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- Draping
- Vitality
- Material Exploration
- Dynamic Lighting
- Interactive Experience
- Tacit Knowledge

ABSTRACT

The scope of my graduate thesis identifies and explores design strategies to consider how the manipulation of textiles can stimulate engagements between humans and the materials they engage within the built environment. The experimental installations of the research seek to encourage interactions between people and textile-based artifacts to contribute to the consideration and formation of dynamic spaces. This research investigates how to provoke gestures of makers and non-makers through interactive designed artifacts that occupy a determined space. The adaptability of the artifacts are created within the installations, simultaneously dynamic in both time and space, which elicit corporeal actions. Through time spent with the materials in a determined space, participants access and align the forms they create with their own narratives and musings.

The majority of the material experiments within this research focussed on design within a textile architecture. Structural forms with spatial implications emerged from the experiments. More specifically, the concept of spatial vitality was explored through responsive textile forms and artifacts with lighting. A *Material Reflective Research* approach was developed in the early stages of the design process, which later shifted from an emphasis on practice-based research to practice-led research. The research described

started with a dominant lean towards an internally focussed material exploration of the designer and evolved to an approach that sought to create interactive experiences for people. Throughout this process, a wide range of materials and techniques were explored as means for spatial vitality to occur between the maker and the material. The outcomes of this process took the form of a lighting installation for people to experience a transformation of their imagination within the space of the design.

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This study not only addressed the significant contemporary design issue of the complex relationship between people and objects, but also aimed to gain a deeper and more meaningful understanding of materiality through design and action in a poetic space of performative interaction. Through the design of a multi-sensorial lighting installation people were invited to engage and to respond through various actions, gestures, and movements, expanding the experience beyond vision. This interrelationship between participants and artifacts intends to enhance an awareness and appreciation of life, both of theirs and artifacts. *Animating Material* connects people with designed artifacts, such that a passive observer could become an active participant in a dynamic and symbiotic reciprocity, a conversation with performative textiles.

Thinking through Making: A Journey of Designer Thoughts

I believe all matter has life and all life matters.
I believe in the symbiotic relationship between
humans and artifacts.
Humans act.
Artifacts respond.

The design research *Animating Material* focuses on exploring performative textiles in a spatial lighting installation. These environments are intended to evoke a dialogue between a person and the material world whilst stimulating and incubating dynamic connections of making and interactive actions. In fall 2017, my Master studies exploration was initiated by manipulating materials into new configurations: three-dimensional structural artifacts were created as extremes of scale to bring about spectacular effects and achieve unconventional outcomes (Newell, 2007 pp). These spatial experiences with material are nearly always the intrinsic manifestation of human behaviours and the empathy that occur (mine and others). This as *interactional vitality*.

Creating a performative textile-based installation, made from the act and actions of making and is responsive to the light have been integral to my practice. *Light of Thoughts* illustrates this. My own making aimed to capture the vitality of dynamic lighting. This work also provided a shift in my approach. Constructed of individual material pieces that could be assembled in various ways to create diverse lighting and shadows, *Light of Thoughts* injects an insight into the expectations of an animated artifact. An artifact that composes form by working with light and its varying degrees of brightness

through different densities provided by the layers of fabric. The incorporation of a simple snap fastener connection system enhanced an intuitive action-response from participants. Inversely, the design applies complexity as a means to invite people to engage. The scale of the artifacts provided affords infinite possibilities of gestures and interactions of the participants. Significantly, this move to providing potential affordances to build and create a multitude of form possibilities brought about unexpected responses from participants. Their interpretation of functionality and purpose of the mutable artifact has challenged any preconceptions.

At the onset when people interact with the installations within the space, it was envisioned that the whole experience would create diverse and unique conversations between humans and artifacts to communicate a sense of time and space. The anticipation of this research is to offer a new interpretation of materials and their capacity. Not only does the research create a poetic space that draws in people to engage with materials and interact with the artifacts, it also brings about an awareness and an appreciation of human creativity and the enormous vitality contained in a dynamic materiality. The section *Light of Thoughts* will discuss the degree to which this anticipated behaviour occurred.

A Conversation

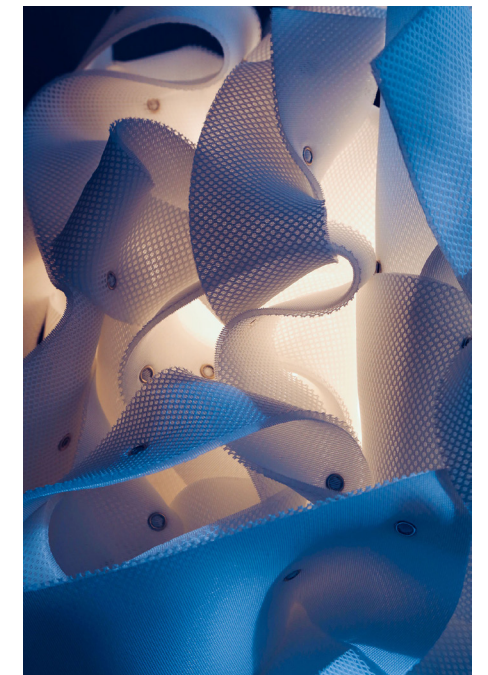


Figure 1. *Light of Thought* detail.

All Matter has Life^[1]

A common man marvels at uncommon things; a wise man marvels at the commonplace.

CONFUCIUS

From a practice-led research perspective, there are many artists, designers, and makers who not only experiment with multi-sensory application in projects, but also attempt to create responsive environments that encourage a mutual relationship between artifacts and participants. For example, Philip Beesley's massive installations of passive interactive kinetic systems focus on immersive digitally fabricated lightweight 'geotextile' structures (Beesley, 2010a). Hélio Oiticica is known not only for his artworks that arouse in us an awareness of our bodies, senses and feelings about being in the world, but also for his artwork that challenges and encourages people to become more active as participants in every part of his work (Whitney Museum of American Art, 2017). Inspired by Beesley and Oiticica's works, the thesis work elaborates on the use of the invitation as a means to draw participants in. Throughout the research experiments, this concept was considered as means to convey the potential reciprocity between the designer and participants to endow the artifacts with dynamic meaning.

Philip Beesley is a Canadian artist and architect. His research and explorations focus on responsive architecture in the form of immersive and interactive

environment. His dynamic architectural installations, *Hylozoic Soil* (2007) generate an environment that can actually 'feel' and 'care.' In his project *Hylozoic Ground*, Beesley conceived and constructed an environment as a living system that "allowed human interaction to trigger breathing, caressing and swallowing motions and hybrid metabolic exchanges" (2010, p.13). The project's title 'hylozoism' describes the ancient belief that all matter has a life (Etherington, 2010). Hélio Oiticica (1937-1980) was one of the most innovative Brazilian artists of the twentieth century (Whitney Museum of American Art, 2017). His work was multi-sensorial objects that surrounded the audience and engaged the audience's interaction within. In his earlier object-based works, Oiticica mainly focussed on the objects. And in his later artworks, the participation of the audiences became essential. During the exhibition opening at the Whitney Museum of American, Oiticica's work *Hélio Oiticica: To Organize Delirium* (2017) invited people into his textile structures and encouraged interaction, which was an extremely radical and bold move during an official exhibition. According to Elisabeth Sussman, one of the curators of this exhibition, described in an interview, "Oiticica tried very much to bring the spectator into a more if not precisely

tactile, where they were touching the work of art, but at least moving through the work of art, moving close to the work of art, being reflected in some areas of the work of art" (Whitney Museum of American Art, 2017). The exhibition of Hélio Oiticica: *To Organize Delirium* is not only "communicated through the user's experience and emphasized the dynamics of life" and was "in opposition to attempts to see the world as something systematic and static" (Agkathidis & Schillig, 2011 p10).

My world view is influenced by Confucius teaching. I believe that all matter has life and all life matters. Akin to Beesley and Oiticica, the intention of the research through the engagements with the designs is that people will subsequently pay more attention to their surroundings or at least be reflected in some circumstances with the design works, referring to what Sussman described above. In the case of the spatial lighting installations, a site was created for people to be drawn in, to have a new and deeper understanding of themselves, and to marvel at what Innes refers to as the commonplace (Innes, 2012, p6). The commonplace, Innes notes is connected to materiality and its manipulation (Innes, 2012, p6). As such, my design is never about looking at. It is always about being in.

[1] Subtitle named from Etherington, R. (2010). *Hylozoic Ground* by Philip Beesley. *Dezeen: Next Story*. Retrieved from <https://www.dezeen.com/2010/08/27/hylozoic-ground-by-philip-beesley/>

Draping: A Language of Design

5

My background is fashion design. This has involved a particular set of experiences and training. In my case, I would consider myself as a “draper” more than a “flat-pattern maker”. During the design and construction of garments, I often start with draping^[1] my idea directly in three dimensions over a mannequin, building the fabric on a body, instead of sketching and designing patterns in two-dimensional form, drawing on flat paper. In this way, draping, which is to manipulate the fabric on a body, makes my design come to life. Through draping, a more interesting design reliably takes shape and form. Thinking and making in three-dimensionally provides a space for me to create with open-ended possibilities. It is a more tactile and responsive way to design that relies on intuitive responses to the space and the cloth and being in the moment. In this way, opportunities appear within this material process. “Unlike the two-dimensional pattern making process, draping allows the designer to get a ‘feel’ for the fabric as the fabric is draped on the form” (Francesca, 2013).

While thinking in three-dimensional space is definitely a more effective way for me to create a design, it also affects me deeply through connection and experience. When I am draping on a body, the body structure is still static and fixed to a certain [1]Draping is a term that is used in fashion to describe “the process of transforming a clothing design into a three-dimensional form” (Francesca, 2013).

degree. For instance, early on in the development of my project *Waving Jacket*, the fabric was draped on a fixed mannequin. As I was working on the project, I felt like the project needed more. It called out and required my focused attention. I responded through repeated manipulations and draping. I adapted my draping in order to respond to the materials, specifically to various types of the fabrics in different characteristic such as weight, texture and composition. This act of capturing and creating with the material was interactive, animated and it brought about outcomes through a symbiotic reciprocity.

