

EMPLOYABILITY OF DIGITAL TECHNOLOGY FOR USING IMAGE PATTERN AND WEAVE STRUCTURE FOR DOUBLE DESIGN

Jiya Agarwal

Shirdi Sai Public School
Moradabad, U.P.

ABSTRACT

Advanced innovation can open up new doors for the Jacquard texture to give novel types of embellishing textures. Notwithstanding shading, surface, and material, various layer organization, for example, the twofold fabric, is viewed as a critical plan component. In utilizing the customary winding around strategy, twofold material plan highlights are restricted to digest styles (i.e., stripes and shading blocks). Nonetheless, conveying computerized innovation makes it feasible to portray a much-confounded style on the two sides of a texture. Two recognized pictures are acknowledged through weft yarn shades of which face and back layer similarly offers remarkable plan curiosity that was impractical with existing winding around techniques. Hence, this concentrates on first investigating a weave structure improvement equipped for introducing pictorial pictures on the two sides of a texture. When the weave structure design is settled, further investigation is completed with the CMYK shading strings to investigate the chance of growing a weave shading capacity for twofold material. Given the two kinds of research outcomes, weave structure and the picture design configuration are disclosed to propose new types of current twofold material.

1. INTRODUCTION

Twofold material has no less than two arrangements of twist and weft yarns produced texture to frame the various countenances and backcloths (Watson and Grosicki, 1977). Two particular plan figures autonomously exist in a piece of fabric by exchanging two gatherings of twist and weft strings; notwithstanding, conventional winding around limits configuration figures to extract styles like stripes, mathematical shapes, and shading blocks (Shenton, 2014). As twist strings are gathered through shafts, shedding is restricted compared to plans in variety on a conventional loom. Interestingly, as each twist string is strung into individual snares in the present-day computerized winding, higher capacity and adaptability results from the loom setting (Ishida, 1994). In this way, interlacing non-literal themes becomes feasible for twofold material. Advanced winding around shares a similar focus rule (i.e., twist segment, weft float plan) as customary winding around; nonetheless, as picture examples and weave structure are planned through material CAD (Computer-helped Design) framework, comprehension of the computerized plan processes become essential to use and investigate for additional opportunities.

