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Pattern Matching for Misaligned Seams of Checked Texture over 3D Human Model

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ABSTRACT

Digital Surface Modeling has started to play a vital role in designing woven and knitted fabrics. Designing has changed its dimensions from 2D, 3D to 4D and real time simulation under complex virtual designing environment. There has been huge development and advancements in virtual outlining environment. This study is about coordinating the misaligned creases of checked texture in the article of clothing parts over the virtual human work display. Deformalities in planning that happens for the most part because of the untalented outlining unconscious of the crease misalignment amid the post planning process which may bring about defective after generation of genuine article of clothing. This is material to the edges, crease positions, inseam positions, trim line arrangement and numerous different regions. To beat the counterbalances in these territories advanced coordinating of piece of clothing parts will help in precise texture cutting which will bring about correct coordinating of article of clothing part in edges and creases. This strategy guarantees a well set article of clothing to the correct crease position and parts arrangement over the model. This strategy is relevant to both 2D and 3D outlining environment.

Keywords :- Seam, Pattern, Model, Simulation, Design

I. INTRODUCTION

Propelled PC advancement has had a remarkable impact in the field of arranging. Progressions in computerization, PC delineations and its applications in PC upheld arrange have especially changed the fashioner's workplace. By and by painting and 3D rendering programming make it less complex to make about photorealistic renderings of different varieties at different scales. For examination, the organizer used to make scaled specific drawings, and balance these with numerical tables of human degrees to make sense of whether these fit. By and by databases of 3D models of anthropometric data can quickly give information about obliged sizes to pleasing, profitable and safe operation. [1][2]

Dress reproduction instruments are utilized as a part of the article of clothing industry to outline and test pieces of clothing before the assembling procedure. Apparel reproduction instruments fit the necessities of the piece of clothing industry, centering the recreation and perception trait. Reproduction devices let the originators to make 3D garments in view of 2D examples [3]. More than a very long while PC supported outlining has assumed a premier part in garments manufacture prepare. PCs have ended up being an inescapable apparatus for plan creation and control. [4][5][6]

A fabric is a flat surface object composed of fibrous products. There are several different methods of fabric manufacture like weaving, knitting, non-woven, crocheting, netting, knotting, braiding etc. Weaving is a process of fabric manufacture producing orthogonal fabrics by interlacing together two elements; the warp and the weft yarns having a mutually perpendicular axis; which interlace at right angles at different binding points (Giovanni Castelli et al., Oct 2000).

Surface showing is a more unpredictable procedure for addressing objects than wireframe showing, however not as current as solid showing. Surface showing is extensively used as a piece of CAD (PC arranged) for portrayals and basic renderings. It is furthermore used as a piece of 3D vivacity for entertainments and different introductions [7]. Checked surfaces shape even and uneven check boxes that are even-handedly appropriated over the surface. Checked surface may be printed which is clear just on the face side of the surface or yarn shaded watches that is unmistakable on both the sides.

There are wide classes of checked surfaces in the market. A Gingham generally touches base in a checked case and is perceived by white and tinted, even-sized checks. This case is formed by level and vertical stripes (generally of comparative shading) that cross each other on a white establishment to outline even checks. Madras is a case that began in a city in South India, some time back known as Madras the city is by and by called as Chennai. This midyear surface style is perceived by a case of wonderful checks and stripes. The stripes of a madras check or plaid involve different tinted stripes that cross each other to outline uneven checks. Madras has transformed into a common case for shorts and agreeable shirts. The Houndstooth configuration has a similar case incorporated into the Shepherd's check and Glen plaid. The watches that make up the Houndstooth are broken/uneven and pointy-framed (like a pooch's tooth). The Houndstooth case is generally high differentiation however can be found in a variety of tones and on an arrangement of pieces of attire and ornamentation nowadays. [8][9]

You can control checked surfaces to change their appearance by using them corner to corner, mitering to the

center, or cutting them isolated to make a skirt on an arranging surface.

