

**ART-4753-51-202420 Scul Mat &  
Processes (Summer 2024)**

**By the Yard**

**Moriah Roland**

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# INTRODUCTION

Digital Fabrication is the process of translating a design from the digital realm into fabricated material. However, at least for our purposes, this is not just a question of digital to material, but also of design and concept. The challenge is in how you chose to translate your design(s) from one form to the next. This process involves intense research, experimentation, patience, care, and lots of trial and error.

Image, Volume, Layers is a decentralized project, in which the main object/design output is presented alongside content related to its conception, process of production, and intent.

Each project should utilize the combination of image, volume, layers in its design process, as well as conceptually - as we consider that language in relationship to histories.

# RESEARCH

## RESEARCH SUB-CONTENTS:

- IDENTIFICATION OF TOPIC/ ISSUE
- INITIAL RESEARCH
- RESEARCH REFERENCES (AS LEAST 3)
- FOCUSED RESEARCH (IMAGE, VOLUME, LAYERS)

# RESEARCH TOPIC/ INITIAL RESEARCH

## WHAT?

This study investigates the implications of 3D printing on fabric, as well as the possibilities or applications of this combination.

## WHY?

While this was not my first choice of options, I eventually decided to pursue it because I thought it was unique and outside of my usual range of creativity. What began as a fascination with a YouTube video evolved into a series of experiments that would later lead to new ideas for how I could apply the experi-

ments. My motivation for the project began and ended with an idea and no real plan, and part of the fun was being able to see it through to the end result.

## HOW?

I translated my process more directly because I had videos to refer to while conducting my research. In short, I adjusted what methods appeared to work for those shown in the videos and adjusted it based on my setup. The most difficult challenge was to keep the pattern stable. When I first started printing, I decided not to use supports because I didn't think I would need them. However, this later proved to be an essential part of ensuring the print was stable enough for me to tape the mesh around the printer bed. In short, I printed my pattern with a raft, then let the printer print the raft and roughly 3 to 5 layers of the pattern, then paused the machine, cut out a small square of black or white tulle, placed the tulle over the pattern, taped it near the edges of the printer bed to ensure it was secure, and resumed the print, where the machine would continue from where it stopped and print over the tulle. After that, I would simply separate the raft from the pattern, resulting in my fused 3D print.

During this process, I was drawn to these

dragon scales or spikes, which I found to be both distinguishable and interesting. I believe the reason for my interest is related to my other two ideas. Which referenced storybooks. Many of my favorite pieces of media often include a dragon or dragons of sort, so I thought the shape of the scales/spikes was reminiscent of that, but also made for an interesting look when combined with the fabric.

### **IMAGE, VOLUME, AND LAYERS**

Throughout my project, I plan to use images as references to animals.

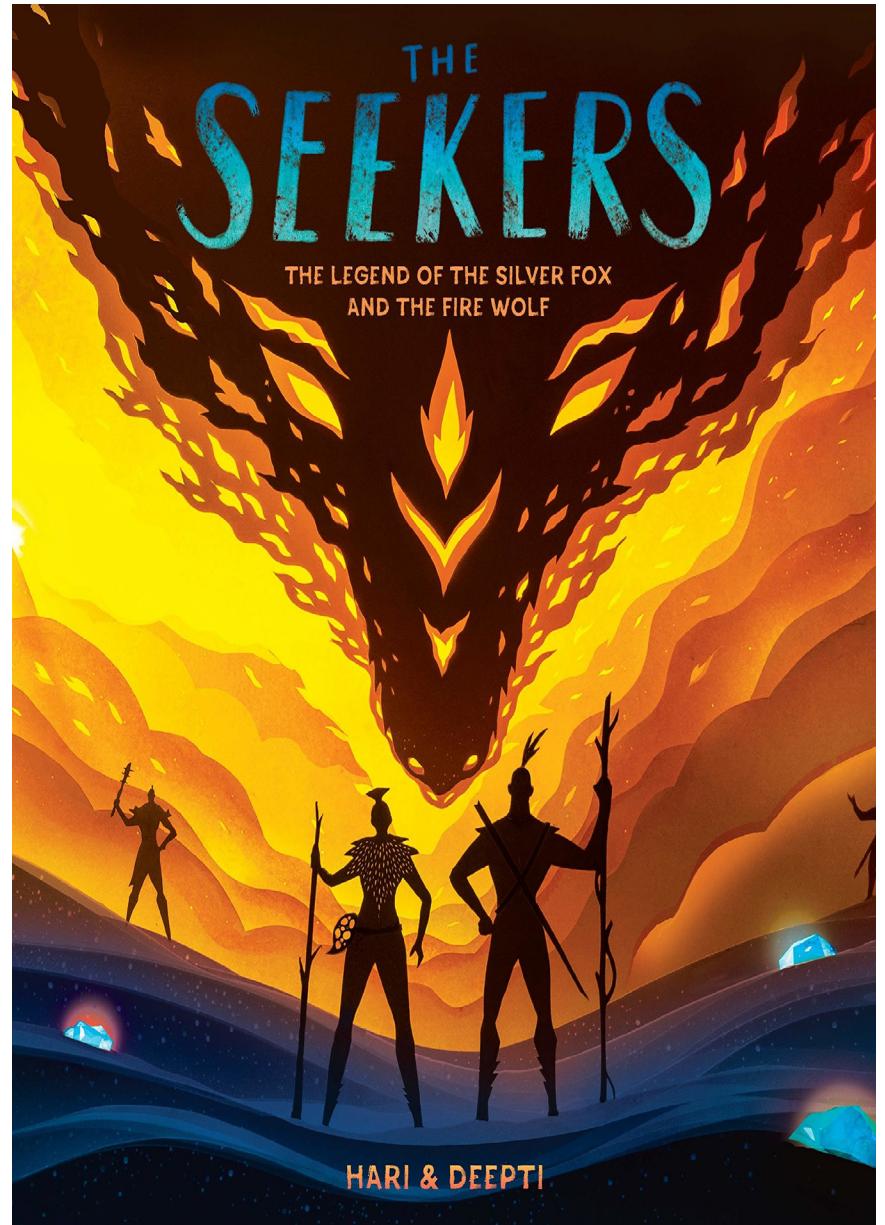
I'll use volume to space these prints so that they fill or fit the shape of my arm.

I'll layer the fabric and 3D print.

# RESEARCH REFERENCE 1

I had the idea of doing a layered cut paper storybook-like scene after previously working with the material, so I researched artists who produced similar work.

Artists Deepti Nair and Harikrishnan Panicker (Hari & Deepti and Johanna Wilhelm are popular for their light boxes and cutouts, which they use to create imaginative scenarios. Drawing inspiration from their travels in Asia and Europe, as well as the book "Amarillo Limón El Sol" (Lemon Yellow the Sun), they use paper as a medium that is both playful and colorful. This medium allows them to reflect light, depth, and illusions, making it suitable for a variety of applications including exhibitions.