Through draping, I have experienced the process of unpacking, embodying and transforming knowledge. Draping as an action, meaning to wrap and unwrap a body in textile, is made to manifest as tacit knowledge. Through a series of evolutions, this tacit knowledge becomes the leitmotiv of how I animate and experience material and is something I want to share.

Later in the development of *Light of Thoughts*, a dynamic and indeterminate structure was created to enable untrained drapers, people who passed by the installation, to respond to the material. The dynamic elements in this project included a lighting system, the textiles, all the connections and notions, and the configurable compositions of material, e.g. twisting and looping positions.

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Draping: A Language of Design

Fabric 1: soft and resilient;
Fabric 2: waterproof;
Fabric 3: cotton woven fabric with waffle texture structure

Paper: roll of white paper; thin and crisp; easy to fold; and easy to be wrinkled.

Bubble wrap: soft and squeezable; light and translucent; delicate and fragile.

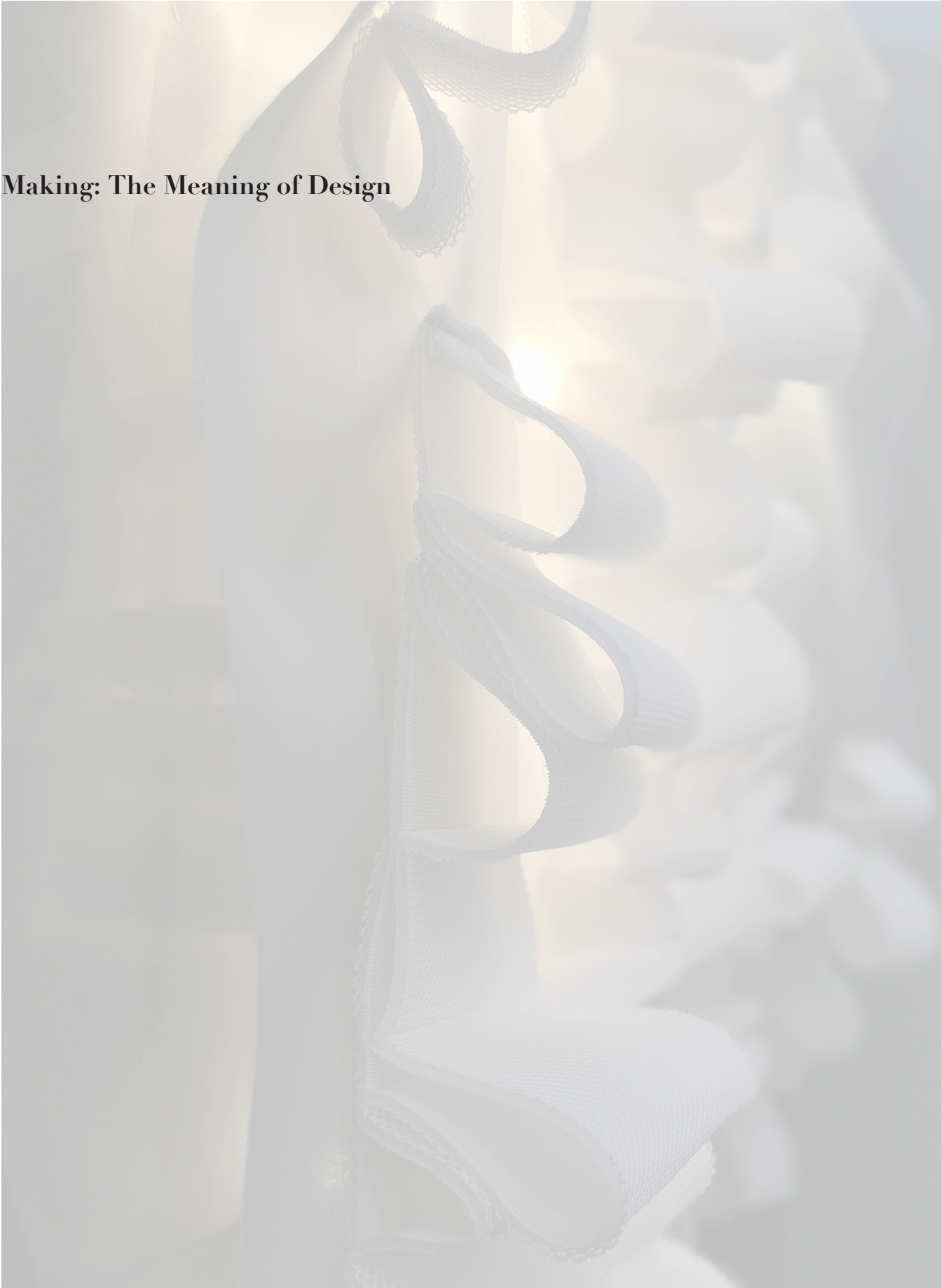
Plastic trim and Plastic straw: crisp and little stiff; iridescent with pore structure; light and easy to be wrinkled.

Foam fabric: spongy and soft; dense porous structure; light and flexible.
Copper wire: hard and structure; easy to bend.

Plastic table cloth: soft and resilient; translucent and reflect blue light; sticky and have a certain weight; smelly and easy to shape.

Fabric covered mesh: honeycomb fabric texture with inside spongy fabric form; light weight and structural; soft and permeability.

Figure 2. Material Swatch Book



Making: The Meaning of Design

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From a theoretical-research perspective, it has been discovered that the learning process starts by making things to know things. The British anthropologist and educator Tim Ingold illustrated a theory called “thinking through making” and “learning by doing”.

Making creates knowledge, builds environments and transforms lives...Making offers a series of profound reflections on what it means to create things, on materials and form, the meaning of design, landscape perception, animate life, personal knowledge and the work of the hand. (Ingold, 2013)

Ingold’s articulation of his theory of making not only actively supports this exploratory research but also sheds new light on the research to keep it evolving and progressing through materiality and process. Thinking through making generates knowledge

(Ingold, 2013 p1). Making as knowledge is a reflection on the profound meaning of creating things through materials and forms; making as a method helps makers make sense of the world through materials; making as a quintessential way of thinking defines the meaning of design (Ingold, 2013). Reflecting upon the thesis designs by building knowledge through making and making to know is a significant meaningful method addressed and adopted through the entire research process.

This research revealed that making is methodology and making is the meaning of design.

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Material Reflective Research

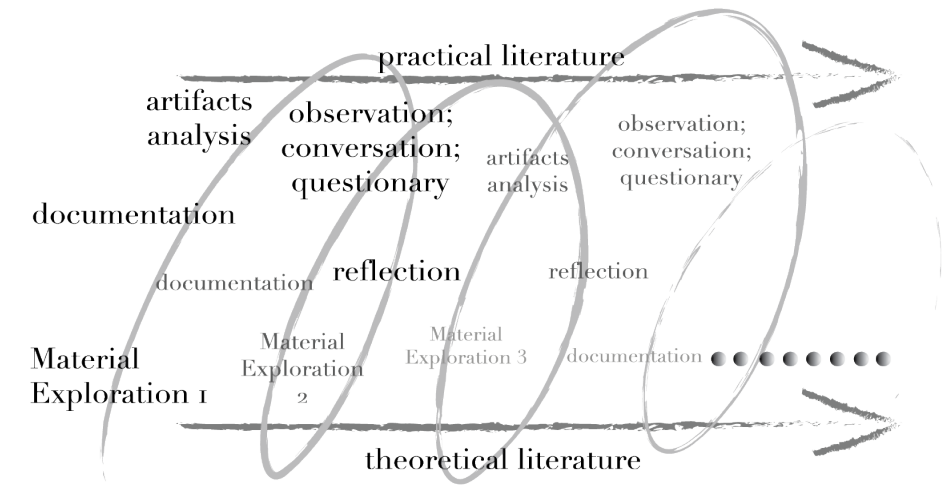


Figure 3. Diagram of *Material Reflective Research* method.

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Material Reflective Research is a methodology that was developed and refined in practice-based research as a starting point towards practice-led research. It only includes both theoretical literature and practical making methods to initiate and support the entire research process, it also informs my practice through cyclical planning, acting, observing and reflecting. These two categories of literature in both practical and theoretical, were meaningful to support and to influence the circulatory practice-based and practice-led perspectives. The research commenced with material explorations, which was then followed by documentation, artifact analysis, observation, conversation, and critical reflection.

The initial literature review provided an initial framework by looking into different perspectives both theoretical and practical, which would be threaded throughout the research process from the beginning to the end and would continue to influence future practice-led research. The re-circulatory research and practice progressed like a helix in between these two categories of practical and theoretical literature. Then the next loop starts by building upon what came before into further evolved possible material explorations of deeper and more effective reflections. The method of this research inspires a new spark of reflection, new understanding of the research, which would motivate new experiments moving forward (see figure 3).

Methods Explanation

I. Material exploration

A tangible creation process working through idea testing and material practice. It usually starts from materials, using a variety of skills to manipulate into 3D forms. Normally, it starts with small-scale or single unit that grows to a larger scale or multiple group units.

II. Documentation

The process of exploration by taking photos or videos and writing diaries to create a meticulous process record of every single step that has been taken in the development.

III. Artifacts Analysis

This is a reflection of the artifacts from other artists by collecting their works and ideas through different aspects of material analysis, aesthetic analysis, and interactive analysis. Collecting includes picture references, documentaries, interviews, lecture speeches or other archives. And

then recording my reaction and feelings about the design by diary writing.