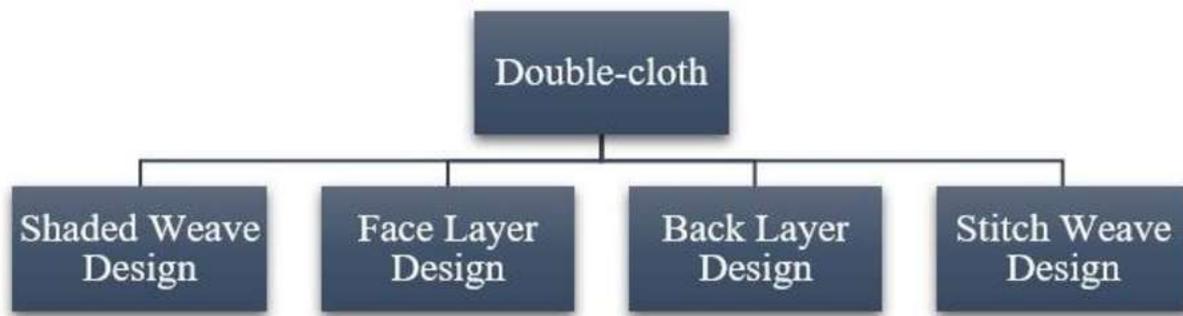


Figure 1: Design structure of modern double-cloth

States of picture examples like tones, shades, and surfaces are viewed as following weave structures as they are the way to understanding the applied plans through getting sorted out twist and weft strings (Kim, 2014; Kim, Ng, Zhou and Hu, 2016b). This study centers around a concealed weave structure design as its plan is upgraded to recreate non-literal picture designs in a characteristic concealing impact (Ng and Zhou, 2009a; Kim, Ng, Zhou, and Hu, 2016a). Given a fundamental sateen weave design, the weave structure is changed over through four cycles for computerized twofold material: 1) concealed weave plan; 2) face weave plan; 3) backing weave plan, and 4) fasten weave configuration (Figure 1). When the size of the sateen weave is chosen, it is formed into a concealed weave series (Zhou, 2011), and the individual concealed meshes are changed into face and sponsorship winds by adjusting the lifting plan of the twist. The two arrangements of twist and weft strings are entwined to show two particular facial and back figures. For example, the face picks entwine face closes as per the face weave game plan, and the back picks just interweave back closes as indicated by the back weave. Ultimately, sewing focuses are added to both face and support winds around (Ng and Zhou, 2009b). In this review, two investigations are disclosed to present novel twofold material plans drawn nearer by utilizing an electronic Jacquard loom furnished with a solitary shading twist (greyish) set inconsistent style.

First and foremost, the test centers around weave structure improvement to acknowledge two particular pictures on both texture sides. Two weft strings are appointed to confront and back layers to make two examples in various tones introduced in a characteristic concealing impact. Significant tasteful upsides of intertwined string tones are similarly conveyed on the two sides of a texture. The key in the main preliminary is trying to portray complex pictures on each side of a material. When the winding around strategy is affirmed for the twofold material creation, one more examination is done to investigate the capability of amplifying a weave shading extension for twofold fabric plan advancement. Weft tones are chosen by sending CMYK shading hypothesis in light of the four essential techniques (i.e., cyan, maroon, yellow, and dark) (Kim, Ng, Zhou, and Hu, 2014; Kim, Ng, Zhou, and Hu, 2017). The shades of the weft are matched (for example, [M]+[Y] and [C]+[K]) and applied to each side of a texture to show a characteristic concealing impact achieved by two string shading blends. The basic standard of weave structure configuration remains equivalent to the preliminary test; however, one more

arrangement of concealed weave series is made to line up with the other weft strings (Ng and Zhou, 2009a; Ng, Kim, Zhou and Hu, 2014). This study clarifies the computerized picture examples and weave structure plans exhaustively founded on the investigation results.

2. METHODOLOGY

In utilizing practical editorial manager programming, for example, material CAD and Photoshop, both picture example and weave structure are planned in advanced designs by which incredible proficiency and accommodation are gotten on the side of the computerized innovation. Various receptions can be used and applied in picture adjustment, shading the board, and weave structure plan by which strict and tedious Jacquard configuration processes are compressed. Shadings, themes, and surfaces of woven Jacquard textures depend on the cooperation between picture examples and weave structures. Subsequently, understanding the two center fields related to advanced innovation is essential in this review.

2.1 Pattern plan for two fold fabric

An advanced picture in 8-digit tone is considered adequate for a design plan in which the shades of an image are shown inside 256 techniques (Zhou, Tang, and Hu, 2011; Kim, Ng, Zhou, and Hu, 2016a). In utilizing material CAD frameworks, twofold fabric design plans are recommended differently. For instance, hand-painted pictures are examined and transferred to the CAD framework. Examples can be planned using practical manager programming, or photos are straightforwardly taken from advanced cameras.

In conventional winding around, the plan figures of twofold fabric are frequently acknowledged with mathematical shapes and shading blocks. By trading, the twist and pick assemblies of the front and back layers, tones, or material contrasts show up as plans on each surface. Hence, this study is planned to grow the application extent of twofold fabric configuration by utilizing computerized innovation. As Shown in Figure 2, the examples allowed to a front layer and reverse layer are planned in a considerably more muddled style to explore different avenues regarding two gatherings of twists and wefts through limitless shedding. Weave structures are designed to relate to the subtleties of examples and shading conceals. In light of the concealed weave series, face and sponsorship weave structures are created by sorting out two gatherings of twists with which two weft strings are applied to make the distinct layers. In the principal analysis, growing twofold material weave structures are centered around to affirm the chance of portraying pleasant picture designs.