MODULO 1

# FESTIVAL DE PAPEL

“JOHANNA WILHELM”

Sábado 16 DE SEPTIMBRE  
de 10 a 13hs



1

PAPER CUT  
Calado en papel

Informes e inscripciones  
[tallerespapercut@gmail.com](mailto:tallerespapercut@gmail.com)

MODULO 2

# FESTIVAL DE PAPEL

“GUARDABOSQUES”

Sábado 16 DE SEPTIMBRE  
de 14 a 17hs



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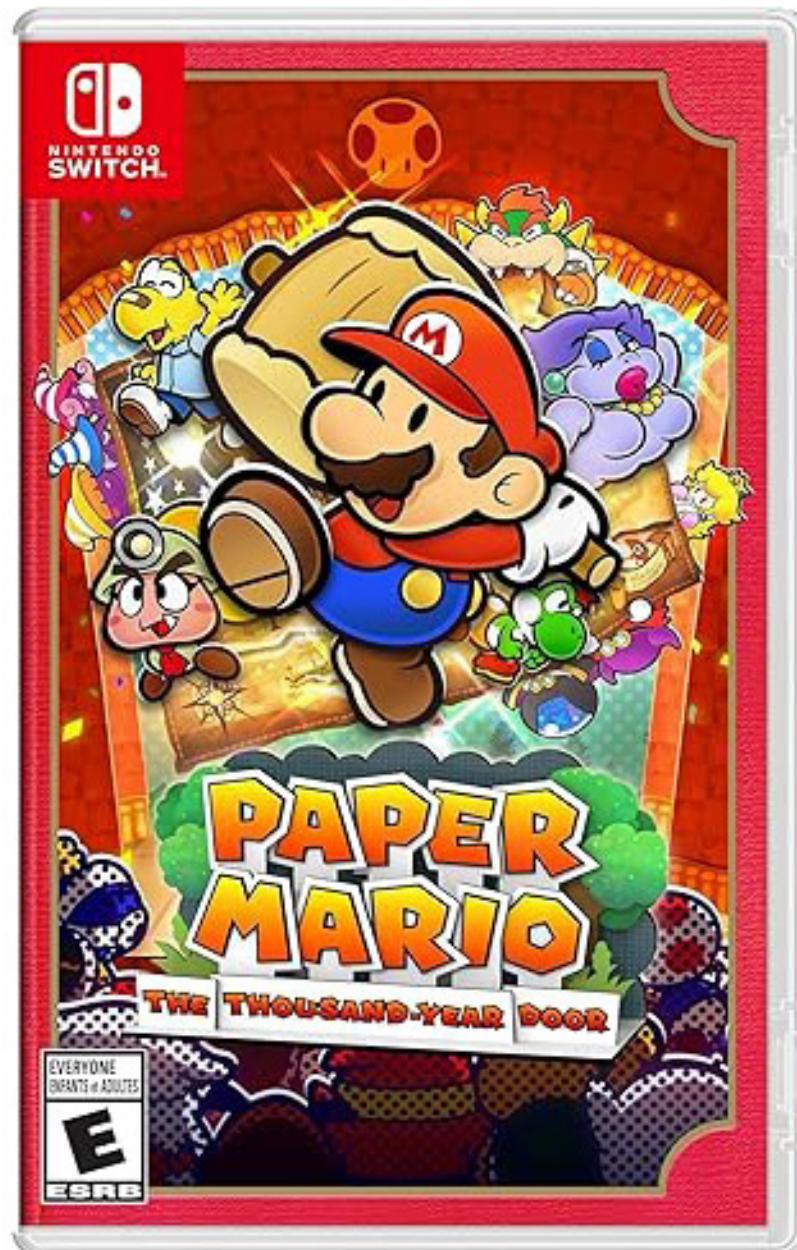
PAPER CRAFT  
Formas volumétricas en papel

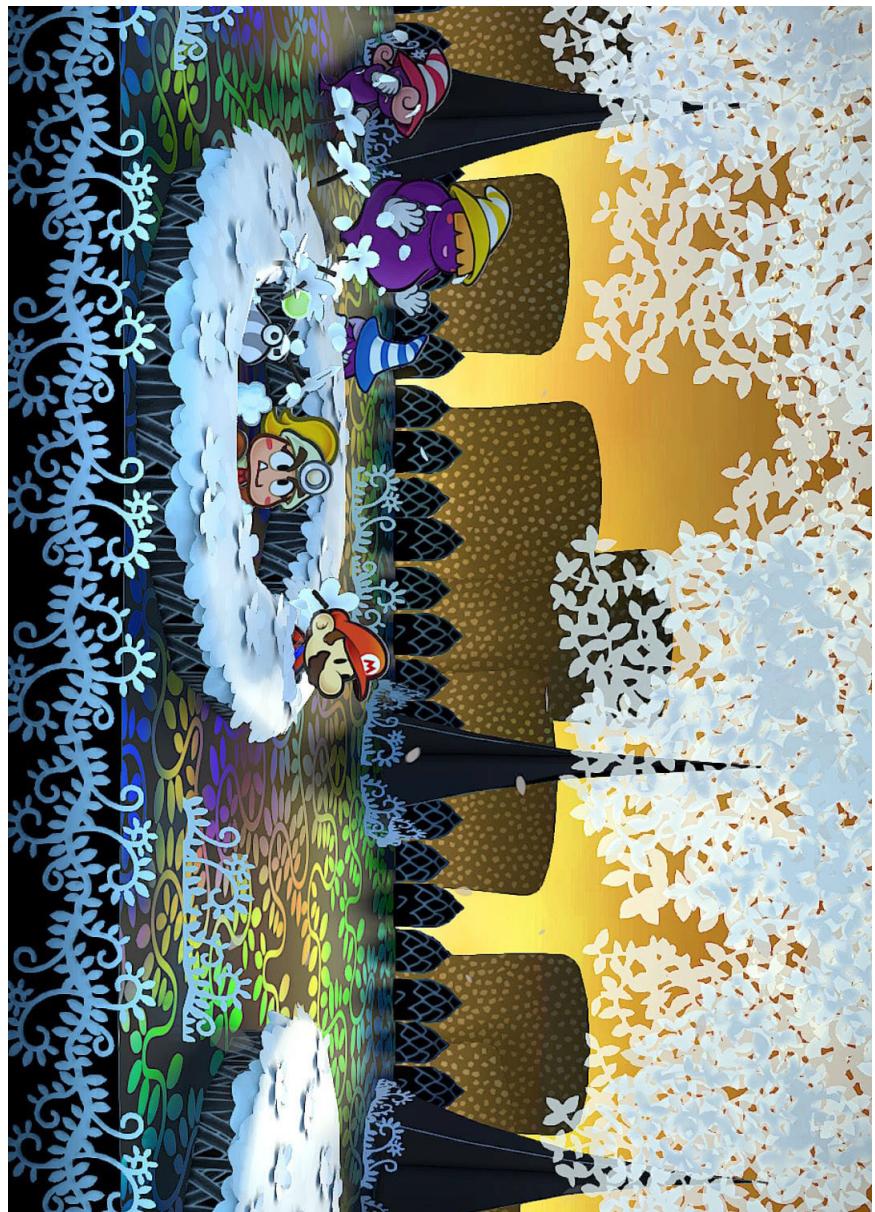
Informes e inscripciones  
[tallerespapercut@gmail.com](mailto:tallerespapercut@gmail.com)