IV. Observation

Monitor the working process and record my reactions and feelings by diary writing. Analyze the strengths and weaknesses, making adjustments or changes.

V. Conversation

It is a communication period that allowed me to review the design with my peers and get feedback from instructors from a designer's and participant perspective.

VI. Reflection

It is a full summary of the exploration process above all. It includes photos, videos, note-taking, diagrams, sketches, small samples and diary writing.

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Nature: An Influence for Design

As a designer, most of my design works are inspired by nature. Drawing upon meaningful parallels of material qualities of form, texture and colour experienced in the nature, these are explored with soft structural materials to create complex structures. These may seem both familiar yet inversely strange. The research looks to nature and specific forms of moving water, fresh mushrooms, canyons, and mountains, being intrigued by the abstract patterns found in these organic forms, such as the waves of the water, the veins of the mushrooms and weathered mountains, each a construct of layers or layering (see figure 4-7).

There are lighting designers who draw inspiration from natural forms by transforming the variation and beauty of nature. For example, David Trubridge, a trained naval architect and a self-taught furniture designer and woodworker, is renowned for his wooden lighting works that reflect upon the natural environment. One of his works, *Navicula*, is a pendant light covered with the CNC-cut bamboo lamp shade. The silhouette of this light is derived from one of the many microscopic diatoms that float around in the oceans. Even though this design was created and produced with thin bamboo plywood, it still captures

the flowing structure of the unique patterns of the organism (Trubridge, 2016). Trubridge achieve his aesthetic by using thin, light and flexible material to create this internal structure emphasizing the incredible array of life forms at the bottom chain of the oceans. (see figure 8-10)

Instead of directly capturing a certain natural phenomenon as concretely as Trubridge does, many of my design works draw inspiration from an aggregate collection of natural form and phenomena. The configuration of the lighting in the design work *Light of Thoughts*, for example, could be viewed as a stalactite suspended from the caves' ceilings, hot springs, or human-made structures. It is the epitome of a natural phenomenon. *Light of Thoughts* is not a closed circle with a single possibility. It is a phenomenological experience that opens up possibilities over time.

Nature: An Influence for Design

Images removal due to copyright

Figure 4-7. Inspiration images. Retrieved from *Pinterest*. (2017)

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Image removal due to copyright

Image removal due to copyright

Figure 8-10. Navicula created by David Trubridge and his inspiration image. Retrieved from <https://www.davidtrubridge.com/collection/lighting/navicula/>

Exploring Vitality through Materiality

The entire premise of the research is that *making to know* practice of material manipulations, combined with a *material reflective process*, is to give form to the dynamic lighting; and its sense of liveness. The light sources that surround us from the sun, the moon, and our stars to the aurora borealis and fire exist in constant movement and change. When humans trapped and captured light into any lighting source, the dynamic essence of light shifted from ever changing to a constant existence.

Can lighting design transform the quality of light? Can the movement of our bodies potentially contribute a dynamic influence over light? How could this occur? The practice of making that was delved into through a comprehensive knowledge of a diverse range of materials and techniques pursued a visual ambition to achieve luminous beauty (Innes, 2012 p188) within the lighting installation *Light of Thoughts*.

Through this work *Light of Thoughts*, the exploration of a materiality focus shifted from what had been developed into how people would engage. This shift not only brought the designer out of the material world with only designer and the material practice, but also provided involved opportunities and spaces to invite people's engagements within material culture. From the perspective of phenomenology, the research created a phenomenological experience

by providing an opportunity for people to engage and re-discover the material world around them. The phenomenological experience referencing Paul Dourish's definition in his book *Where the action is: The Foundations of Embodied Interaction* described "...a sense of 'phenomenological presence', the way that a variety of interactive phenomena arise from direct and engaged participation in the world" (Dourish, 2001 p115). This research explored spatial vitality as a phenomenon through materiality as a lighting and textile interaction.

Lighting designer, artist, and educator Malcolm Innes describes the effects of light in this way, "light reveals colour and three-dimensional form, while directional plays of light expose the texture of surfaces and materials" and expresses its their integral role in our appreciation of spatial design (Innes, 2012, p6). He also mentions that "light has the power to influence the mood and atmosphere of space" (Ibid, 2012, p6), through the emotions and sensations experienced in the designed lighting patterns, shades, and/or colours. "Light is intangible and immaterial, which seems to imply that is also uncontrollable" (Ibid, 2012, p6). The research treated light as soft material similar to fabric, yarn, and thread.

Light plays a significant role in the design in the research to evoke actions from the participants. These actions generate subsequent changes in the overall

form installation and influence the characteristics of the lighting and the shadows as a result of an unpredictable experimentation through movements and gestures.

...great lighting can only be created through good design practices and a deep understanding of light and its visual and psychological effect on humans. Designers who can see beyond the technology and the 'next great invention' hype of the industry and instead view the output of those technologies the light itself as their medium will be the kind of people who can transform our built environment into a glorious feast for the senses. (Innes, 2012, p188)

Being, Knowing and Doing

19 From a western philosophical perspective, life has different phases, but in the end, life can be divided into three components: being, knowing and doing (a phronesis approach coming from ancient Greek philosophy). According to the *Aquileana* website, this phronesis is best acknowledged as a reference from “The Nicomachean Ethics, Aristotle (384 /322) describing three approaches to knowledge. In Greek, the three are episteme, techné and phronesis. Aristotle classified the three different types episteme (scientific knowledge), techné (skill and crafts) and phronesis (wisdom)” (*Aquileana*, 2014).

From an eastern philosophical perspective, there is also a description of three stages in the practice of Kongfu. In the Hong Kong-Chinese martial arts drama film “The Grandmaster”(2013), internationally renowned Hong Kong filmmaker Wong Kar-wai explains his ultimate philosophical thinking on

human beings “见自己，见天地，见众生”^[1] which directly translated into English as “Seeing yourself, seeing the world, and seeing people”. Reflecting upon my design process, I elaborated this philosophy into this phase which is about: self-exploration, material experimentation, and engagement between people and artifacts:

Be yourself. In this self- exploration phase; you see yourself, know yourself, and understand yourself.

Know this world. In this material experimentation phase; one begins to fully learn, experience, and experiment within the material world.

Do something. In this engagement development phase; it is for people and for a better understanding of the material world and for a deeper investigation of the relationship between them.

[1]The scripts from movie “*The Grandmaster*” (2013)

Furthermore, my research seeks to describe a close analogy with the research philosophies of ontology epistemology and axiology (see each definition in *Glossary*). The research began through the study of knowledge, then the exploration, creation and transmission of knowledge in a specific design context(ontology). Next, I went on to search for the meaningful ways to understand the motivations and actions of the participants(epistemology), and finally, to draw conclusions with respect to the design values, including those of aesthetics and ethics (axiology) (Collins, 2015 p36-37). Critical thinking throughout the design is important to situate it within this broader context in order to have an ultimate conversation derived from actual human behaviour.

From a micro point of view, the intention is for an evocative action to reach a new quality of spatial empathy which is not prioritized by observation, but by the intervention of participants through haptics.

This experiential interaction of the body with the materials (Agkathidis & Schillig, 2011) embodies the meaning of making and the making of meaning. More importantly, the intentions are for these exploratory actions to achieve a useful fulfillment through material practice to express and embody the meanings for this responsive, dynamic, and spatial materiality to exist.

An Open Ending

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“Everyone is an original” (Ramakers, Moors, & Betsky, 2006, p54) and every experience is unique. Architect Jvant Spijker discussed his two theoretical design attitudes which provide total opposite participant experiences: “closed and open specificity (open=undefined; specific=highly defined)”^[1](Ramakers, Moors, & Betsky, 2006, p54). Closed specificity does not offer much space for interpretation, while open specificity directs space for everyone’s own comprehension. “This level of freedom defines its attractiveness” (Ramakers, Moors, & Betsky, 2006, p60). In the overview of my design works, *open specificity* emerges through the design practice to develop and understand this interactivity so as to [1]“The concept ‘open specificity’ is related to the openness of artworks as a discussed by Umberto Eco in The Open Work. In this book, Eco describes how certain artworks expect an interpretation for the ‘consumer’ in order to be seen to full advantage. Umberto Eco, the open work, Trans, Anna Cancogni, rev.ed., 1989” (Ramakers, Moors, & Betsky, 2006, p65)

propose unexpected and uncertain conversations. *Light of Thoughts* is a collection not only designed to be a product, but to inherently embody the qualities of open specificity as perceived.

The distinction between open and closed forms of specificity is the degree to which the perception of these is prescribed or predetermined. In other words, in a case of open specificity, the experience that the concept might trigger is not hinted at, even though it is indeed present. (Ramakers, Moors, & Betsky, 2006, p60)

Instead of the designer attempting to control the artifacts to be perfectly planned, it is for design to meet in between “open” and “closed” specificity and to find a balance in a shared symbiosis to communicate the experience of the viewers/participants/wearers.

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Furthermore, instead of asking the viewer only to observe, each viewer is invited to become a participant. They become integral to the design work and contribute to the actual ‘ephemeral’ design. The research aims to establish a point of balance between controlled design intention and open-spaces for participants. A new embodied sensibility emerges through the interactive possibility within the design. The contribution to the *open specificity* is when the participants become the final receivers of the whole design process (Ramakers, Moors, & Betsky, 2006, p60). In order to approach this limited information, *open specificity* provides a more authentic space of curiosity and ambiguity as an unexpected side effect (Ramakers, Moors, & Betsky, 2006, p61).

E

xperimental Exploration: Learning from Making

Being: 见自己

Living with my studio work.
I am looking for materials and searching for possibilities.
I asked, I looked, I touched, I thought.
I cut, folded, tore; I held, tied, sewed.
I pinned it, drilled a hole and bonded.
I took it all apart and I put it all together;
I added, layered and piled.
I squeezed, expanded and crushed.
I tried, explored and made them and through this I understood who they are.