Making a vast extent of weave tones is complex as a predetermined number of weft yarns is material to advanced Jacquard loom. Subsequently, further examination is completed to investigate the capability of broadening a doable weave shading degree by utilizing the essential shading strings of the CMYK framework. As the shading bunch is enthusiastically suggested for recreating numerous shading pictures in woven structure, designs are planned given the CMYK shading hypothesis following a solitary hued (greyish) twist setting (Kim, Ng, Zhou, and Hu, 2017).

2.2 Weave construction plan for two fold fabric

The twofold fabric weave structure is created through four stages (for example

- 1) concealed,
- 2) face,
- 3) support and
- 4) sewing.

Right off the bat, when the weave rehash of sateen is chosen, it is made into a concealed weave series by adding ordinary intertwining focuses. The interlacement expansion rehashes until complete interlacement is left with most miniature sewing focuses in a weave rehash (Kim, 2016). As Figure 4 shows one of the models, a 12-string sateen mesh is made into a series by adding 12 interlacements each time where 11 individual concealed weave structures are acquired in a series.

The achievable concealed winds are expected once weave rehash and interlacement increment are chosen. As the absolute number of interlacements is bit by bit and consistently involved, the accompanying plan (1) is utilized to forecast the weave number (Kim, 2014). Where T is the absolute number of intertwining focuses in a weave, W is a weave rehash, and E shows the improving marks of interlacement applied each time.

In single color double-material creation, when a similar size of a weave is used to both texture layers, and string interlacements are organized identically, ideal circumstances are gotten for restricting individual layers. As the wind at a similar relative point is kept up within winding around, sewing focuses are applied consistently (Watson and Grosicki, 1977). An impression of the hypothesis, face and support wind for a solitary shading twofold fabric is not just planned in a similar recurrent size (e.g., (A) and (B)) yet additionally the beginning stage applied to the two layers are indistinguishable in this review as Figure 5 shows an illustration of concealed weave structures.

Conversely, while planning the two-shading twofold fabric, applying two unique arrangements of concealed winds around are recommended with various beginning stages (D) and development numbers (E). In the correlation of the two cases (e.g., (C) and (F)) of concealed weave mixes (Figure 5), when two indistinguishable (A) and (B) winds around are joined for making one layer. Their interweaving focuses (C) show up in an indistinguishable spot. For this situation, broken streaks effectively result when the high thickness is applied underway. Besides, string colors displayed on a superficial level collect in one spot in which the blend of string tones is seen in a less excellent condition (Kim, Ng, Zhou, and Hu, 2016). Thus, for twofold shading material, two unique (D) and (E) winds around are planned and joined together as the interweaving focuses (F) don't happen at similar places, nor do string colors display. Subsequently, two arrangements of concealed weave series are recommended for keeping a weave structure balance and disseminating interweaving focuses for two-shading twofold material.

There are various approaches to integrating two layers (i.e., adding sewing focuses or sewing strings). In this audit, a self-sewing strategy is applied to the two examinations wherein any additional line is normal beside the face, and back layers as sewing centers are made by meeting face and back interlacements. For instance, while face picks are lacing, the vast majority of the completions selected to back layers are brought down for parcel, passing on a couple of decisions of the back layer to get together with face picks. While adding sewing centers, their circumstance should be essentially just about as standard as possible to thwart disproportionate strain and reduce wind breakage during creation. Figure 7 shows one of the compound weave structures with sewing centers added to defy and back layers. While sewing centers are precisely situated, the standards don't influence either the face or back of the material (Watson and Grosicki, 1977).