## RESEARCH REFERENCE 2

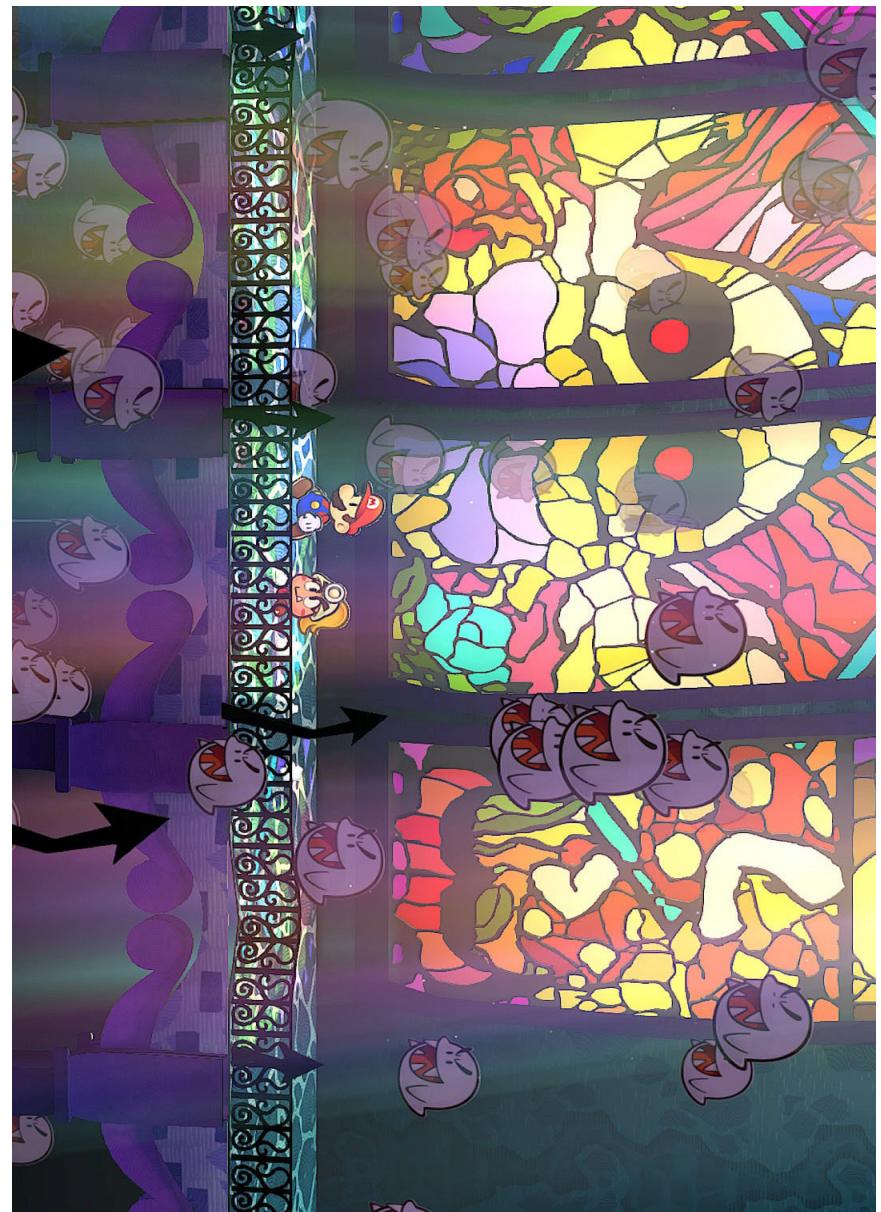
Inspired by the idea of pop-out books, I looked at a video game series I was familiar with and how to imitate its unique art direction in real life.

The art director for the Paper Mario series, Naohiko Aoyama, developed a unique art style for the games that resembles a pop-up book. This approach was inspired by the notion that players might be growing tired of traditional computer-generated 3D graphics. The Paper Mario series is characterized by its light-hearted tone, as well as its references to other video games and popular culture, which provide a refreshing and creative alternative to traditional gaming aesthetics.





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## RESEARCH REFERENCE 3

My third idea was inspired by a few YouTube videos I had seen previously of people 3D printing on fabric, which I found interesting as a potential project.

I'd like to experiment with 3D printing on fabric to see how versatile it is. I have two ideas: incorporate the 3D printing into clothing or adopt a more sculptural approach to creating items such as lamp shades. Influenced by nature, I find inspiration in the works of artists such as Iris Van Herpen and the insights of YouTuber Uncle Jessy. Through this study, I hope to push the limits of 3D printing in new ways.





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# FOCUSED RESEARCH

## IMAGE, VOLUME, LAYERS

My focus shifted a lot throughout the project. Of my three ideas, I chose the one for which I had little to no plan, which I believe resulted in a number of problems ranging from my divided attention to a lot of last-minute decisions, which was very stressful. However, I believe my efforts speak for themselves in terms of how I was able to actualize 3D printing on fabric as a result of my numerous attempts, resulting in me being able to turn them out later in a timely manner. However, I struggled for a long time with actually attaching the prints to the sheer gloves I purchased, which I believe would have made the biggest difference during the presentation if I had not been able to attach them at the last minute. Overall, while I believe that my efforts translated very well in terms of presentation, particularly the sewing, I think that an equally understated aspect of this project for me was how frustrated I was with the process, given that I normally like having a plan and that this entire project was completely unexpected for better and for worse.

## IMAGE

I used images throughout my project, including textures and the animal(s) they may be referencing. For example, the

dragon scales or dragon spikes instantly make you think of a dragon, which was my intention. I tried to select distinct textures that I knew would be recognizable at first glance, which is why I chose those specific textures.

## PROCESS & PRODUCTION

### VOLUME

Volume was a later thought, but after I had a good number of prints, I decided to incorporate volume by attaching the tulle to the sheer gloves I purchased, paying close attention to the placement and spacing of the prints for a unified look.

