ORIGAMI IN FASHION

Chia-Lin Wu, B.A.A.S.

Problem in Lieu of Thesis Prepared for the Degree of

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APPROVED:

Marian O'Rourke-Kaplan, Major Professor Amie J. Adelman, Committee Member Bruce Nacke, Committee Member Janie Stidham, Committee Member D. Jack Davis, Dean of the School of Visual Arts

C. Neal Tate, Dean of the Robert B.

Toulouse School of Graduate Studies

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The focus of my work is the incorporation of three-dimensional sculptural forms into the design of my garments while still maintaining the functional purpose of the garment.

Origami paper folding is the inspiration for the sculptural forms. The major endeavor was to explore and solve the relationship between the organic human forms and the geometric forms created by the origami paper folds. This presented a challenge of exact precision. During this process, I experimented with different fabrics, which can accommodate the sharp creases and retain the shape. A variety of folding patterns were also explored. Although the design should be innovative and creative, the final garment must be wearable and comfortable.

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CHAPTER 1

INTRODUCTION

My research focus is the integration of three-dimensional sculptural form into fashion.

Origami paper folding is the main inspiration for this design concept. Folded sculptural forms react to movement and (the play of light on the fabric that the creases create) the creases of the fabric catch every play of light.

The Japanese word *origami* is a compound of *ori* (to fold) and *kami* (paper). Although origami has been a part of Japanese culture for more than a thousand years, it began in China, the birthplace of paper. Papermaking was developed in China two thousands years ago but the Chinese did not readily share this knowledge. It eventually traveled to Korea and then Japan by the seventh century where the practice of origami was expanded to an art form.

Two highly artistic fashion designers, Issey Miyake and Charles James, influenced the origami in fashion concept. Issey Miyake is known for his unconventional designs and reinterpretations of traditional textile designs in various modern materials. Miyake transcends both his Japanese heritage and his training in Western couture to redefine the concept of clothing and reinvent the activity of wearing clothes. His pleated creations are especially inspiring because they show how modern clothes can be high-tech as well as fun. His innovative fabrics for pleated garments are created by uniting the advanced technology of permanently pleated polyester with the traditional form of paper lanterns.

Charles James filled his designs with beauty and technical brilliance. James was a perfectionist who obsessed with the cut and construction of each garment, producing designs that were unique. He was an architect of fabric and talented at manipulating diverse body shapes and forms. His designs were as beautiful on the inside as they appeared on the outside.

These two designers' avant-garde styles are striking and timeless. Inspired by their designs, I intend to create elegant garments with sculptural elements through origami techniques. Folding in fabric is a totally different experience than folding in paper. The weight of the fabric, its crispness and memory are all critical considerations. Fabric requires hot iron pressing and sewing techniques to create and retain the folds, while paper requires no supportive material or special techniques simply hand folding.

The strictest rule of this project allows only the folding of square fabric followed by the folding instruction. This rule serves both to stimulate creativity and to impose on origami models a general style of great economy and power. Within the rule and within the general style there is, however, a surprising amount of room for individual differences and each creative fold/design blends vision with method in a unique personal way.

Discussion of Previous Work

The gold evening dress, *Canary Creeper* (fig.1), combines a reform of origami art with a transformation of Gustav Klimt's painting. The gold chiffon balloon skirt is appliqued with a spiral cascade panel made of gold tulle. The skirt is covered by ivory organdy that is folded

by origami "Sweet Flag" technique. The corset top is also made of the same fabric with a spiral cascade panel.

This dress is an interpretation of origami art. The paper folding concept, including pleating, folding, and gathering, creates the object with three-dimensional illusions. This work is significant because it was my first attempt to make the transion from paper to fabric in origami art. This method of work it became clear to me how to manipulate origami art on the human body. The painter Gustav Klimt inspired this work because of both the color choice and the appliqué design. His painting, "The Kiss" embraced with golden glittering pigment, geometric and organic ornaments was a major inspiration for *Canary Creeper*. He is well known for placing the female figure into a fantastic environment. The figure he paints is absolutely feminine, with luxuriously decorated dress and background; I picked up his feminine point of view as a guide to designing my own creation.