3. EXPERIMENTS

Table 1: Double cloth technical setting

Composition	Weft (experiment 1)	Weft (experiment 2)	Warp
Material	100% cotton	100% polyester	100% cotton
Thread color	Brown/blue	Cyan/ magenta/yellow and black (K)	Off-white
Yarn count	150 denier	150 denier	150 denier
Color filling density	120 picks/inch	120 picks/inch	96 ends/inch
Pattern repeat	12 inch (w) x 7.8 inch (h)	12 inch (w) x 7.5 inch (h)	N/A
Jacquard machine	Bonas electronic Jacquard		
Total hooks	3456		
Hooks/inch	96		
Total hooks/design	1152		
Weave repeat	12-thread sateen		
Shaded weave variety	37 derivatives		
Software applied	Photoshop CS6/Scotweave		

In light of the picture example and weave structure plan, two analyses are directed to test the weave construction and shading development for the current advanced twofold fabric. The face and back layers of pictures are decolorized to arrange each shade level of an image. At the same time, a 12-string sateen mesh is formed into a concealed weave series by adding three interlacements each time, from which 37 concealed winds around are accomplished in every series. All concealed weaves are altered for the twofold material weave design though the greyscales of each picture are decreased from 256 to 37 to line up with individual buried weave structures (Kim, Ng, Zhou, and Hu, 2016a). This review applies three self-sewing focuses to each face or support wind to integrate the two layers.

The preliminary examination highlights two weft strings for portraying pictorial pictures in a characteristic concealing impact on the two sides of a texture. The face layer is made by matching an earthy colored line and an odd number of twist strings, while a blue series is entwined with a considerable number of twist strings for the production of the back layer. Interestingly, the

subsequent examination consolidates two shades of weft strings in a characteristic concealing impact fully intent on testing the chance of extending a weave shading degree for a twofold fabric plan. The essential shades of the CMYK framework are combined and applied to each side. Maroon and yellow strings are coupled for the face, while cyan and dark are gathered for the back layer. Table 1 shows the winding around particulars applied to the two investigations. For the formation of advanced winding around records, Scotweave, the material CAD programming, is utilized, and for the example creation, the Bonas electronic Jacquard machine is used. Given the weave structures created from the 12-string sateen, the expanded weft thickness (120 picks/inch) is applied to the two investigations to accomplish legitimate solidness.

4. RESULT AND DISCUSSION

The principal analysis highlights two weft strings to inspect the chance of pictorial pictures in the twofold material configuration. The 12-string sateen is formed into face and support winds around and lined up with picture designs. As displayed in Figure 8, weave construction and example configuration are effectively consolidated to create designs in the woven structure. At the same time, the average concealing impact is successfully achieved through the concealed weave structure format.

While planning the picture example and weave structure, the arrangement of the Jacquard loom is considered as there are impediments on the two perspectives. In this investigation, the twist is set with 96 finishes/inch, and hence a weave rehash ought to be chosen as one of the typical products of the twist set (96 closures/inch). Thus, the 12-string weave rehash is selected and produced for the twofold material creation to arrange string floats in a balanced-out condition. Then again, while planning the picture design, as the outfit of the 36-inch wide Jacquard loom is set to give three example rehashes with 3465 snares altogether, the width of the picture design is restricted to 12 inches (34 inch/3) with 1152 snares (3456 snares/3) (Table 1).

In light of the primary test's outcomes, a further test is done to improve the ability to embrace more extensive shadings and themes for a twofold fabric plan. The weft strings highlight the CMYK essential gathering. The four tones have extraordinary potential to broaden a weave shading degree for the generation of pictorial pictures in automatic winding around (Kim, Ng, Zhou, and Hu, 2017). As Figure 9 shows the subtleties of the face and posteriors of the two-shading twofold material texture, the blend of two weft strings is effectively introduced in a characteristic concealing impact by making a reasonable division among face and back layers (Figure 10). The primary rule of weave structure configuration is gotten from the underlying test of single-shading twofold fabric. Yet, two unique arrangements of concealed weave series are applied to every weft string of the face and back layers. Contrasted and single-shading twofold material, weave structure configuration turns out to be considerably more perplexing when face and back winds around are consolidated.