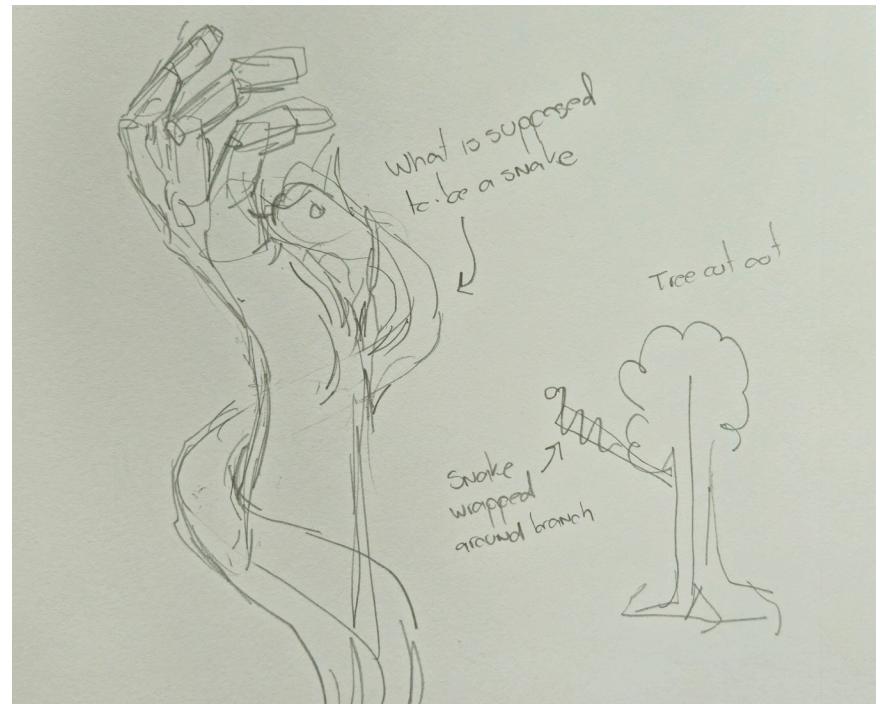
### LAYERS

Layers in my case may be self-explanatory, but the overall idea is layering, as I had to layer or wedge the fabric in between layers of the print, which I then layered on top of the gloves, so the entire process was layering as I had to build one thing on top of another.



Sketch (Ref. 1)

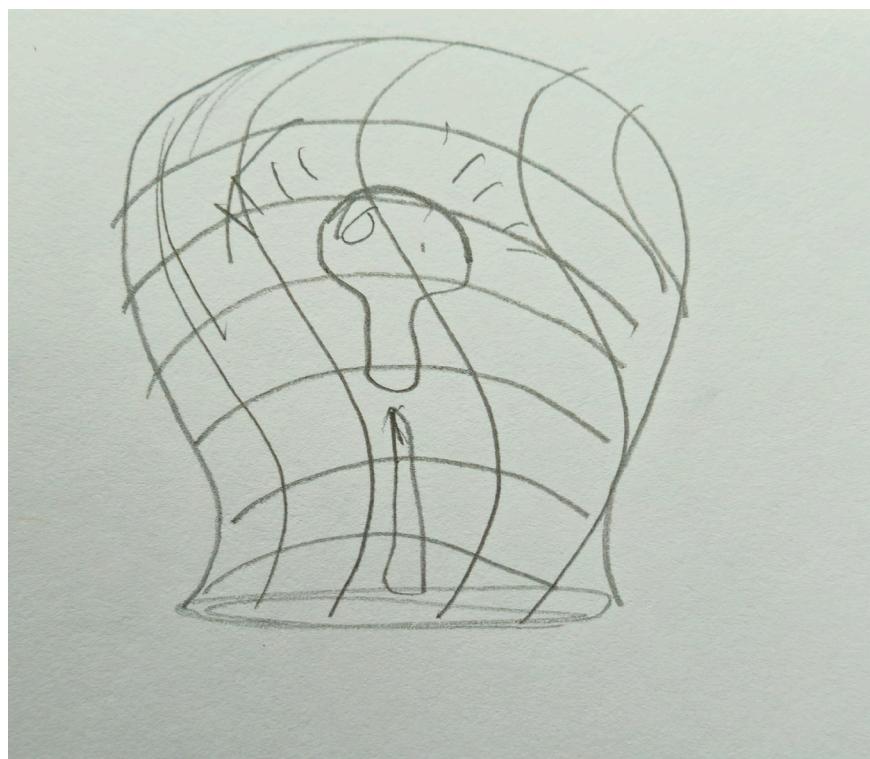
I liked the sound of the first and second ideas, so I made sketches based on them, even referencing specific scenes from various media, such as Arcane and the Garden of Eden.



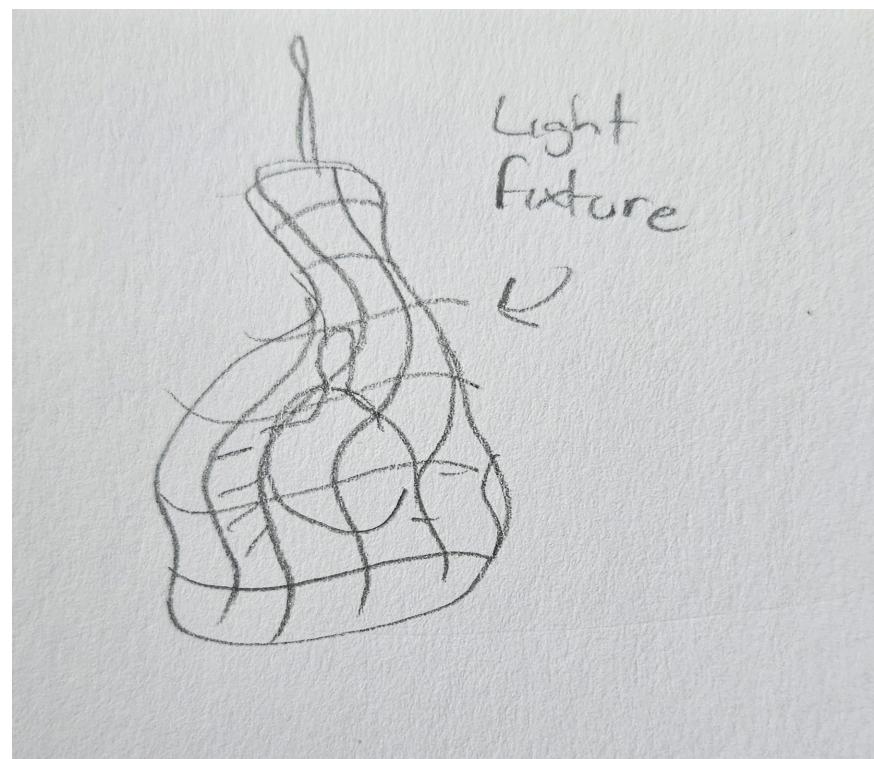
Sketch (Ref. 2)