The examination of advanced example coordinating for misaligned creases of looked at texture virtual human work demonstrate has been talked about in this study.

II. EXPERIMENTAL

A. Developing a Human Mesh Model

The wireframe human model is produced utilizing Make Human 1.0.0 open source programming for making 3D human characters which is utilized for Real Time Simulation. This is an easy to use application which gives less demanding demonstrations in a work surface.

Table – 1: Measurement chart of Virtual Human Mesh Model

S. No	Feature	
1	Gender	Male
2	Age	20
3	Muscle	50%
4	Weight	100%
Measurements (in cm)		
1	Height	161
2	Chest	90
3	Waist	71
4	Hip	87
5	Neck Round	36
6	Neck height	10
7	Upper arm circ	25
8	Upper arm length	27
9	Nape to waist	35
10	Waist to hip	17
11	Shoulder dist	13
12	Front chest distance	30
13	Upper leg height	33
14	Thigh Circumference	50
15	Lower leg height	50
16	Calf circumference	36
17	Ankle	21

The Table 1 demonstrates the Measurement graph for the Virtual Human Mesh display. There are 17 vital estimations that are required to build the Virtual model with Make Human 1.0.0. A model for 20 year old kid was produced utilizing the standard estimation outline.

B. Checked Fabric

1. Elements of Checked Fabric Construction

The construction of any woven fabric depends upon the design, draft and the lifting plan and these are very closely dependent upon one another.

- **Design** – It denotes the interlacement of warp and weft threads in the checked fabric.
- **Draft** – Number of Heald shafts required for a given weave repeat.
- **Peg plan** – It denotes the order of lifting the Heald shaft.

In normal practice the designer has to produce a range of designs for looms with a known pattern scope. This usually involves the draft and the lifting plan construction. A similar procedure is adopted when the designer is asked to reproduce a specific design from a sample. The weave in the sample is analysed and a suitable draft and lifting plan is derived.

C. Defining the Fabric Pattern

From a visual point of view, textile fabrics differ by:

- Pattern type (single colour, striped, checked or plaid)
- Orientation (with respect to surface nap, asymmetric surface texture, etc.)

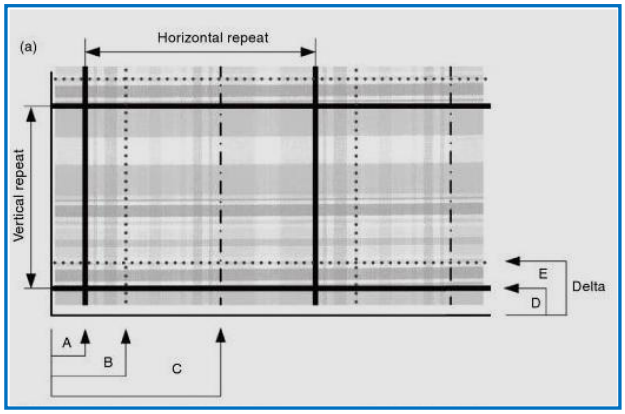

Figure – 1: Checked fabric repeat analysis

The checked fabric repeats analysis has been described in Figure 1. Pattern-repeat dimensions are defined on the basis of initial dimensions that is repeat in the horizontal and vertical directions. It is expressed in mm, while a fabric with a pattern-repeat is defined by the dimensions of the basic repeat (horizontal and vertical), with its distance from the selvedge or the edge of the fabric (delta A and D) as well as the dimensions of the auxiliary repeat (delta B, C and E)

D. Construction of Checked Fabric

While constructing a checked fabric certain important aspects like the design details, thread count in the sett, number of sett's required to produce the checked fabric, the reverse of the sett, the repeat and pivoting points of the checked pattern must be drafted carefully.

- **The Sett** – The Sett is a sequence of threads to form a series of striped effect in the checked pattern.

- **Reverse** – It is the mirror sequence of the sett.
- **Repeat** – Repeat is the duplicate of the sett in the checked pattern.
- **Pivot** - The sequence of threads, known as the sett, starts at an edge and either repeats or reverses on what are called pivot points.