Knowing: 见天地

Living with you in the studio.
I materials exist everywhere and showing potential.
I answered, I looked back, I surrounded, I reflected.
I was scissored, doubled; I lay, roped, stitched
I was attached, punched and united.
I was separated and combined;
I grew, stratified and accumulated.
I was crushed, extended and shattered.
I proved, examined and transformed, became who I wanted to be...

Doing: 见众生

Participating with your work in the exhibition.
I was invited and I accepted it.
I picked up the materials and formed it.
I wrapped around the light bulbs and sometimes made knots.
I created a unique structure and used it to hold a pencil.
I tried to unite the material and I tried to undo it.
I hid, shaded, undressed, and delighted the light.
I felt free and excited, fun and playful.
I felt overwhelmed and calm.
I loved it, for life.



Figure 11. *Living with my studio work* a photograph from studio.

Thesis Project Series: *Living with My Studio Works*

Living with my studio works is a series of experimental explorations in the evolution of my studio works. There are seven volumes: *Waving Jacket*, *Paper Land*, *Bubble Rain*, *Marine Life*, *Soft Concrete*, *Memory of Future* and *Light of Thoughts*. Each volume has their own characteristics and story to tell in a chronological order. They are not only present as a diverse range of material experimentation through a variety of techniques, but they also shared a similar spirit their vitality that emerged in a dynamic crowded space.



Figure 12-13. Volume 1 *Waving Jacket*

Volume 1

This project started with an old denim jacket as the base garment. At the back part of this garment, I deconstructed by cutting out the lower half of the back and reconstructed by weaving different types of fabric. At the front of this garment, I manipulated the curving pieces and layered them together by hand, sewing them together with a little stitch at the centre and attaching each layered unit at the front of the garment in a spatial layout.

Inspired by the deep denim blue, I experimented with the waving pieces to emphasize the movement of flowing water by layering them together to create the dynamic movement. I emphasize the rhythm through the repetitive but slightly different layers of the curvy patterns. Unlike straight lines and angular shapes, curvy lines carry continuity and circularity. Trace these curves in nature, like the water wave and the rippling-wheat-shaped.

Waving Jacket

Clothes are “close friends” to us. They cover us, present our identities and lifestyles. Sometimes they are not merely objects outside of our body, they are living in our life and become part of our life. So, in this case, they are not a static form, they are a living form that surrounds us. Looking from another side, discussing people and clothes together is essential. These are two different approaches in opposite directions when the jacket hanging on the rack and when people are wearing it. Although the curvy layers and the interlaced back created a dynamic atmosphere, when people are wearing it, every single movement and tiny gesture even the beating of the pulse are illuminated and bring the jacket new meaning of life.

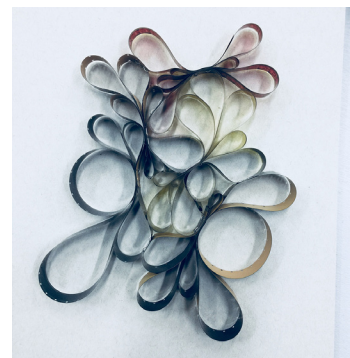
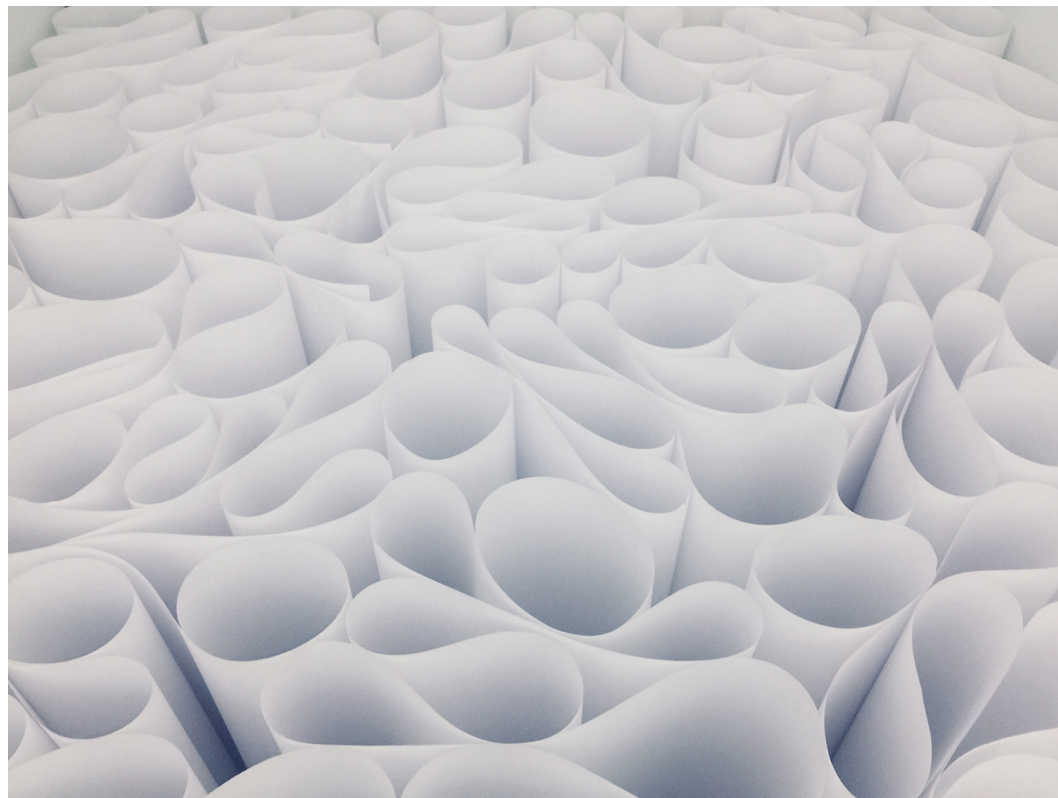


Figure 14-16. Volume 2 Paper Wall.

Volume 2

This project was inspired by a little test sample from my very first project during the first semester in graduate study with arranging old photographic film. I twist and curved this long-exposed waste film and staple it with mini stapler to create this irregular ring pattern. The size of this film pattern was about 8 by 10 inches. The unique part about this pattern is not only the curvy path extruded from lines to three-dimensional with depth, but also the light and shadow through the translucent material reflect the negative image create even the fourth-dimension from time and space. In the most recent, I was trying to expand in both depth and breadth with different materials to create a spectacular effect that can invite people into the space and interact with the space.

Taking a roll of white paper as material, I started curving and stapling different waving units by units to create this seemingly irregular but traceable shape. Then I started to layout every unit to fill in a whole white box-type space size about 3 by 3 meters. In the project I let the paper stand with the action of twisting and turning continuously. I set the paper close at the beginning and separated them apart at the end. I left the space in between and held them together for support.

Paper Land

According to Ingold (2013), "I want to think of making, instead, as a process of *growth*" (p.21). The process of this creation grew into the *Paper Land* in this white empty space. That process of filling in the empty space situated me as a maker and I became a participant of the world of active materials (Ingold, 2013, p.21). From my perspective, a making process is not creating a new world; design is different from invention-creation in the scientific world. As designers and makers, we join the material world and manipulate them with consciousness.

When people walked in to the *Paper Land*, they became participants like me. They touched the materials and listened to the sound of friction between their body and the papers. They squeezed in the space to "force" the paper, and to have it squeeze into others' space. The whole process from the beginning of the making to the end of interrupting from the participants, all comes down to one thing: we are adding our own impetus to promote and dedicate energy in play (Ingold, 2013, p.21).



Figure 17-19. Volume 3 *Bubble Rain*.

Volume 3

What does the world need and what can I do for the world? As designers and makers, we have been asked this question numerous times. The interaction installation *Bubble Rain* is trying to answer this question by capturing the rain moment of nature and bringing it to the tangible material world of realism. This installation invited people walking through the space to experiment with this sense of transformation.

I did this installation work with strips cut from bubble wrap and also had the entire floor cover with a piece of bubble wrap. The strips not only symbolized the rain drops visually, but also creating the sounds of squeezing out of the air from the bubbles. The site is built up in a 3 by 3 meters space that can possibly accommodate ten people walking and moving at the same time. I was trying to hold this rain moment and extend it, giving the opportunity for people to touch, think and feel. I create this space for people who are willing to observe life, love life, nature and the world.

Squeezing the bubble wrap is the essential key action of this work. In Gabi Schilling's prologue for

Bubble Rain

Performative Geometries: Transforming Textile Techniques, she explains that "...empathy is not only achieved by the visual sense, but by touch- thus the interaction of the body with the material" (Agkathidis & Schillig, 2011 p10). Although, hanging the clear bubble wrap fill all space even fully cover the floor, it was still visually transparent. The realization of this space begun from the invitation of participants walking into the space accompanied the sound of plastic bubble breaking. The design itself will never be defined or succeed without involvement of participants whose movements and gestures became the highlight of the design, analyzed and emerged in this space. The contribution of the designer will only be achieved when participants are squeezing the bubble or stepping on the floor - "which lead to a critical self-reflection of the artist; his/her sole role as creator is relativized" (Agkathidis & Schillig, 2011 p10). *Bubble Rain* not only create the physically activity allows people to engage with the materiel by moving their body, but also bring the conversation between people and the material by sounds that are produced by movement.