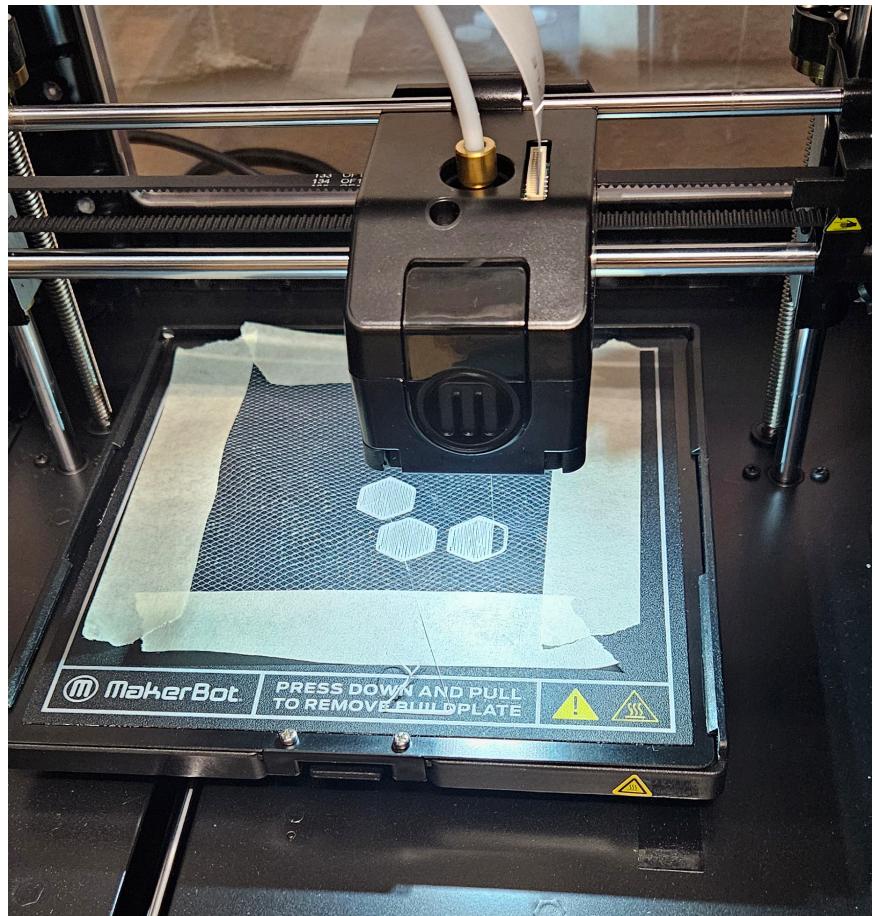
Sketch (Ref. 3)



Sketch (Ref. 3)



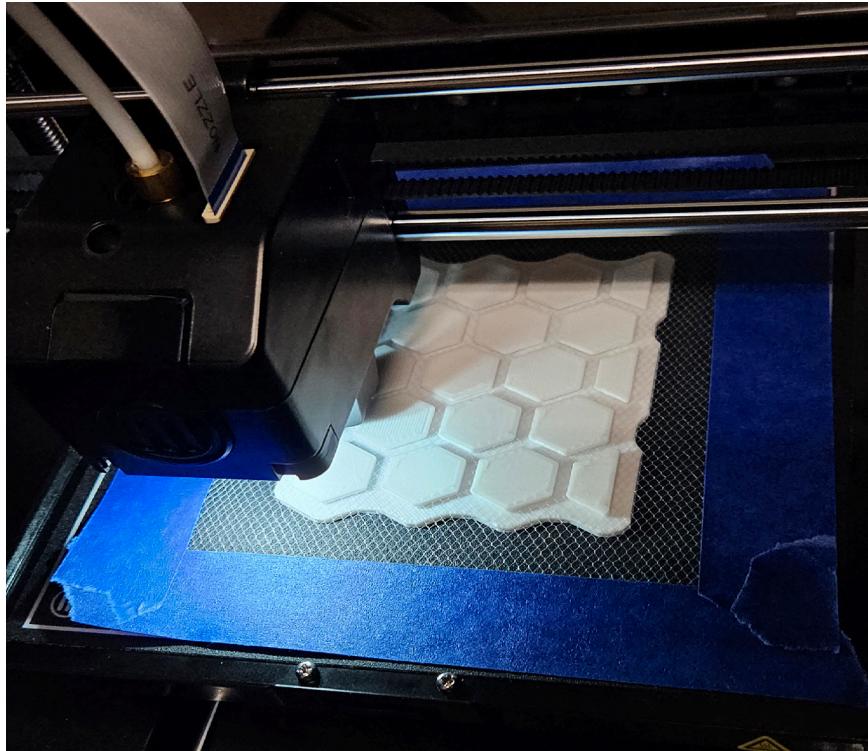
Sketch (Ref. 3)



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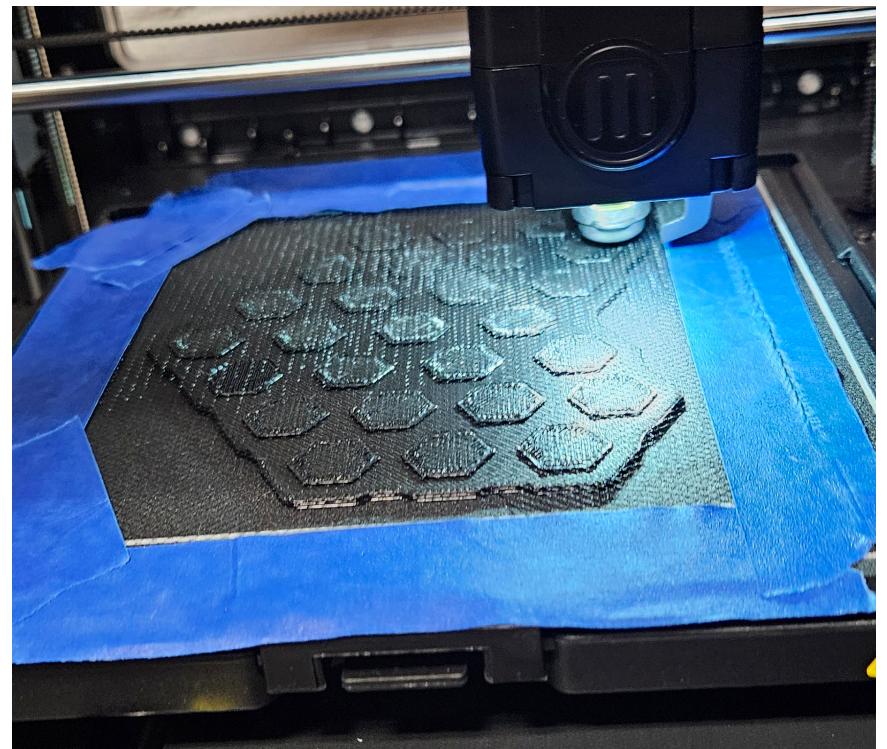


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It was at this stage that I was advised to add a support underneath my pattern to ensure that the pieces did not move around and adhered to a surface, allowing me to later add the mesh, which was successful.

After the previous experiment appeared to be successful, I wanted to try a more complex pattern, so I switched from hexagons to the aforementioned dragon scales/spikes, and the print's early stages are shown below.