E. Digital Surface Modeling

Digital Surface Modeling in textiles is the use of Computer Aided Textile Designing system to design surface patterns like plaids, checks, stripes, printed effects and texture patterns for the desired textile materials in 2D or 3D aspect. The DSM's control certain important aspects like yarn count, yarn interlacement and interloping, colour count, and technical requirements in the loom like number of Heald frames required to produce the DSM.

F. Point Paper Representation of Checked Fabric

A checked pattern is distinguished by white and colored, even-sized checks. This pattern is formed by horizontal and vertical stripes (usually of the same color) that cross each other on a white background to form even checks.

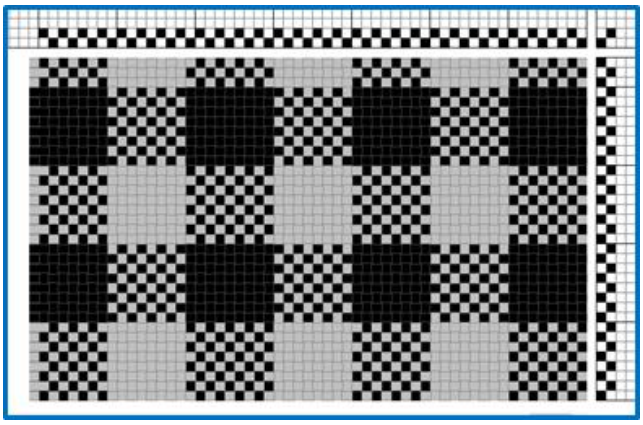

Figure – 2: Checked fabric graphical representation

The Checked fabric graphical representation and its design, draft plan, tie ups and lifting plan has been shown in Figure 2. The fabric has no right or wrong side with respect to colour.

G. Mesh Human modelling

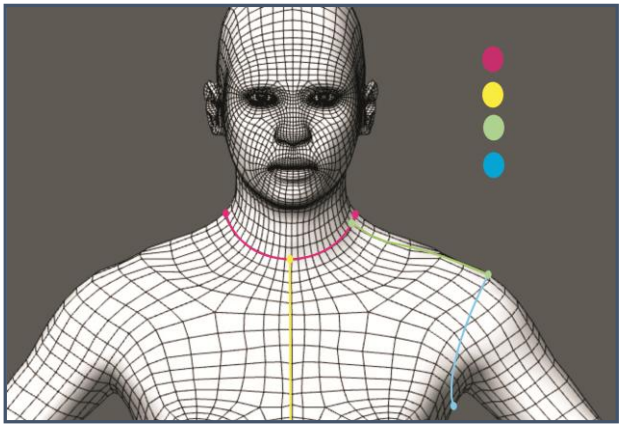

Figure – 3: Virtual human mesh model Front view

The human mesh model back view has been shown in Figure 4. The back neck line, center back line, back yokes line and back armhole line has been marked in red, yellow, blue and orange colours respectively. These are the points where the exact matching of the pattern parts is necessary at the back.

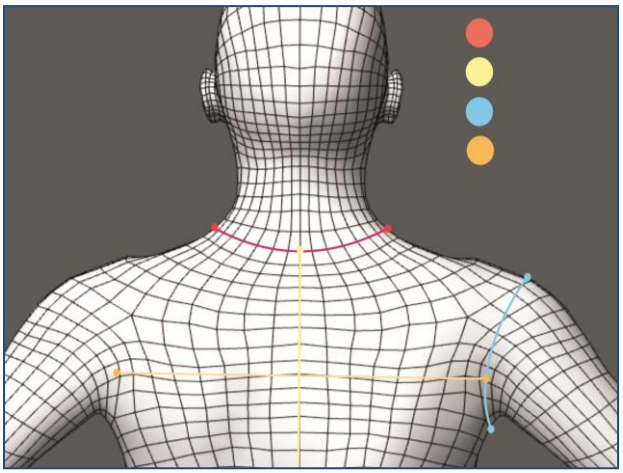

Figure – 4: Virtual human mesh model back view

The human mesh model side view has been shown in Figure 5. The back armhole line, side seam line and waistline at the side have been marked in yellow, pink and green colours respectively. These are the points where the exact matching of the pattern parts is necessary at the side.