The structural organization of my work is a complicated one, when compared to my other work. From my research study, I followed the instruction from the origami book and made a vest number of folded sample. First, I played with all my origami samples and drew many sketches to illustrate my ideas of using the paper folding and Klimt's painting on the female form. Then I searched for the fabrics that would suit my design. Once the ideal fabric was found, I made a muslin sample of my design. The sample is made from a fabric of similar drape to the final fabric used for the garment. Making a sample is an essential step. This

allows design and fits adjustments, so the final fabric will not be wasted. In addition, the sample helps me to have an organized sewing sequence. After the sample is revised, work can begin on the final garment.

Despite the time consuming procedure and constructional difficulties, I still consider this piece to have been very successful in expressing my concept. This experience provided me with a more effective concept in which to plan my MFA collection.

Statement of Problem

The focus of my work will be the incorporation of three-dimensional sculptural forms into the design of my garments while still maintaining the functional purpose of the garment. Origami paper folding is the inspiration for the sculptural forms. The major endeavor will be exploring and solving the relationship between the organic human forms and the geometric forms created by the origami paper folds. This presents a challenge of exact precision. During this process, I will experiment with different fabrics, which can accommodate the sharp creases and retain the shape. A variety of folding patterns will also be explored. Although the design should be innovative and creative, the final garment must be wearable and comfortable. The following questions will be addressed:

- 1. What fabrics are most effective in retaining the origami shape?
- 2. How can the two colors of double-sided fabrics be used effectively?
- 3. What origami forms work best with the organic form of the body?

Methodology

Origami is a geometrical art form and for this reason there is little tolerance for error in the folding process. Small inaccuracies at the beginning turn into large ones as the sequence progresses. Folding on a hard, flat surface is the best way to get sharp creases and precise results. Where the instructions indicate that edges or points are to be brought together, align the points or edges carefully and crease the fabric. Where two points are to be connected by a crease, fold the fabric over to make small pinch marks through the points, and then crease through the pinch marks. Soft creases also have their place in origami that can be used on fabric; subtle shaping, rounding, and adjustment of the finished form can enhance the appeal of many models. Many different types of fabric can be used for origami. The choice depends on the type and size of the model to be folded, the finished appearance desired, and the available type of fabric. Basically, any fabric that can hold creases is suitable such as organza, double-faced satin, taffeta, and dupioni silk.

I propose to create nine garments using various textile and origami paper folding techniques. Some garments are designed to use double-faced fabric and the design emphasis of two colors will be used accordingly. Keeping a journal, and discussing my findings in a written paper will document my work. An exhibition of the garments produced for this problem in lieu of thesis will be implemented.

CHAPTER 2

DESCRIPTION AND ANALYSIS

As described in the Chapter I, my previous design had a strong sense of ornamentation. This ornamentation was very meticulous and contained too much detail and decoration. I considered would be a problem for and would overshadow the origami design. Therefore, my interest in detailed surface decoration changed at this point and I began concentrating more on a more serene line and shape of the silhouette.

My idea on how to support the origami design was to emphasize simple, succinct shapes that embody simplicity as a high ideal in womanly beauty. The designs for this collection should have clean lines with structural details: feminine but strong, lots of opposites, and strength in diversity. Also, everything must have balance so that the delicate and the strong can work together. My ideal of clothing as an art form is in cleanness of line and balance. Minimalism shows purity of details. My details contain structure, texture, and fabrication, tailoring and finishing. My sensibility is organic through feminine, modern, and fluid but cut for comfort.

Since the simplicity and purity are my focus, choosing appropriate material becomes an important issue to create an ideal garment. The art is in seeing fabric as a graphic element, translating practical details into interesting forms, and then taking away anything that is not useful. I love fine fabrics and always have an unhesitating idea of how they should be used. A

design begins when I first see an interesting piece of fabric. The touch, feel and texture play a part in how I envision the fabric to respond to my idea. Then I look at how it drapes and flows, and how it sets the silhouette. The argument between the pattern or texture and the tone and hue of colors inspires the design's direction. To me, fabric expresses its true character when I use it in a subtle way.

Question 1

The search for the right fabric led me to explore various silks, cottons, wools, polyesters and rayons and I stayed with the lighter weights of each fabric. The heavier weights might have held a fold, but would have dragged the garment down. I needed a fabric that would be easy to fold, sew, hem and could be pressed with a hot iron.

<u>Test Samples</u>: The test samples were 15" x 15" and I put them through, folding with a hot iron, hemming treatments (flaming the edge, glue, hand-stitching and machine rolled).