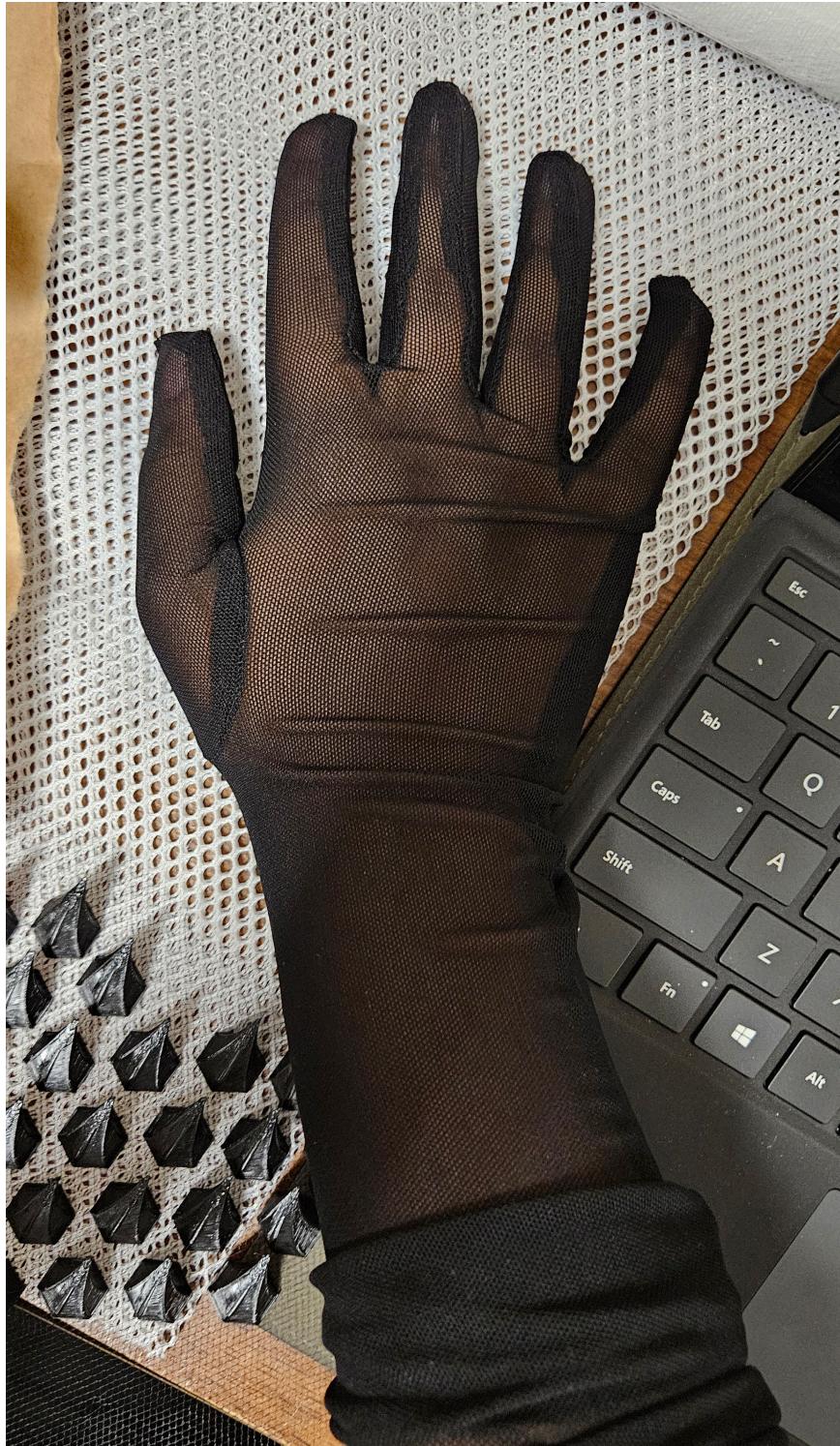




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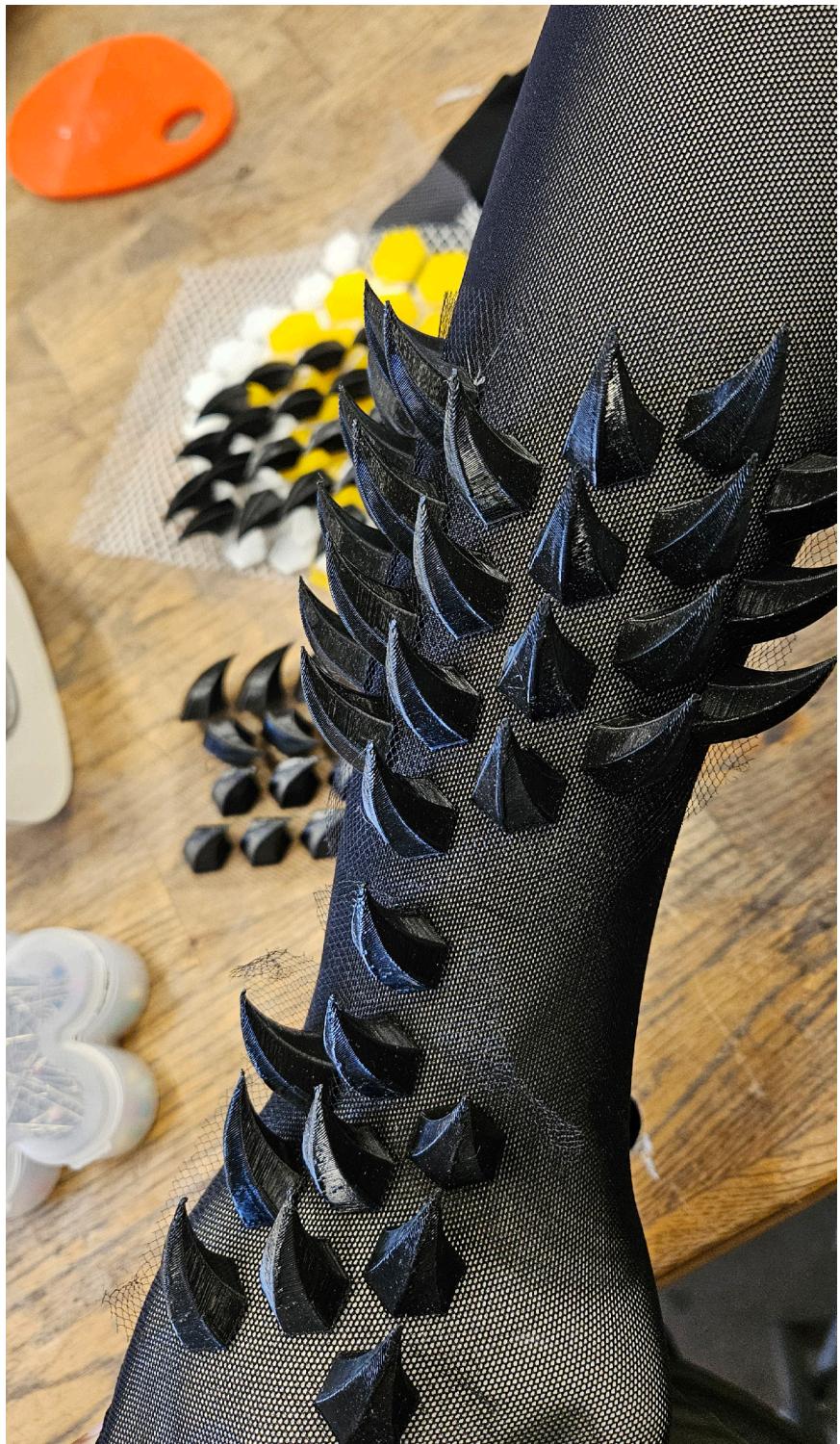


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After I got into the rhythm of making these prints, I wondered how I could make use of the fact that they were flexible. I considered attaching them to my arm in some way to show off the range of motion, so I purchased these sheer black and white gloves with the intention of gluing the prints to the sleeves for a seamless blend between the black and white tulle and the fabric of the gloves. This would later prove to be the most difficult part of the process for me, requiring quite a bit of time and attention; however, the end result speaks for itself.



