Case Study

Traditionally Modern: Bridging Ancient Indian Culture with 3D Printing at the Fashion Institute of Technology

> “This is museum grade work. This is beyond a college fashion show.

Amy Sperber
Asst Professor, FIT

The “Traditionally Modern” design by Hemani Kumar is a stunning example of how traditional Indian culture can be blended with modern 3D printing technology to create contemporary fashion.

"Blending the old with the new" is something fashion designers do every single day. From modern twists on past trends, to futuristic runway ensembles that are reminiscent of your grandmother's wardrobe staple.

But when Fashion Institute of Technology (FIT) student, Hemani Kumar, blends old and new, she takes it to the extreme.

Uniting ultra-modern 3D-printed embellishment with traditional influences, she forms a bridge between ancient Indian culture and the future of fashion.

Challenge

Hemani's goal was to reimagine the traditional sari - steeped in centuries of cultural significance - as a modern garment.

"I wanted to create a piece that embraced this heritage, while shifting to a more modern outlook. Creating a bridge between the old traditional sari and what we now believe a sari could be and contrasting old, beautiful designs with modern technology," explains Hemani.

FIT is part of the State University of New York and is lauded as "an MIT for the Fashion Industries". 3D printing has been embraced by the fashion world, due to the ability to print rigid, lightweight structural pieces, embellishments, and fixings with textures and effects that could not possibly be reached with traditional methods. Although the technology is relatively new to the industry, FIT has made a variety of applications available to students for their design projects. Iris van Herpen was one of the first in the fashion industry to use 3D printing, and Hemani hails the innovative Dutch designer's work as her inspiration.

With the support of Assistant Professor at FIT, Amy Sperber, an evangelist for the use of 3D printing in fashion, Hemani set about modernizing the traditional sari, taking inspiration from both Western culture and her Indian roots to create a contemporary piece.

Hemani Kumar, a graduate of the Fashion Institute of Technology and the designer of the "Traditionally Modern" sari.

"Without Stratasys's direct-to-textile 3D printing technology, it wouldn't have been the same piece.

Hemani Kumar
Graduate, FIT

Solution

Hemani worked together with the Stratasys fashion team to turn her designs of astonishing 3D embellishment sections for the collar, sleeves and legs into reality.

Stratasys 3DFashion™ is a powerful 3D printing technology that is transforming the fashion industry with direct-to-textile printing in full color. Clear print and perfect adhesion on a variety of fabrics enables designers to create spectacular designs and fantastical optical illusionary effects with color and light.

In order to ensure that the whole design reflected a cohesive look and feel, the colors in the embellishments were mimicked in the floral print on the bodysuit and the collar piece is cut to follow the contours of the neckline.

“I learned so much in a single semester! I ran into several problems that I had to overcome; it was such a steep learning curve for me,” says Hemani.

“For instance, the mesh fabric had minimal stretch after it had been 3D printed, so my seams were harder to match. And it was hard to get the embellished fabric into the machine. I broke so many needles! But in the end the whole piece came together and looks cohesive.”

Hemani’s design embellishments were 3D printed on the Stratasys J850™ TechStyle™. This direct-to-textile 3D printer ensures superior surface adhesion as the mesh fabric is “sandwiched” between thin layers of resin.

Image taken during the design process offers a glimpse into the future of fashion and the exciting possibilities presented by 3D printing technology in creating unique and innovative designs.

> “There is a generation ready to express their designs in a new way.”
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> Amy Sperber
> **Asst Professor, FIT**

Impact

Not just cohesive, Hemani's design was a huge hit at FIT's Future of Fashion 2023 show, and Professor Sperber is clearly impressed with Hemani's achievement: "This is museum grade work. This is beyond a college fashion show." Vogue was in attendance, and Hemani's design was praised in the magazine's coverage of the event.

Professor Sperber is excited about the future of fashion with 3D printing technology: "This technology is the missing link of the engineering aspect of fashion design. It will have far-reaching applications for closures and accessibility as well as creating structural pieces and embellishments like these. This technology will change everything. It won't be an overnight change, but there is a generation ready to express their designs in a new way."

Hemani expounds how the 3D element of the design is part of the whole garment from concept to creation, not simply an addition. "Aside from the speed of 3D printing directly to the fabric, versus sewing or gluing individual embellishments, it just wouldn't have been possible to get the same effect. The 3DFashion design team at Stratasys has enabled me to create something unique. Without their direct-to-textile 3D printing technology, it wouldn't have been the same piece".

The sari is travelling back to India with Hemani after graduation, where she has plans to create a line of garments with 3D printed elements in a similar vein. We are delighted to have been part of her show-stopping creation, and excited to follow her career!

Image, courtesy of Vogue magazine, shows the "Traditionally Modern" design by Hemani Kumar. The model is wearing the sari with its 3D-printed embellishments on the collar, sleeves, and legs.

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