<u>Ironing</u>: I tried using a hot iron with steam, but the moisture of the steam defeated the purpose of the hot iron. The dry hot iron worked best, but with delicate fabrics a pressing cloth was used so as not to burn/melt the fabric.

<u>Flaming</u> the edge: This technique worked with some fabrics, but not others. Those it did not work with the edges burned to quickly. The process was too hard to control the flame and did not produce a professional look. <u>Gluing</u>: the edges became hard and thick and with some fabrics the glue changed the color of the fabric. Hand-stitching: this was the best

method for hemming and was done on all the organza. <u>Machine-rolled</u>: This process worked best on the slightly heavier fabrics, but a finer needle was used to prevent the needle holes from showing and giving it an unprofessional look.

The silk samples: *Dupioni silk* – was lightweight, had a texture like paper, took the heat of the hot iron, and held the folds extremely well. *Silk organza* – this sample had metallic threads running through it so a hot iron was not feasible for the folds, but this fabric has good memory. So I folded it by hand. I used a hand-stitched narrow hem for finishing because the organza frays.

The cotton samples: Of the cottons, I used *broadcloth*, *cotton organza*, and *cotton organdy*. These fabrics could be ironed with a hot iron to make the folds and fairly well. The organdy and organza frayed to some extent but was too fragile to flame the edge so they had to be hemmed by hand. Fabric glue held well, but it changed the color of the fabric so I chose not to use it in the final garments.

The wool samples: very lightweight wools similar to that used to make men's suit. The wools were similar to the cottons, but the folds were not as successful. The sizing and starch in the cotton may have helped with the folds. Wool being a softer fiber is why they were not as successful. Flaming the edges of the wool did work well as did the machine rolled hem. Hand-stitching did not work as well unless the stitches are very close together.

The synthetic fabrics: Flaming would not work on these fabrics and they are very flammable. I used a *satin* and *polyester organza* and a *double-sided (two-color) polyester "crepe-backed" satin*. Hand-stitching hems was not successful on the Satin, work well on the organza, but was most successful in the crepe-back satin. The iron could not be set at the hot temperature it needed to be to hold the folds, because it would melt the fabric. The softness of the synthetics, when folded on the bias, did not create a squared line. It seemed to wander and not be true.

In the end, I chose the silk, for most of the final garments because these fabrics scored higher on the testing than did the other fabrics. Also, the luster and shine of the silk would give a more of the look of the flowers they were styled from.

Question 2

Two color doubled-sided fabric can be a design challenge in itself. The main challenge of this fabric is deciding which color to use for the main emphasis and which for accent. If not used correctly the resulting garment can be a disaster and very unappealing.

In my garments from this type of fabric I mainly chose the designs that are soft, modern, elegant, and complemented by touches of unusual detailing. In addition, I chose to use the darker side for the main emphasis of the garment. In the evening dress *Poppy* (figs. 2 and 3), the play of the light red on the dark is very dramatic. This is also true of the pant-suit *Luanta* (figs. 4 and 5) with the gold reflecting off the tan crepe.

The patterned skirt and solid top of *Acacia* (fig.6) works, but I feel now that the lighter color with the dark accents would have proved to be more dynamic. I was trying to pick up the light accents in the skirt with the dark of the top. This gives me a different way of looking at this dilemma and I will make a small sample of both colors as the main emphasis to see which might work better.

Ouestion 3

My design inspirations came from Charles James for his shapes and forms which are sculptural in concept. Issey Miyake brought inspiration in his use of fabric manipulation. Miyake's designs I found too masculine for my concepts. I envisioned my garments to be functional, feminine, and chic; a refined yet elegant look that has structural and textural interest, and that were colorful and artistic.

Nature was a large part of the theme behind my origami pieces. The use of the folding techniques for flora and fauna held the best choices the abstract designs for my collection. The use of silks proved to be the best choice of fabrics that would hold their shape without too much additional attention than a hot iron. A few folds needed a little extra help and were hand-stitched in place. Floral shapes provide a feminine look they have structure, texture, and yet are soft and colorful.

The search for the right shapes was intensive. I read a large variety of books on Origami.