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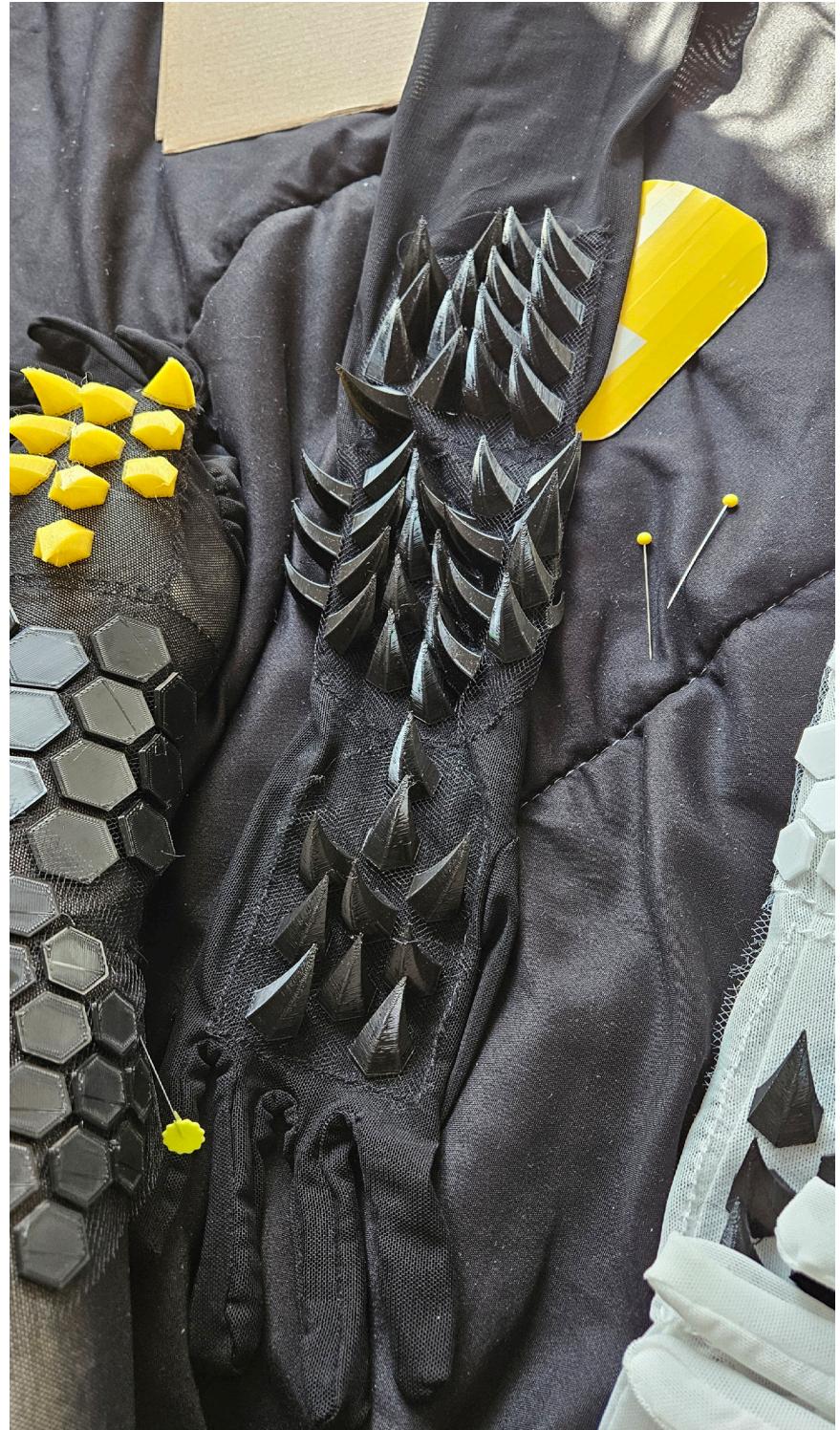
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My project involved 3D printing on fabric, specifically nylon tulle, which is fragile and prone to ripping. The project faced several difficulties, including detaching the supports from the print, sewing the tulle to the gloves, and making clean stitches. Initially, using glue and tape was not ideal, and the prints were sewed to the gloves at the last minute, which was tedious and time-consuming.

The project was a success, however, and my peers were open to the idea and execution. However, I believe there are some areas that could be improved, such as using a stronger fabric, learning to sew, and using different stitches for a more seamless look. Overall, the project was both rewarding and frustrating, but it taught me a lot about fabric and 3D printing, and how to push beyond its limits.

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# OBSERVATIONS & OUTPUTS

The project provided a mix of rewarding and frustrating experiences. As previously stated, I began with no concrete plan, which led to numerous mistakes along the way. While the project was eventually completed, it was not without challenges.

One significant issue was 3D printing on fabric, specifically tulle, which is very fragile and prone to tearing and warping. Early on, I struggled to separate the supports from the print, frequently causing the tulle to rip where I applied too much pressure. I considered using a more durable material, but I preferred the seamless look that tulle provided. As a result, I had to push through the rips and tears.

Another challenge was adhering the prints to the gloves. I first tried using glue and tape, but I was dissatisfied with the unpolished result and the stickiness of the glue, which made putting on and taking off the gloves difficult. The day before the deadline, a classmate suggested hand-stitching the fabric onto the gloves. Despite having never hand-stitched before and lacking the necessary supplies, I accepted their offer of materials and instructions. This last-minute sewing was exhausting; I worked all night without sleep to ensure clean stitches, knowing they would be very visible. Finally, I was pleased with the positive response to the project.

Looking ahead, I see numerous possibilities for improvement. I want to use a stronger fabric that resembles tulle while being more durable. I also want to spend more time learning different stitches to achieve a smoother finish when maybe sewing prints to other garments. Exploring new applications for 3D printing on fabric is another goal, as I want to push the technology's limits even further. Furthermore, I'm interested in playing with painting, as the gloves appeared most impactful when all materials were the same color, giving a more cohesive and professional look. While the colored filaments added a playful touch, the all-black gloves with black scales stood out the most.

Overall, I learned a lot about sewing, fabric, and the limitless potential of 3D printing. With more experience and knowledge, I'm excited to revisit this project in the future.