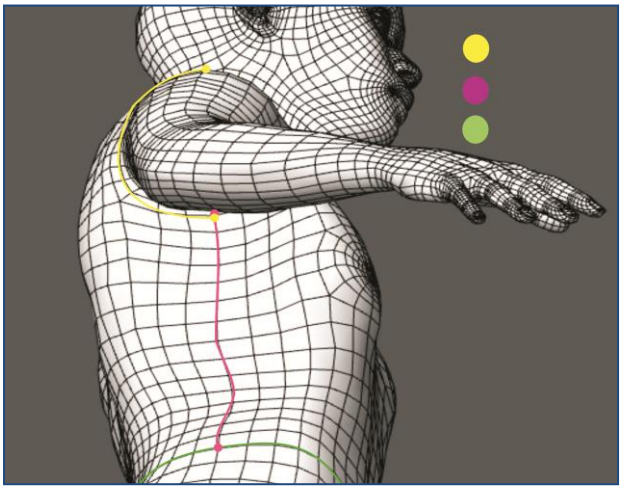

Figure – 5: Virtual human mesh model side view

III. RESULTS AND DISCUSSION

The virtual human mesh model dressed front view has been shown in Figure 6. The marked circle 1 at the shoulder shows the parts misalignment due to faulty grain line at the shoulder. The arrows at the centre front line denote that the checked pattern has been correctly aligned and matched to the right front and left front. From the diagram it's very clear that the shoulder line at the front must also be concentrated in order to match the checked garment parts accurately.

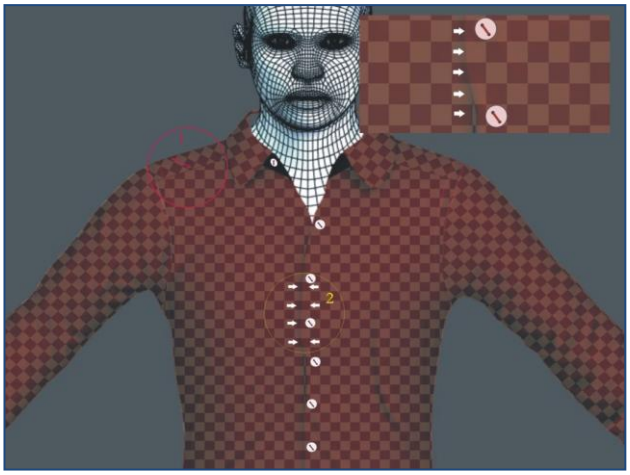

Figure – 6: Virtual human mesh model
Dressed up front view

The virtual human mesh model dressed back view has been shown in Figure 7. The marked circle 1 at and 2 shows the grain line and checked patterns at the right and left sleeves. The circle 1 in the left sleeve is marked in yellow colour since the grain line runs in the lengthwise direction exactly as desired in the pattern rules, whereas the circle 2 in the right sleeve is marked in red colour to show the misalignment of grain line and checked pattern in the sleeve due to faulty grain line.