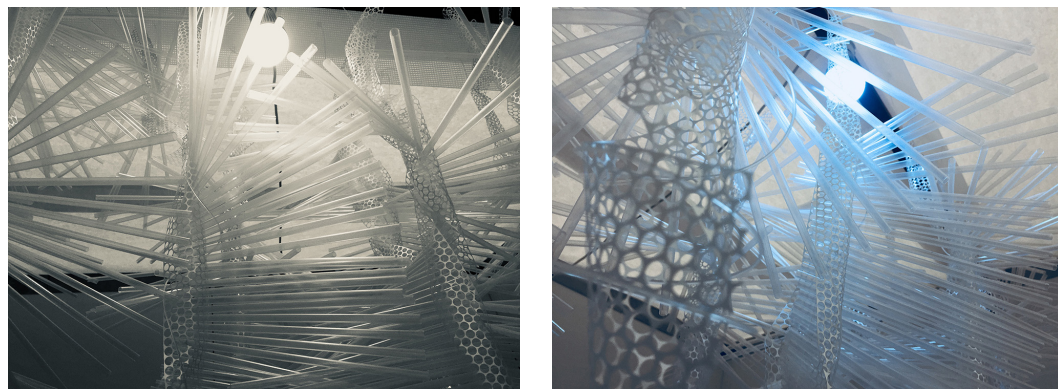


Figure 20-22. Volume 4 *Marine Life*.

Volume 4

In this volume, this installation lighting set occupied volume of 1.5 m x 1 m x 1 m created with straws and plastic trim. I brought in the blue light which reminds me of marine life, and also the permeability of the composition of the straws to create this respiring space that describes the vitality of nature.

When participants walk into the space, *Marine Life*, a cluster of twisted straws moves by brushing their shoulder or caressing over the top of their head. It sounds like, they are hanging whispers in their ears through the movement of the straw. Sometimes, it spins by the flow of air, these rhythms of straws movement block the light and create a dynamic shadow. This communication forms a continuous internal circulation flowing throughout the space that creates this dynamic atmosphere that around the participants.

Light is an integral aspect of my design work. Although working with simple LED light ball at this very first experimentation, the process has given me a

Marine Life

profound and different perception of the past. Light as a material in the design work dose not play the role of illumination which is being able to see in the dark. Light, as Ralph Nauta the co-founder of Studio Drift explains "...it is about conveying emotion and referencing the fact that light is the basis of all life." (Drift Studio, 2017). I consider light as one type of soft material, just like fabric and yarn. It is alive because of the luminosity, just like the fabric because of the interlaced warp and weft, just like the yarns of the twisted fibres. I will discuss the deeper impacts that happened on the subsequent work *Light of Thoughts*, another experience of working with light.



Figure 23-24. Volume 5 *Soft Concrete*.

Volume 5

In this volume of exploration, I created this textile sculpture with grey foam fabric. It constructed with wire inside of each cutting piece through the middle of “sewed tunnel” to provide the fabric with a supporting force. Each foam pieces are 3 meters long and 50 centimetres wide. The size of this work is about two cubic meters. This grey foam fabric symbolizes the architecture from our daily life, however, the differences from conventional concrete building is the twisting and entangled construction that creates this respirable and permeable spaces. The process of this work specifically addresses textile materiality, concentrate on the relation between the involved body, mind, the productive space and daily life surroundings. More than any other material, textile can be manipulated in an alternative structure, such as cutting, folding, sewing or even introducing an additional material to create this visually unconventionality.

By creating this work, I intentionally arouse people’s attention to different thoughts of our everyday habitual thinking through the design works, and appreciation of everyday life. *Soft Concrete* describes familiar things and everyday life like a

Soft Concrete

hard cold concrete building, with a twist that injects the ordinary with new insights, and distinctive expectations where a concrete building could be soft, warm and animated. It can breathe just like human beings. It has bones inside. It is structure just like us. When people have first sight of this work, their first reaction might be thinking it is made of concrete or plaster. After touching and feeling of the actual work, that “Aha!” moment reflects back to the initiate intention and enclosing the dialogue between the artifacts. The arrangement of these components in this work is not prescribed, it encourages people to rescale, reconstruct and reorganize.

The process of “re-doing” not only created a space that interpreted a new understanding of the interrelationship between people and objects, it transformed the original work into the participants own unique understanding beyond that of the designer, the space, and the time. Through the physical transformation to the psychological emotion transmission, *Soft Concrete* allows the originally passive observer to become an active participant and to promote a different perception of this work.



Figure 25-26. Volume 6 *Memory of Future*.

Volume 6

The initial ideas and inspirations of *Memory of Future* combine space-time, the fourth dimensions, Albert Einstein's relativity theory, tesseract and time-travel all together. Those theories and objects bring up my curiosity to think about the mystery of the universe that moves toward four dimensions then provides this huge expanse about time and space.

Various scientific inspiration gives me opportunities that evolved the divergent thinking in design concept. There were many different material experiments emerged in this particular project before the final outcome. The final presentation of *Memory of Future* formed a cube covered with these heteromorphic transparent plastic fabric structures in order to create this illusion space to invite viewers to step into a world of this futurism. I would like to interpret the action as a "time-travel" experience. I create this work to visualize my imagination and make it tangible, as well as to provide a possibility for others to realize their own imagination.

Memory of Future

When participants moved across and into the fabric structure then they see the outside of the box from the inside, and the cut through the texture of this clear plastic fabric creates this fuzzy vision effect indicating an emotional exploration and a psychological state of human beings. The blurry vision also reflects, makes people doubt and even protest the external world which symbolizes the future. As individuals, every participant has their own interpretation of the world, their exclusive memory and the perception of future world. *Memory of Future* provides this opportunity for participants to explore their own imagination based on their own experiences which sublimate this work into an open conversation in a broader sense of human and artifacts. This experimental process not only established with the visual sense, but also introduces the tactile and the olfactory sense. The smell of the plastic fabric is an "accent colour" in this project. The unpleasant lingering odour brings a sense of discomfort and distance increases this rich layer of symbolic futurism and becomes an integral aspect of this whole experience.

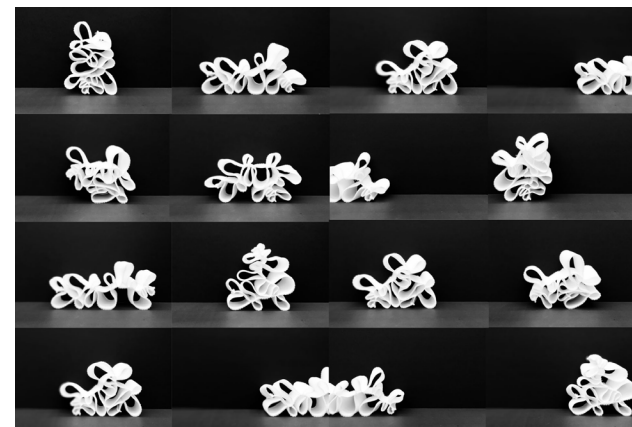


Figure 27-30. Volume 7 *Light of Thoughts* phase 1.

Figure 31. Stop-Motion video recorded the movement of this dynamic form.

Figure 32. Material manipulation experiments with different fabrics.



Figure 33. *Light of Thoughts* visual composite.

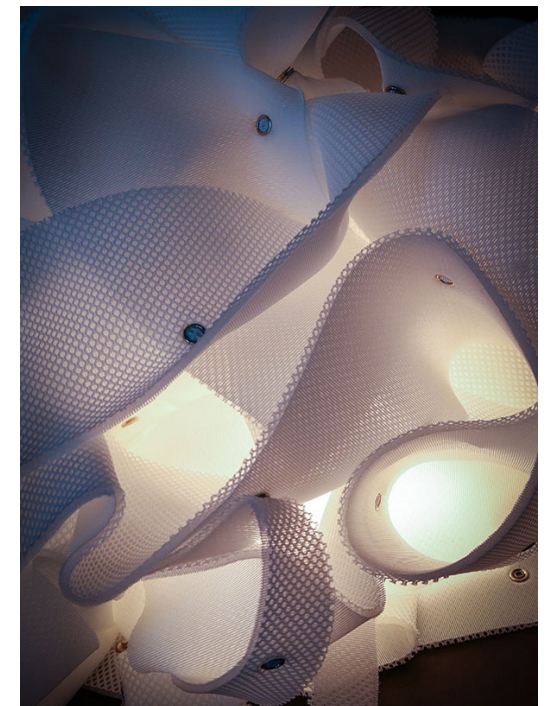
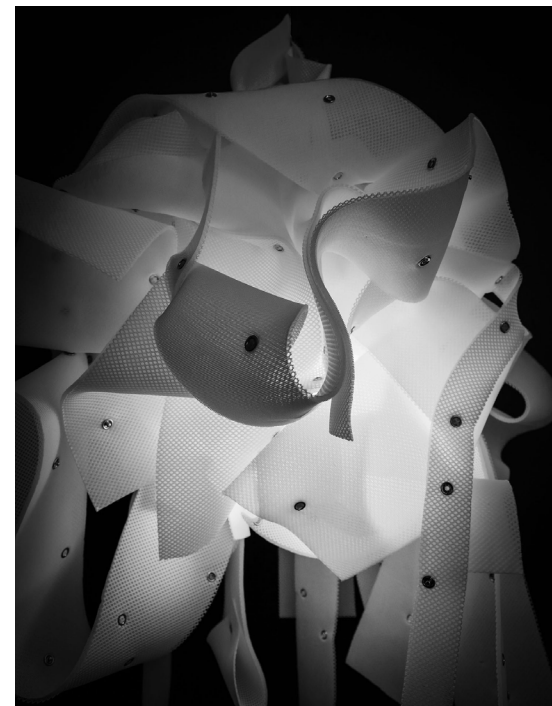


Figure 34-35. *Light of Thoughts* close-up details.



Figure 36. *Light of Thoughts* un-snapping the fasteners in a stop-motion sequence.



Figure 37. *Light of Thoughts* snapping the fasteners in a stop-motion sequence.

Light of Thoughts

Light of Thoughts is an experimental exploration which started in the first semester of the second year, and culminated in the final thesis project, which has experienced and been expressed through a variety of evolving transformations. A critical and reflective methodology, *thinking through making* and *learning from doing*, is the core of this research process and project.