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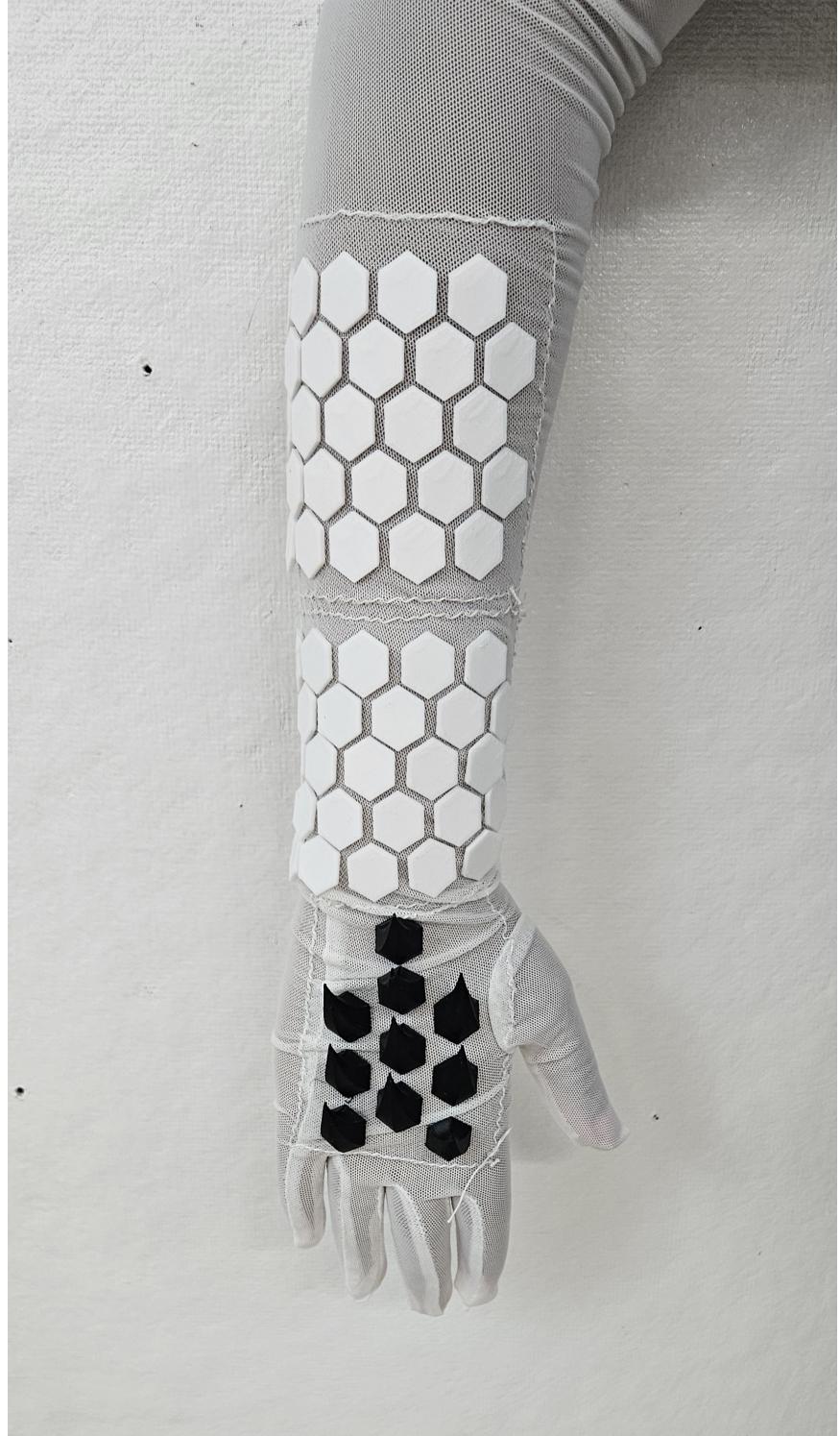
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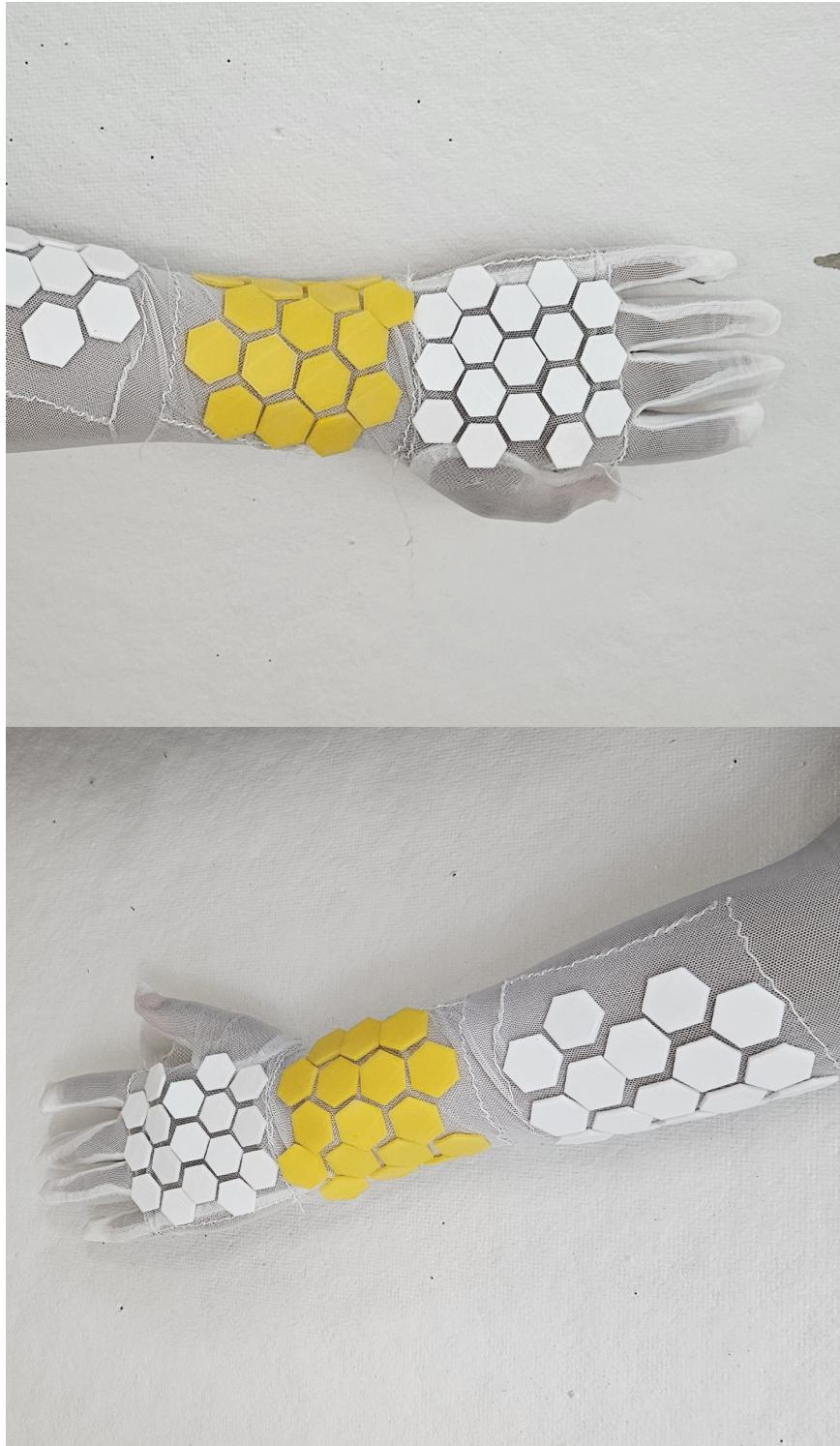
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**THANK YOU - MR**