My list of resource material is found in the Appendix. It was a challenge to follow the

different folding techniques to find what would work with my concept. I stopped before completing the entire design, because the finished origami design was not exactly what I was after. I used about 5-12 folds per origami segment for each of the garments in my collection. There is only one origami emphasis per garment and they were used on neckline, sleeve, collar, pocket or inserts (in pants). The shapes chosen for my collection were Sweet Flat, Orchid, and Lily in the plant family and from the fauna, Swan, Giraffe, Butterfly, Crane, Owl, and Tropical Fish. These designs gave me the looks that I was after for the origami aspect of my collection.

The steps. I used improvisation and a modification of an existing design to achieve the look I wanted for each of my garments.

Luanta

Luanta is a two-piece tan and gold pants outfit. The top is halter-like yet the front is split open below the collar (vest-like). The Capri pants have an origami insert on the outside of the leg. The insert for Luanta is a 12" square fabric folded with the "Sweet Flag" technique. The folding piece looks like a long pointed cup. The fabric is a double-sided polyester crepe-backed satin. The crepe side was used for the main garment with the gold satin for accent on the origami insert and the upper collar.

The ordinary flora origami techniques lead the final shape for four petals. This sweet flag folding technique is an unusual one and the finished shape is a single petal used for assembly purpose. This technique suits my vision to create a simple and sophisticated design.

Combining this fabric and folding technique needs more attention for maintaining the final appearance. The polyester satin cannot handle the high temperature iron which causes an unwanted shine on creases; however, the low heat iron cannot hold the creases very well due to the softness of this kind of synthetic fabric. The soft character of this satin has poor memory for holding sharp creases, especially the creases folded on the bias. The bias creases are stretched and lose the precise shape.

The methods I used to solve these problems on this garment were also applied to the rest of the garments: have a same size square paper set next to the folding piece of fabric. Both paper and fabric are doing the same folding procedure so I can compare them and check if the fabric is on the precise shape. Set the iron to medium heat, when ironing the fabric, put a piece of muslin between the iron and the satin in order to protect the fabric to avoid the shine. Use pin or basting stitch to hold the creases temporarily. This prevented the stretch to the bias creases. I used hand stitching to sew the folded piece on pants.

Acacia

The top is made in a double-sided satin with a painted silk skirt. The folding technique used is "Owl" on a 22" square, which becomes an interesting composition of an owl flying

around the romantic atmosphere of *Acacia*. Garment is based on haute couture silhouette with Japanese imagery inspired by the Japanese Kimonos of Hanae Mori. The following passage best describes the effect I was after.

The kimono creates a special beauty when the wearer is sitting quietly in formal Japanese style, with the legs folded beneath the body; when she moves, it is done so as to shift the center of gravity, to change the position, as gently and inconspicuously as possible. Essentially, moreover, the kimono aims to avoid decoration on the upper half of the body and to create a clean, simple form. Thus the effect is all the more brilliant and striking when the wearer finally stands up, revealing the pattern extending around the bottom of the skirt (Mori, 2001).

For the upper body of the dress, I chose the front folding piece the same color (dark green) as the bodice to unify the simplicity of color choice and the revealing light green as a highlights. The large size of this folded piece along with a complicated folding technique made it more challenging to finish. I used a basting stitch and pins to hold the folded creases on almost every segment.

When put together the tail forms the front point of the top and the wings are connected at the back with snaps. The snaps can make this folded piece separate from the dress and provides two good advantages. One is good for storing and ironing of the folded piece. The other is to hide the unpleasant look of the zipper on the center front. Although *Acacia* is a very difficult design to construct, the result is indeed a great pleasure to view.

Poppy

Gladiolus

Sugar Maple

This skirt and jacket was done in a double-sided satin using the origami folding technique of "Tropical Fish," in the pocket flaps made by 10" square fabric. The long skirt creates the opening of the poppy flower giving a romantic feel to this garment. It opens space for the blossoming, creating room around the wearer, and filling the room with unique aura. The pocket flaps are a whimsical touch to this otherwise very feminine formal ensemble.

Gladiolus (figs.7and 8) is made from Dupioni silk and uses the "Swan" origami technique on a 15" square for each sleeve. The sleeves of this dress are detachable making them easy to store and maintain their shape. A Gustav Klimt painting inspired this garment, "Judith I," an ancient heroine with the sexy appearance and glitter gold paint surrounding her. This painting directed me to a fantastic imagination. The sleeve design of Gladiolus was my focus that brought out not only the abstraction of flower shape but also an elegant armor transformation from Judith I. Revealing skin was also a main concern when designing this garment as it is in haute couture: how much to show, how little, and where to let it show.