Early material explorations and fabric manipulations captured movement in loosely gathered ribbons. Instead of tracing the regular corrugations of ‘ruff’^[1], I contoured the line within the materials into organic forms, and then extruded the height from the two-dimensional surface into a three-dimensional space (see figure 31). After these manipulations, the three-dimensional form of the honeycomb was both light in weight and possessed some structural qualities. The chosen material is a fabric covered foam with the interior providing sufficient structural support.

[1]The definition from Merriam Webster dictionary online: a large round collar of pleated muslin or linen worn by men and women of the late 16th and early 17th centuries. As known as Elizabethan collar.

The mesh on the outside of the fabric increased the apparent overall lightness and injected an essence of permeability.

The coat-shaped textile form (figure 27) with lights was the first phase of these experiments. As a metaphor for the human body, this light/lighting installation allowed people to move and shift the hanging elements beyond the main body in order to create various effects on a spatial level. The installation suggested the experience of its transformation from bright to dim by manipulating the density and layering of the fabric form.

The second phase of this exploration continued from the principal ideas of the initial phase and focussed on the development and exploration into the dynamic form of the light to actively invite people’s interaction. In this phase, these experiments included and incorporated some known garment construction techniques and fabric manipulation skills, those of gathering, shirring, and boning. I also investigated

diverse accessory materials, such as zippers, tulle fabric, and buttons from which was concluded that the snap-button fastener more closely met the intention of the original intention, a simple action for endless complex configurations. Assembling and reconfiguring the individual pieces in various ways created numerous potential light and shadow qualities, to capture the vitality of a dynamic light. The infinite potential of any lighting configuration in form, scale and density is in the direct poetic reciprocity of the gestures and movements from participants. Moreover, the idea behind the design is to provides imaginative choices for each participant to affect the functionality and purpose of the artifact in challenging any previous preconceptions. The placement of this lighting project could potentially be a range of lighting fixtures: be it a chandelier, a wall sconce, a floor covering, or even a waterfall of lights that either hangs from the ceiling, drapes along the wall and down onto the floor.

The third phase of this exploration was engagement: an investigation of how people interacted with

the material by making, creating and leaving their narratives. In this phase of participatory experimentation, the focus to on explore participant’s interactions and the outcomes from their actions. The collected visual evidence of the participants actions and interactions in their making of *Light of Thoughts* outcomes, opened up discussions based on the topic of materiality. The process of observation, documentation and critical reflection through participants actions and outcomes ascend to diverse comprehensions and perceptions of people and the surrounding materiality within this built environment.

From the Observations...

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The following material explorations from my Graduation Exhibition installation *Light of Thoughts* were presented and discussed as a significant part of the participatory process. A didactic panel was presented next to the fabric strips with snap fasteners and four naked light bulbs hanging from the ceiling. People were invited to use these materials to interact with them and the light source, and to then leave written notes after making if they were willing to. Observations of the preliminary making and the interaction process of the participants were achieved over a period of Graduation Exhibition. It was to observe how people would engage with the materials and would interact with the lighting (see figure 38) based upon their own knowledge.

During the exhibition, when people first came into the space of *Light of Thoughts*, most of them touched the materials. They seemed to be curious about the materials. Next, they took a strip and formed it with their hands (see figure 39). People created a light through their own act of 'making', both individually,

and with their friends. As a group, they were talking to each other. They were communicating and sharing an energy; that of the dynamic interaction between people with their friends and with the lighting that emerged from the interactive actions (see figure 40). The people who created light forms individually were silent when they were making. It was a quiet and mindful process of making without other interruptions. However, the sounds of clipping the snap fasteners could be heard clearly, which as an auditory presence was a communicative interaction and sharing of another sense (see figure 41).

As shown in Figure 42 the degree of familiarity with the design affected participants' actions and re-actions to the design as some of participants were friends and peers. Being designers, they were familiar with the materials and the forms previously created in the research studio explorations of which the impact of earlier designs influenced their own acts making and their formal creations. Their creative actions were an extension of my tacit knowledge and

were illustrated in the resultant configurations of the materials in response to lighting source.

Other interesting observations came about when children came to interact with the lighting. Their own tangible tacit knowledge of snap fasteners motivated and enabled the play with the tactile material. Snap fasteners were easily understood as a familiar affordance to them which to start making with. Engaging with the design revealed an opportunity for children and parents to make things together (see figure 43). Finally, it was noted that the exhibition installation provided young children with moments to just stand and pause. Several times children were observed in front of the form: looking, watching, contemplating and seemingly doing nothing (see figure 44).

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From the Observations...



Figure 38. People interacting with the lighting site/installation to make their own configurations.



Figure 39. Picking up the material from the floor plinth.



Figure 40. People talking and sharing with each other when making.



Figure 41. Individually creating forms



Figure 42. Cohorts and friends are invited to make their light configurations.



Figure 43. A child exploring the materials together with his parents.



Figure 44. A child intently looking at the work..

Reflecting Upon...

Reflecting back to the anticipation in section of *A Conversation* (page 1), through the observation of each the participants who interacted with the thesis research project, new discoveries and understandings about how people engage, adapt and make sense of their surroundings emerged. This insight addresses and aligns with how design can engage people, how people can shape and form their environment, and equally, how we are shaped by it. (Suri, 2005 p166).

Beginning with an installation composed of several naked light bulbs hanging from the ceiling enveloped with fabric strips, *Light of Thoughts* presented a context which offered and suggested to participants to become more active. It invited and provided the opportunity for people to make or un-make and re-make. When people engaged in covering the light bulbs, it seemed to act almost as an extension of their thoughts. Their written responses point to this.

Some people described their feelings as either free and exciting; or fun and playful (see figure 45).

As the observer, the outcomes were collected and analyzed alongside with the written responses during the exhibition participatory installation. Their actions and interactions have informed further future design in the exploration and manipulation of fabric-based materiality by individuals with different levels of expertise and familiarity with making through draping. As a designer, the research always equally takes into account the outcomes of both making or un-making. The observation from acknowledging the way others make allowed me to empathize and gain a new found awareness of the potential diversity of material experiential knowledge.



Figure 45. People's written responses to express their actions and feeling.

Jane Fulton Suri notes in her book *Thoughtless acts?: observations on intuitive design*, that

“interpretation and speculation inevitably take us a step beyond the purely objective to a subjective level, where we draw on empathy. And good design is not just about function; we want it to connect to our feelings and to promote positive emotions” (Suri, 2005 p173).

Light of Thoughts is an invitation for people to participate through their own understanding and thinking in three-dimensional space by wrapping and unwrapping the lighting source, using their tacit knowledge in regards to manipulating material. At times their actions seemed random. A responsive “behaviour that might at first seem arbitrary, surprising, or idiosyncratic usually has an insightful explanation” (Suri, 2005 p167). For instance, participants might not know or have any experience with *draping*, but they were able to easily engage with the materials in order to cover or shade the light bulb(s) by responding to the affordance of the snap fastening system.

In *Light of Thoughts*, the research aimed to create an interactive experience as a combination of materiality, design and performance. Using a mesh covered foam fabric and snap fasteners as the performative and interactive materials, the ambiguous forms embodied the potential to be reconfigured in various and diverse ways in the designs to capture a vitality within a dynamic lighting installation. These prompts within the space invited participants to build and rebuild their domestic environment, with the aim to become

more emotionally engaged with their surroundings. *Light of Thoughts* leaves open infinite possibilities through form, scale and density, while expressing the poetic reciprocity of each gesture, act and movement of its participants.

Through the participatory process inclusive of all the observations and critical reflections, it was learned that the emergent possibilities that lay beyond visual evidence of the participants interacting with the project. The design researcher became enlightened, more aware and sensitive to other people's experience with their designs. *Light of Thoughts* was an exploratory installation that revealed an awareness for both the designer and the participants of the possibilities, potentialities and sensory qualities of various materials, forms and textures (Suri, 2005 p164). The installation provided a site, a context to consider participants' actions and impacts. It was a means to more fully understand how fixtures can be built and configured by people without a draping/fashion background, yet was based on their own expectations and lived experience in the everyday. Deliberately observing and noting how participants acted and interpreted *Light of Thoughts* became an integral source of insight and inspiration for me as a designer. The next section will discuss insightful details from the observed outcomes of the interactions by each participant.

Responses to *Light of Thoughts*

In setting up *Light of Thoughts* created an open-ended invitation within which to interact with the material rather than provide sequential instructions of how to make where to place. The space allowed for people to choose what to make and where to place their outcomes. While most of these forms were left on the hanging light bulbs, some of the configurations were left on the plinth (see figure 46). This deliberate choice of participants to experiment within an undetermined context to engage expressed my conjecture about the future direction of this work through the behaviour of some of the participants. For instance, some unexpected configurations shifted my original assumption about the function of the design. These inspired the pursuance of further possibilities.

During the three week period of the exhibition, the different configurations that emerged offered up some fruitful surprises. The lighting structure was expanded by people who connected the individual light sources using the material provided. The result of this structure was a unified larger form. Simple configurations were also made with single strips, double strips or more. These covered the individual light bulb both partially and fully. Some structures were tied on the top with single strip fabric and hung freely without any connection with other light bulb.

Some were folded multiple times and gathered tightly at the top. Other structures were left hanging from the extension of fabric strip at the bottom of other strips (see figure 47). Complex configurations were made by twisting the fabric, layering multiple strips and connecting various snap fasteners. These acts of making affected the silhouette of the light whilst simultaneously impacting on the overall illumination of the site with the diverse darkening qualities of the multi-layering (see figure 48).