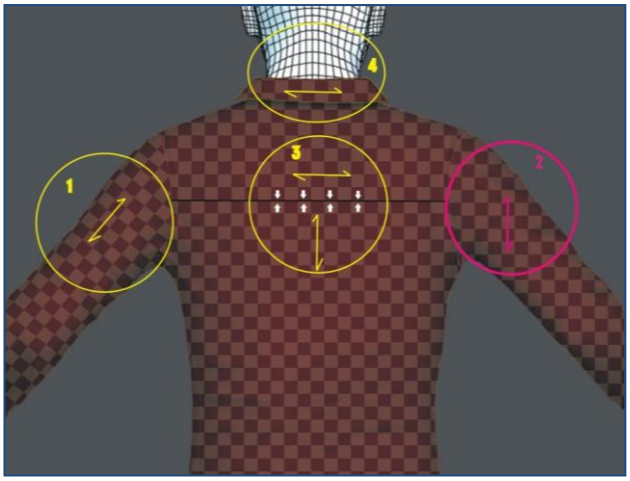

Figure – 7: Virtual human mesh model
Dressed up back view

The collar is running in the exact weft grain has been marked in circle 4. Circle 3 shows the grain lines of back part and yoke parts running exactly on lengthwise and crosswise grains and the white arrows shows the matching of the checks at the yoke seam.

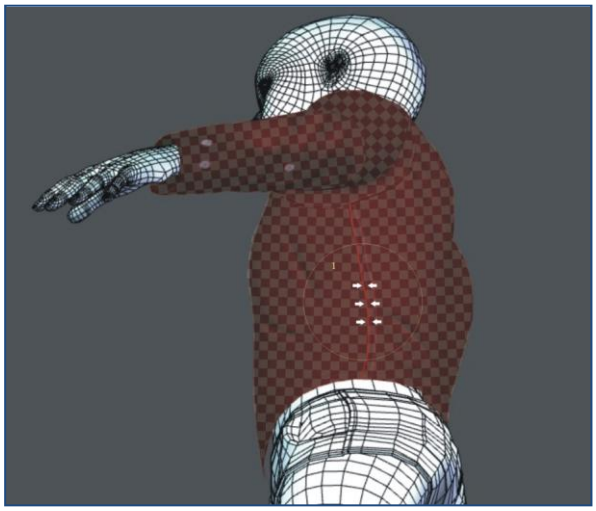

Figure – 8: Virtual human mesh model
Dressed up side view

The virtual human mesh model dressed side view has been shown in Figure 8. The circle 1 in the side seam shows the exact matching of the checks at the seam position. This has been shown with white arrows.

The examination of advanced example coordinating for misaligned creases of looked at texture virtual human work demonstrate has been talked about in this study.

IV. CONCLUSION

The study very clearly proves the significance of matching the checked pattern at the seams, edges and inseams. While designing and constructing garment for checked fabrics a lot of care has to be taken to mark patterns to the exact grain line so that the pattern matches in all the desired seams and no such misalignment or mismatching occurs especially at the seams. Digital Surface modeling over human mesh model provides a lot of solutions to these problems. This method will be very much helpful to the fashion designers, pattern engineers, teachers, students and researchers.

V. REFERENCES

[1] Coyne R, Snodgrass A, 'Rescuing CAD from rationalism', Design Studies 193; 14:100-123.

[2] Tovney M,'Intuitive and objective processes in automotive design' Design Studies 1992, 13(1): 23-41

[3] D. Terzopoulos, J. Platt, A. Barr, K. Fleischer, 'Elastically deformable models', SIGGRAPH '84, Proceedings of the 14th Annual Conference on Computer graphics and Interactive techniques, ACM press, 1987, pp 205-214.

[4] B. Allen, B. Curlens, Z Popovic, 'The space of human body shapes: Reconstruction and parameterization from range seam', ACM transactions on graphics, 2003, pp 587-594

[5] D. Baraff, A. Witkin, 'Large steps in cloth simulation ACM SIGGRAPH', 1998, pp 43-54.

[6] K.J. Choi, H.S Ko, Stable but responsive cloth, ACM SIGGRAPH 2002.

[7] Gerald Farin, 'Curves and Surfaces for Computer Aided Geometric Design, Academic Press inc, 1990 pp 32-45.

[8] Barbara Brackman,'Making History-Quilts & Fabric from 1890-1970, C & T Publishing Inc 2008.

[9] Sue Manser and Chris weaving, 'Revise for Edexcel GCSE Textile Technology, Heinemann Educational Publishers, 2003 pp 165-170.