Sugar Maple (figs. 9 and 10) is made from Dupioni silk and silk organza with a 20" square in the "Giraffe" origami technique. The giraffe folding technique proved to be a wonderful resolution for a short sleeve pattern without many alterations. The color of fabric

and the triangular of the pleats visually transform the sleeves into the layers of maple leaves. Silk organza woven with metallic thread is the easiest fabric to fold, compared to polyester satin and dupioni silk. In sleeve constructive comparisons of *Gladiolus* (made of Dupioni silk, detachable from bodice) and *Sugar Maple* (made of silk organza, sewn in cap form), *Gladiolus* needs a lot of machine stitches for the rolled hem and to set creases in position, whereas *Sugar Maple* only required a few hand stitches to hold the creases and roll the hem.

The neckline adornment of silk organza was done with an 18" square in the "Crane" origami technique (figs. 11 and 12). The rest of the garment was of Dupioni silk and represents an elegant Tuxedo look. There is more color contrast of this Dupioni silk and organza combination than the others. Its bareback design adds a feminine element to it and changes the conservative look of the original Tuxedo.

Mimosa

Mimosa (fig.13) is made from Dupioni silk and silk organza using a 10" square in the "Crab Orchid" origami technique. The origami folds are sewn along the V-shape neckline to depict the character of mimosa, with its gradually closed leaves. The standout pockets give it structural drama. Besides the folding collar, the bodice construction was a difficult one to complete because the dress itself contains bias edge pieces in the yoke. Bias edges stretched

and to match them precisely into the right position with the sharp edge yoke took considerable time and patience in finishing.

Camellia

Camellia (figs. 14 and 15), this cocktail dress has side pockets in silk organza each made with a 25" square folded in the "Butterfly" technique. The body of the garment is made of Dupioni silk. Its design is highlighted not only by the functional big pockets but also with a decorative ruffle. The A-line mini skirt, sewn with a fused Dupioni silk binding, presents a lovely round edge.

Magnolia

Magnolia (fig. 16) is an evening coat worn as a dress. It was made from Dupioni silk and silk organza. The silk organza lapel was made using the "Lily" folding technique on a 16" square of fabric. This "Lily" petal lapel was the simplest of folds in my nine-garment group, but the simple folds supported the sophisticated look of the whole garment.

CHAPTER 3

CONCLUSION

Creating a folding method for a design illusion that simplifies the subject can be effective and efficient. Simple models have the virtue of clean, uncluttered lines. Many of the models I experienced were highly detailed and delicate. Manipulating realism for elegance can free the design to be more interpretive and expressive.

Discovering folding possibilities and designing new models are not dependent on completing every origami model. As I progressed through a vast number of folding techniques, I finally felt free to use them in my own creations. Sometimes I had trouble achieving a particular result, but did not give up. I tried to be patient and checked to see if perhaps another design could be incorporated into the folds. Sometimes a model could be designed in a minute, like the "Butterfly" fold on *Camellia*, and sometimes it took a while, like the transformation of "Owl" on *Acacia*. Sometimes the models were full of depression and frustrations, but sometimes they would give me huge surprises and feelings of achievement. This is the type of progress that brought my final designs and unique styles to the fascinating art of origami and fashion.

Different colors, folds, and designs represent different expressions of characters: *Iris* and *Mimosa* are simple and sophisticated; *Camellia*, *Sugar Maple* and *Luanta* are cheerful and chic; *Poppy* and *Magnolia* are elegant; *Gladiolus* is a glimmer of sexual allure with it's

detachable sleeves.

Fabric choice was very critical to the success of the concept of combining origami and fashion. Fabric's lack of permanently shapeable character can never compete with paper for easily handled construction. Through my entire fabric research, Dupioni silk and silk organza were the two most effective materials. Both are lightweight and stiff so they hold the creases very well. Silk has a natural sheen and plays light well. The iridescent shine of the Dupioni silk is achieved by the use of two different colors of threads. In *Mimosa* the vertical threads are a cream color while the cross-wise threads are a light green. This gives a shimmer when the light hits the fabric at certain angles and the color appears to change. The silk organza uses only one color thread and the shimmer is achieved by the use of a metallic thread woven in with the cross-wise thread.