The applied speculations of picture example and weave structure are demonstrated through two examinations for current twofold material plan advancement. Based on the themes and shadings tried in this review, can form present-day twofold material into more extensive elaborate settings (Figure 10).



Figure 3: Experiment of two colour double-cloth

5. CONCLUSION

Two trials are directed for the current twofold material plan improvement, and numerous perspectives have been approved. The exceptional twofold confronted textures conveying an equivalent tasteful worth on face and back layers are exhibited and presented by the investigations. Right off the bat, weave structure configuration is verified through a single-shading twofold fabric in which two different pictorial pictures are effectively formed in a characteristic concealing impact. Given the weave structure advancement, further investigation is completed with CMYK strings to expand a weave shading extension for improvement of the current twofold material plan. The two-shading twofold fabric try model is emphatically ensured while joining two shading strings in a characteristic concealing impact. As a twofold material plan with a more extensive weave shading degree proposes changed scopes of elaborate textures in various examples and tones, further improvement on two-shading twofold material is prudent with picture designs shown in a more extensive range of styles for unique uses like an extravagant piece of clothing textures, outfitting textures and enhancing materials.

REFERENCES

- [1] Grosicki, Z. (Ed.). (2014). Watson's advanced textile design: Compound woven structures Woodhead Publishing., pp.108-189.
- [2] Ishida, T. (1994). Innovations in weaving machinery: the course of loom development. Osaka Senken Ltd..
- [3] Kim, K. R. (2014). A study on structural optimization and color mixing systems of digital jacquard textile based on full- color compound structure (Doctoral dissertation, The Hong Kong Polytechnic University), pp. 74-110.
- [4] Kim, K. R., Ng, F., Zhou, J., & Hu, J. (2016a). Gradient color deviation in woven textiles to correspond to pictorial images in diversity. International Journal of Fashion Design, Technology and Education, 9(1), 32-40.

- [5] Kim, K. R., Ng, F., Zhou, J., & Hu, J. (2016b). Diamond-shaped shaded weave series created by transforming small twills to enrich the surface texture of woven Jacquards. *Textile Research Journal*, 86(10), 1032-1040.
- [6] Kim, K. R., Ng, F., Zhou, J., & Hu, J. (2017). Pigment mixing effect realized with pre-dyed opaque yarns for Jacquard textile design development. *Textile Research Journal*, 0040517517741153.
- [7] Ng, M. C. F., & Zhou, J. (2009a). Innovative layered-combination mode for digital jacquard fabric design. *Textile Research Journal*, 79(8), 737-743.
- [8] Ng, M. C. F., & Zhou, J. (2009b). A study on figured double-face jacquard fabric with full-color effect. *Textile Research Journal*, 79(10), 930-936.
- [9] Ng, M. C. F., & Zhou, J. (2010). Full- color compound structure for digital jacquard fabric design. *Journal of the Textile Institute*, 101(1), 52-57.
- [10] Ng, F., Kim, K. R., Hu, J., & Zhou, J. (2014). Patterning technique for expanding color variety of Jacquard fabrics in alignment with shaded weave structures. *Textile Research Journal*, 84(17), 1820-1828.
- [11] Henton, J. (2014). *Woven Textile Design*. Laurence King, pp. 182-189.
- [12] Zhou, J. (2011). Research and creation of printing-like effect digital jacquard fabric. In *Advanced Materials Research* (Vol. 295, pp. 2568-2571). Trans Tech Publications.
- [13] Zhou, J., Tang, L. Q., & Hu, D. T. (2011). Grey Simulative Effect Digital Jacquard Fabric Design with Full-Color Compound Structure. In *Advanced Materials Research* (Vol. 332, pp. 663- 666). Trans Tech Publications.