During the first week of the Graduation Exhibition different insights occurred. After having installed a configuration on one light bulb as a demonstration, it was surprising to observe how people added to it. These participants mostly engaged their additions to the existing structure. In the following weeks of the exhibitions, the demonstration artifact was removed. Leaving a fully open the space with just light bulbs and the materials to drape with. The official opportunity for participants to create their own *Light of Thoughts* provoked different types of forms. The demonstration structure was white, and the participants were grey, so as to clearly track the participants' acts of making. In fact, the result was significantly different than envisioned. In the first week, participants were influenced by the white

configuration that already existed. The existing structure seemed to prevent some other possibilities from happening because participants were influenced by and responding to the existing structure, thus bound by the preceding example. In the second week, the fully open space for participants demonstrated that the unpredictable concept of *Open Specificity* would transpire when the designer gave up control of any creative space (see figure 50).

Guests who interacted with the exhibit did so in ways not previously anticipated. From the perspective of a designer, *Light of Thoughts* was a lighting installation, however some of the participants responded solely to *Light of Thoughts* in terms of the textile material possibilities. Foregoing the light element entirely, unexpected creative outcomes were fabricated by expanding their responsive gestures through the making of knots. From a form giving perspective, these knots served an accessory addition to the overall configuration (see figure 51), by extending the form beyond light as diffuser, the knots provided unique potential functions such as a place to hold a pencil. This inspired me. People's intuitive knotting actions serve as a sort of poetic reciprocity from which the participants responses have enabled the research to expand *Animating Material* in new ways.

Responses to *Light of Thoughts*

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Figure 46. Some made configurations sitting on the floor plinth.



Figure 47. Some complex configurations that people made to create different moods of the light and its shadows.

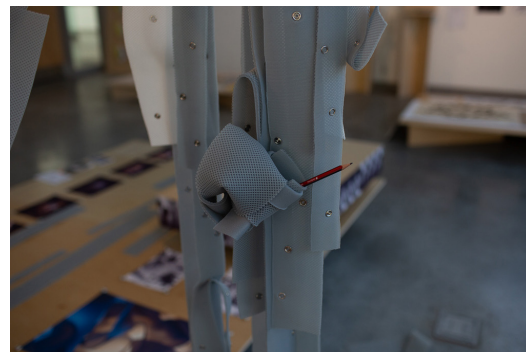


Figure 51. People put a pencil in the knot to interpret their perspective of understanding.



Figure 48. Some less complex configurations.



Figure 49. On the left configurations made by people during the first week of Graduation Exhibition with part of the white fabric structure.



Figure 50. On the right, configurations made by people during the second week of Graduation Exhibition without the white structure as a fully open space.

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Reflecting Upon...

The written responses collected from the exhibition were in the notes that some of the participants left on the plinth. They are derived from peoples' actions and feelings during their interactions with *Light of Thoughts*. The familiarity of the snap fastener was observed as how it enhanced the approachability. Importantly, the softness and flexibility of the cloth provided a space to externalize participants' thoughts elevating the process of research. The written responses recorded the actions and expression from some participants. (see figure 51), were informative to learn how people engaged with light. These outcomes reflected their life experiences as individuals, their own embodied knowledge and their understanding of textiles, more specifically their interpretation of this fabric.

Cloth is malleable and unpredictable. Unlike with other materials such as wood, clay, plasters and so on, many people seemed to be less familiar with fabrics as material for creation. Many of people who engaged with the exhibition installation would touch the materials but would not play or engage with them. This insight elicited a host of possibilities for evolution, diversity and improvement. What if the material was changed and made softer or harder? The softness of the chosen materials allowed people to easily pick it up and interact with it. The material provided enough support enabling a repeatable fidelity of form but was inherently flexible. Changing the structure to a less rigid softer material could become more difficult for construction. It could lose the accessibility and familiarity for some of the participants. However, a harder material such as wood, plaster or metal carries its own affordances, yet over time may create more immersive experiences by occupied more space for people who were in the space.

Future iterations of this research would involve exploration into different types of cloth and fasteners. More material options (different thickness, a range of hardness and soft-touch) would be applicable. The patterns of the textile elements could also be explored more extensively to perhaps include organic shapes inspired by forms from nature. Offering up a larger variety of textiles and shapes may afford a more accessible route and clear affordance



Figure 52. Peoples written response.

to individual people's own tacit knowledge. A broader range choice would reflect on their different interests and diverse experiences, and thereby draw them in to participate. From a phenomenological perspective, participants reflect their experiences through the material interactions in the built environment. Referring to Paul Dourish's description in his book,

“the body can no longer be regarded as an entity to be examined in its own right but has to be placed in the context of a world. Moreover, being-in-the-world cannot itself be understood as a certain relation that obtains between a central body and a surrounding world, but has to be understood in terms of tasks, action to be accomplished, a free space which outlines in advance the possibilities available to the body at any time” (MacAnn 1993 p174)

The observations of people's interactions with the exhibition revealed the different understandings and perceptions of material possibility and aesthetic output between novice participants and those of a trained fashion designer being well acquainted with fabric. The form created for *Light of Thoughts* concentrated on aggregate of natural forms and phenomenon (see section *Nature: An Influence for Designer*). While it could not be anticipated what inspirations people would have when they were interacting with the lighting, it was an important step to share a module of interaction with the participants. The participants responsive gestures with the light by making a pencil holder with the fabric strips, for example, was contrary to the expected aesthetic responses (see section preceding Figure 50). Their own tacit knowledge of textiles and the materials of each one's former experiences influenced participants, and

to create different configurations, to enable different thoughts and interpretations. This challenged the interpretation of its meaning.

Furthermore, because of the exhibition setting or insufficient time afforded to each artifact, the observations revealed the process of people's engagement in some form was incomplete. The formal environmental inhibited a fully interactive play. In general, people do not interact with the designs in a public exhibition. Also, some people just touched the material without further interaction, suggesting that maybe the affordance or the invitation instruction was not motivating enough to arouse their interaction.

As a trained designer who regularly uses draping techniques. I make to know. As I make, I am thinking and re-thinking I am learning from doing and re-doing. Through the period of the exhibition, the installation invited co-creation, reaffirming that participatory research provides many valuable insights and opportunities for designers. Letting go and being open to unknown and unpredictable aesthetic form-giving is a space for a designer/design researcher to discover how to unbind design boundaries between designer and participants in a contemporary context.

In reflecting upon the practice-led research moving forward, an open space for curiosity and ambiguity was quintessential to the research, creatively anticipating the effects of the unexpected.

It is a conversation between myself and the artifacts. It is a conversation between participants and the artifacts.

It is a conversation between myself and the participants.



Being 见自己:

I am collaborating with you.
 I am engaging with you.
 I am caring about you.

Knowing 见天地:

I am working with you.
 I am connecting with you.
 I am in love with you.

Doing 见众生:

I am participating with you work.
 I am interacting with you work.
 I am enjoying your work.

Figure 53. Living with my studio work, a photograph of my former graduate studio space.

CONCLUSION

...Would that I had wings, a carapace, a shell, - that I could breathe out smoke, wield a trunk, - make my body writhe, -divide myself everywhere, - be in everything, - emanate with all the odours, - develop myself like the plants, - low like water, - vibrate like sound- shine like light, - assume all forms - penetrate each atom - descend to the very bottom of matter, - be matter itself!

- Gustave Flaubert, *The Temptation of Saint Anthony*.

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The material studies selected for the thesis which elaborated and explored the concept of animation through the experiments of designed artifacts, especially the lighting, expressed movement in the vitality of space. Most of the material manipulations originated from practice-based making to know explorations into forms as an expression of life: of all matter. This evolved into practice-led research which investigated the interactions, communication, and conversations between humans and artifacts.

The integral influence of nature in the creation of *Weaving Jacket* to *Light of Thoughts* and the *Material Reflective Research* method provided a guiding framework. Each adapted “draping” contributed to a discrete design language. The research exploration embodies the core principles of thinking through making and learning from doing, following the design philosophy of “being, knowing and doing”, referring from a phronesis approach coming from ancient Greek philosophy. Knowing myself as a designer,

knowing the materiality as a maker, and the being and doing with people within this research afforded the nuanced insights of practice described in this thesis.

In summary, the process commenced with a diverse amount of experiments with and within the material practice-led the research. These explorations of materiality were focussed on the act of making as a way of thinking. Then, progressed to the second phase by providing tentative small-scale experiences for each participant. At this point, material and spatial invitations were developed for known people to engage with and to investigate participatory creation opportunities. Later, the scope of the research was expanded to incorporate participation from the public during the Graduation Exhibition who saw and interacted with the design work. The process of this research provided a phenomenological experience that offered opportunities for active engagements for everyone to experience somethings. According to the Merleau-Ponty’s phenomenology of perception, all

perceptions come from one’s experience (Merleau-Ponty, 1962), thus *Light of Thoughts* created a context to expand and broaden people’s perception, thereby their experiences.

Furthermore, the research provided a context for discussions and recommendations to develop shared knowledge and experience in material practice for designers, artists, and makers in the field of animating material. More importantly, the thesis is not an isolated design development but is an experimentation for examining unanswered questions regarding all life including humans and artifacts. Rather than focusing on the decision-making process, the design offers autonomous opportunities to participants, in order to have them engage with artifacts through open specificity (Ramakers, Moors, & Betsky, 2006, p54).

Animating Material: Exploring spatial vitality through performative textile discusses spatial interventions that can be appreciated in a diversity of ways and

interpreted through new understandings from inert to dynamic. The design is constructed of a series of an interactive experiments in which participants explored reactive installations and engaged in dynamic form building activities. It is an informal, tacit study of the interrelationship between people and artifacts. The project, as a whole seeks to enhance awareness and appreciation of life, both their life and their artifacts.

As a designer and a maker, the path of this exploratory research provides recommendations in understanding the evolution and relationship in and between practice-based research and practice-led research. This research is not solely to create artifacts but is to offer insightful experiences and knowledge that could be adopted by other designers, artists, and makers in the interdisciplinary space between humans and the materials they engage within the built environment.