I found that the polyester crepe-backed satin does not maintain the creases well due to the satin's softness. If I could find this type of double-sided fabric made of silk, it would produce a better result for the three two-tone color designs, and it would present fewer construction difficulties.

I was satisfied with the fabric combination chosen for *Acacia*, it was combined with double-sided satin and silk painting. However, it did not stand out well in the gallery. It looked good by itself, but did not fit in with the other eight designs. I should make it using only double-sided fabric to harmonize the whole group.

I had a lot of changes in design concepts from my previous work, *Canary Creeper* to the final nine designs. Previously I added too many elements to a single design and lost the main focus. I have now learned to appreciate that the best designs are the simple designs: simple, but not necessarily plain. Simplicity of design still can contain elements of creativity, innovation, and sophistication.

FIGURES

Figure 1 Canary Creeper



Figure 2 Poppy (front view)



Figure 3 Poppy (detail)



Figure 4 Luanta (front view)



Figure 5 Luanta (detail)



Figure 6 Acacia

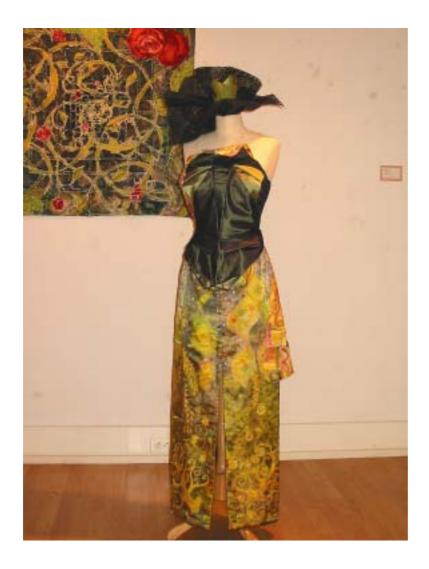


Figure 7 Gladiolus (side view)



Figure 8 Gladiolus (front view)



Figure 9 Sugar Maple (front view)



Figure 10 Sugar Maple (side view)



Figure 11 Iris (front view)



Figure 12 Iris (back view)



Figure 13 Mimosa



Figure 14 Camellia (front view)



Figure 15 Camellia (detail - back view)

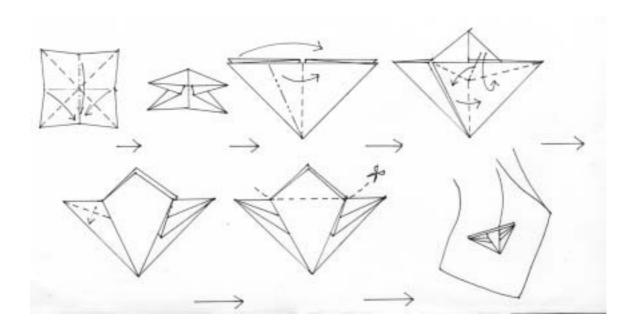


Figure 16 Magnolia

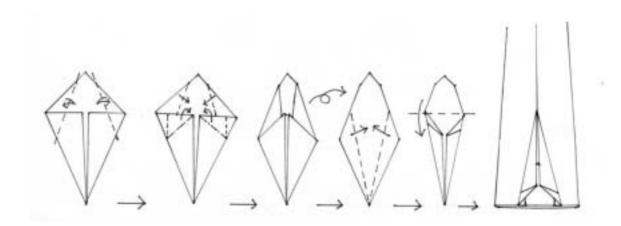


APPENDIX

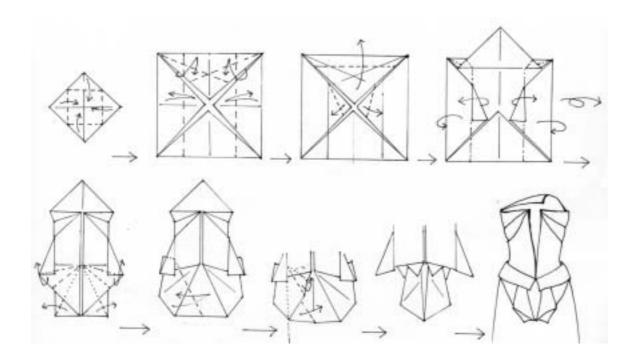
Tropical Fish (Poppy)



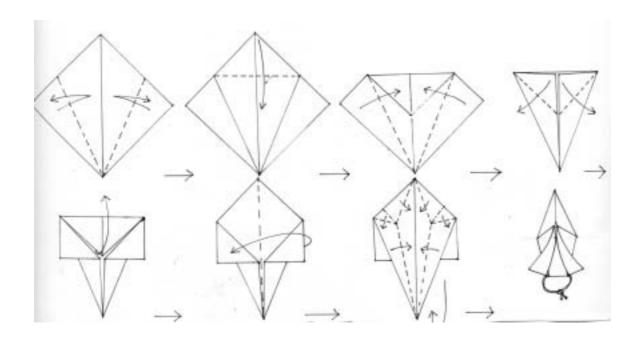
Sweet Flag (Luanta)



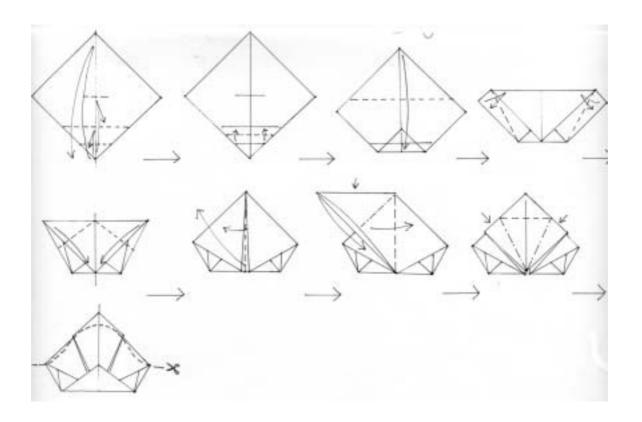
Owl (Acacia)



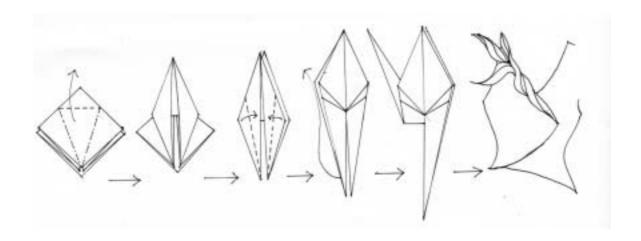
Swan (Gladiolus)



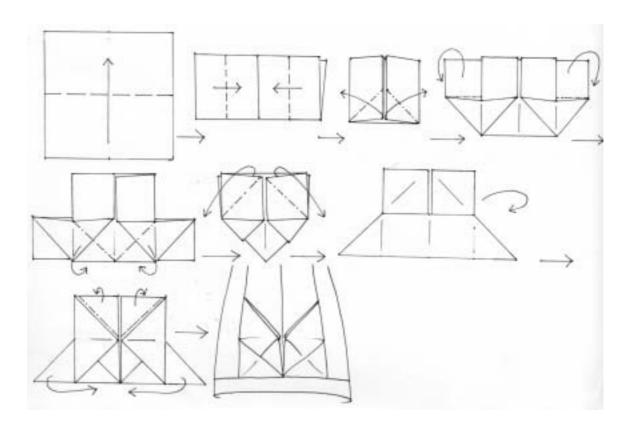
Giraffe (Sugar Maple)



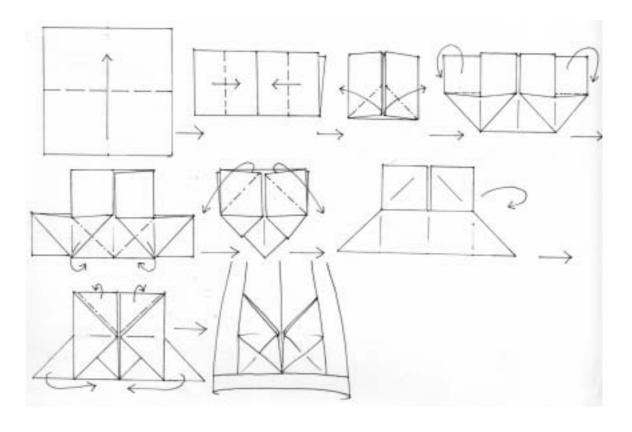
Crane (Iris)



Butterfly (Camellia)



Lily-one petal style (Magnolia)



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