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NEXT...

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Throughout the history of art and design movements inspiration drawn from nature is a recurring thematic investigation. It is a way of celebrating nature, life and phenomena as being affirmed by designers and artists. Most of the design works in this research are inspired by specific elements and qualities within the natural world which have evolved to incorporate people-oriented design concepts. Set in a contemporary design context, *Animating Material* is a tacit study of the expressive and performative nature of materials in fabric, paper, bubble wrap, plastic trim, and plastic straws, and plastic table cloth. It illustrated and highlights the act of making in our everyday activities. It enables a meaningful form of expression through different materials.

Within this practice-led research, the term *performative* means activated, responsive, and animated. These qualities also reside within textiles: a textile cannot be *performative* without action, without response, without manipulation and without an interaction with people. In the research process, introducing textiles to others through installations allowed for an experimentation as to how

fabrics might be performative beyond an everyday functionality, increasingly drawn to consider how that interaction with fabric can influence a person's experiential reflection and their understanding of that experience through the residual acts and action of making.

Participatory interactive making either with others or individually is key to a design framework that gives people an opportunity to re-discover the context of things around them with respect to nature inspired forms. By giving a site for making through simple and/or complex actions and to reflect upon them is an opportunity within this research to rethink how to interact in the built environment. The designs in *Animating Material* offered interactive experiences and engagements. It has provided a way to explore and re-recognize the material world by designing spatially variable ways of thinking as noted in the section *Exploring vitality through materiality*.

More importantly, practice-led research kept pushing the research forward into uncharted territory. 3D modelling and 3D printing technology were brand new experiments for me as a maker and designer

(see samples in *Appendence: 3D Printing Experimentation* section). Not only new techniques and materials but new ways of thinking all provided me with an alternative creative space to start new conversations about the possibility of making and the potential of materials. Concurrent with new techniques, it remains vital to hold onto the preciousness of the skills and tacit knowledge of our tacit hand, as every single trace is unique and dynamic.

Looking forward to future experiments and explorations, it is intended to develop a new collection of textile lighting installations based upon *Light of Thoughts* as ongoing practice-led research. This project will continue with these new ideas and new knowledge to expand and experiment in an active dialogue between the body and space through the vitality of performative textiles.

Within a contemporary design context, *Animating Material* engages in interdisciplinary research across fashion design and industrial design. This research is driven principally by an interest to reflect upon the phenomenological experience for people. Originating

and derived from studio material explorations, the research has evolved into creating a unique interactive experience for people that inspires an awareness of material culture to provoke further thinking in how to engage and be involved more directly in the material world of our everyday lives.

Finally, throughout the design experiments and outcomes, the intention was not only to find a way to balance, connect and communicate between this rich, vivid, and vibrant relationship of people and the material culture, the research also offers an alternative way of thinking through materiality, to seek opportunities for interactions, to engage differently from ordinary familiar everyday acts, and to design a bridge between humanness and materiality.

I believe in the relationship between humans and artifacts as harmonious symbiosis.

I believe that people care that all matter has life and all life matters.

Artifacts act.

Humans respond.

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<https://www.theverge.com/2013/8/16/4624738/radiant-soil-philip-beesley-architecture-installation-edf-fondation-paris>

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I. Precedents

1. Kinetic Architectures & Geotextile Installations by Philip Beesley

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Figure 54-56. The living architecture of Philip Beesley "Radiant Soil" installation immerses viewers in a state of "delicious vertigo" By Amar Toor on August 16
<https://www.theverge.com/2013/8/16/4624738/radiant-soil-philip-beesley-architecture-installation-edf-fondation-paris>

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According to Beesley's discussion in his work:

A key term for my pursuit is empathy. My use of this term draws upon aesthetic theory that examines nuanced relationships involving projection and exchange. Combining terms of mechanism and empathy, I hope to develop a stance in an intertwined world that moves beyond closed systems. By drawing upon recent revisionist readings of cultural history, I want to develop a sensitive vocabulary of relationships. In the terms of figure-ground relationships the figures I compose are riddled with the ground. (2010a, p.20)

Philip Beesley is a Canadian artist and architect. His research and exploration focus on responsive architecture which takes the form of an immersive and interactive environment that moves around its participants. His dynamic architectural installation creates an environment that can actually 'feel' and 'care.' Beesley's project created a 'Hylozoic Soil (2007)' environment which is a function of a living system that "allowed human interaction to trigger breathing, caressing and swallowing motions and hybrid metabolic exchanges" (Beesley, 2010b, p.13). The project's title 'hylozoism' describes the ancient belief that "matter is animate and possibly even conscious; and that life is inseparable from matter" (Beesley, 2010a, p.30).

2. Studio Drift

Precedents

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Studio Drift was established in 2007 by Lonneke Gordijn (1980) and Ralph Nauta (1978), who both graduated from the Design Academy Eindhoven (NL) in 2005. In their installations and interactive sculptures, the relationship between nature/human/technology is key. Gordijn's fascination for nature and that of Nauta for science fiction and technology intersect in an intriguing way. Over more than a decade of their existence, Studio Drift's work in product and furniture design has evolved into increasingly larger, often site-specific and moving installations which they have realized all over the world. The works occupy a wholly unique place between disciplines such as tech art, performance, and biodesign. Data and algorithms derived from natural phenomena often form the basis for Studio Drift's work – the flight patterns of a flock of birds, for instance. With the help of state-of-the-art technologies they translate this data into poetic, meditative experiences. Their ideas regularly anticipate technological possibilities ("Studio Drift," n.d.).

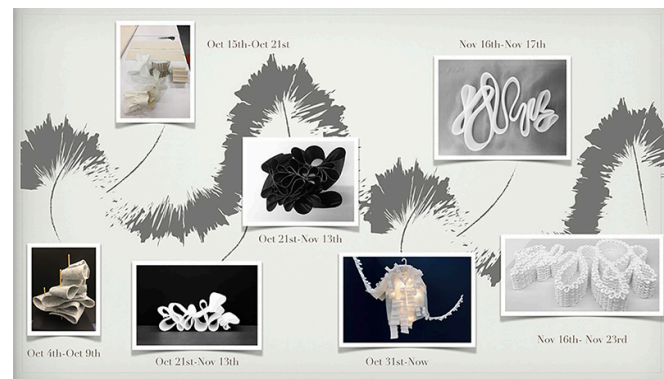


Figure 61. Material experiments timeline.



Figure 62. Material experiments with felting wool.

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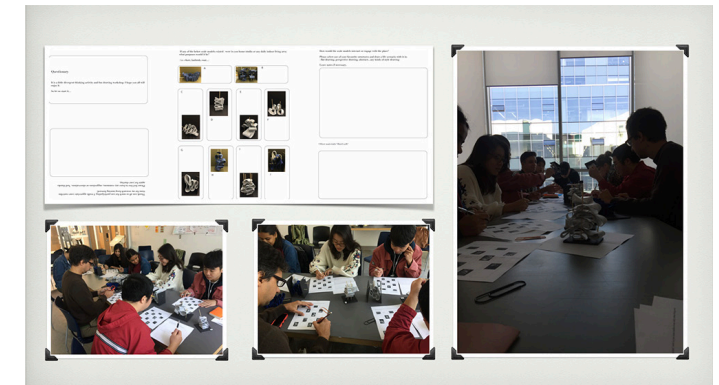


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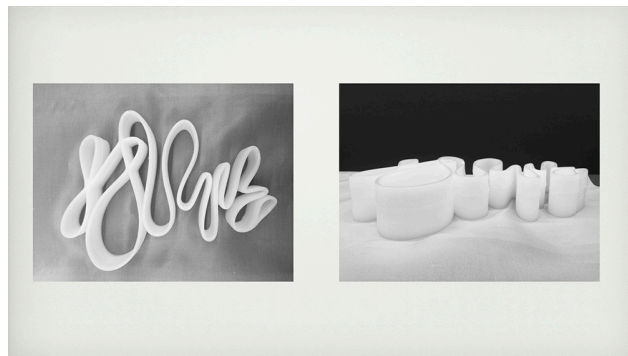


Figure 64. 3D print in silicone.



Figure 65. 3D print in silicone under the light.

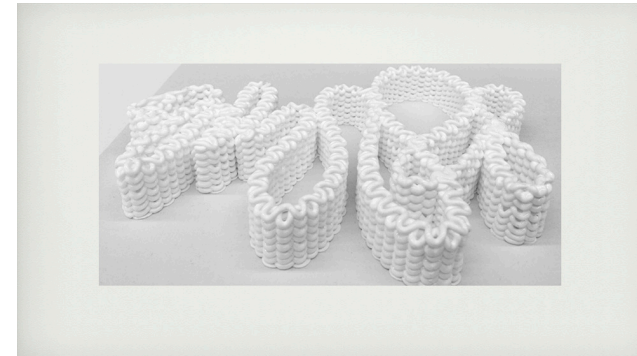


Figure 66. 3D print in silicone with texture paths.

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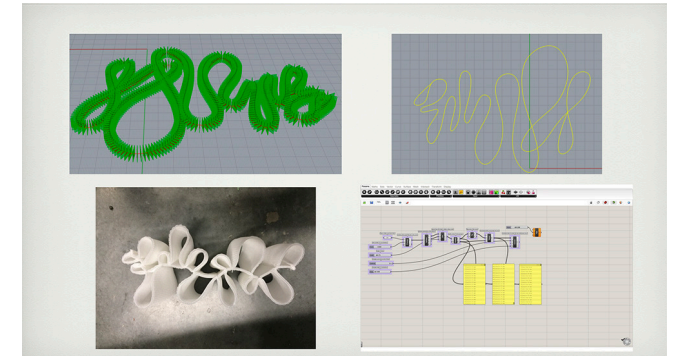


Figure 67. Screen shoot of Grasshopper for 3D printing.

