RAE2026

Motion Pleats

Prof. HUANG Tsai-Chun

UoA38

11.2025

Contents

6. Research Methods, Prototypes & Materials)

Title: Motion Pleats

1. Descriptor

Pleating is one of the most time consuming, labour intensive and material heavy textile manipulations. However, sustainability is a crucial and pertinent issue in fashion industry these days. The researcher received General Research Fund (GRF) to conduct '*Developing sustainable pleats design and production methods through body, movement and modern dance*' (Funding amount: HKD 480,000, no. 15613223). Therefore, this research project combines digital knitting, weaving and 3D printing with pleating to examine how cutting-edge technologies bring sustainability to traditional pleat formation.

It is apparent that pleats are formed by two factors. The first one is production methods and the second is patterns. Over the last decade, a common question in pleating practice is if the pattern is brand new. Unlike prior methods that directly visualize motion trajectories, this study employs a hybrid approach combining mathematical computations, 2D graphing, and 3D modeling. Utilizing data from a Vicon motion capture system, the research converts dance movements into sculptural forms through Euclidean Distance formula, showcasing how these dynamics can inspire design.

This research provided three approaches for new pattern generation. The approach 1 is Woven Pleats with continuous stop-motion images from Vicon motion capture. The 2nd approach is Digital Knitting which adopts Riho3D to divide the form made by Euclidean Distance formula. The approach 3 uses 3D printing to print the new folding structure breaks down by software Pepakura Designer.

To conclude, this GRF-supported research project investigates the possibility of generating new folding patterns via body motion, and the patterns are used for sustainable pleating production through digital knitting, weaving and 3D printing. This research outcome is in the form of one journal paper, one conference paper, three conference presentations and four design collections. The dissemination would be at five exhibitions: Beijing, Hong Kong, Venice, Sicily and Paris.

2. Researcher Profile

Dr. Tsai-Chun Huang joined The Hong Kong Polytechnic University in 2020 after acquiring his Ph.D. from the Royal College of Art, London. Currently, he is an assistant professor in the School of Fashion and Textiles, Hong Kong. His research focuses on the history of pleats and innovation in pleating technology.

He learned the technique of traditional hand pleating at Ciment Pleating Ltd. in the UK and invented Innovative Pleating Method, which has been demonstrated in several design schools, including Fashion Institute of Technology (FIT), Parsons School of Design, New York University (NYU), Royal College of Art (RCA) and Istituto Marangoni, London. His work has been selected and exhibited in the 5th and 6th Art and Science International Exhibition and Symposium by Tsinghua University in National Museum of China, Beijing and The APPA Museum, Palermo, Sicily, Italy.

After joining Hong Kong Polytechnic University, his research expanded to become more movement oriented and focused more on the design of sports wear/activewear In 2023, following his grant approval, he researched how modern dance movement can inspire new pleating patters.

He was invited to work with European art festivals to demonstrate his pleating artworks, such as at the Venice Biennale Architecture 2025, the Prague Quadrennial 2019 and Hull UK City of Culture 2017. His latest activewear collection, Style in Motion, exhibited in Paris in 2024, won the Red Dot Award Design Concept 2025 for High Design Quality, Gold prize in International Design Award, London Design Award and French Fashion Award.

3. Research Questions

This research focuses on using modern dance as data source, creating new methodology for generating novel pleating patterns.

After the literature review, there are three research questions need to be answer.

1. **What are the textile manipulation techniques to formulate new type of pleating patterns into tangible form which is not affected by heat and humidity as conventional heat set pleats?**
2. **Is modern technology the answer to sustainability in pleating?**
3. **How to collect the motion data from modern dance and convert the motion data into visual material for potential pleating patterns?**

4. Research Output

Journal Paper

1. Huang, T. C., Jin, M., & Lin, M. (2024). Innovating sustainable fashion design: an exploration of the sustainability of a hybrid method through the C2CAD framework. International Journal of Fashion Design, Technology and Education, 1–11. https://doi.org/10.1080/17543266.2024.2436093

Conference Presentation

2. Huang, T., & Liu, S. (2025). Application of self-pleating knitted structures in gym wear back zoning design. ICTEAA 2025: XIX. International Conference of Textile Engineering and Applied Arts, Dubai.
3. Innovating sustainable fashion design: an exploration of the sustainability of a hybrid method through the C2CAD framework, 2024 Global Fashion Management Conference at Milan, 2024

Conference Paper

4. Huang, T.C., & Gao, W. (2025). CLIP the Form: A Human-AI Interaction Framework for Retrieving 3D Structural Forms from Textual Prompts. International Association of Societies of Design Research Congress 2025, Design Next, Taipei.

Design Collections

5. Hong Kong Jade Walking (2025)
6. Fluer de la paix (2024)
7. Style in Motion (2024) https://www.huangtsaichun.com/style-in-motion
8. Pat Ka Chiòng (2023) https://www.huangtsaichun.com/pakachiong

5. Research Field & Key References

There are three key elements in this study: pleats, motion and sustainability. In literature, several cases elaborate how these three fields integrate with each other, and the review here offers research potential for this study. Therefore, the discussions are: Fashion & Sustainability, Pleats & Technology and Pleats & Dance.

- **Fashion & Sustainability**: Awareness in the fashion industry ensured sustainability for quite some time. Particularly in Hong Kong, there are some initiatives that try to tackle the issue, for example, Garment 2 Garment and Vcycle. Garment 2 Garment reinvents the conventional recycling method by shredding the garments and respinning the fibre into yarns for knitting into a new garment without a drop of water. Vcycle turns plastic bottle wastes into 100% polyester garments. This research, however, addresses the sustainability problem from the production aspect instead of recycling used garments for reproduction.
- **Pleats & Technology**: Technological evolution is a key concern of this research, given that one aim of this project is to create new forms of pleats and pleating. In 2015, Christophe Guberan collaborated with Carlo Clopath and Self-Assembly Lab, MIT to create a self-contracted shoe upper with stretched knitted textiles. By printing plastic alongside the folding lines when the fabric is stretched, the textile contracts according to the folding structures when it is released, creating a 3D form naturally. Dr. Berit Greinke worked with a UK-based design studio, Pinaki Studio, to laminate a conductive material on the surface of pleats. When the natural movement of contraction and expansion is activated, the conductive surfaces of the pleats touch each other with current passing through, creating a sound effect according to the programmed codes.
- **Pleats & Dance**: Mariano Fortuny (1871–1949) examined the dancers' movement carefully to provide a costume that would allow full mobility for the performers; in the East, Issey Miyake (1938–2022) considered the suggestion of a friend that the Pleats Please garments might look interesting on dancers (Metropolis, 2016). Therefore, before the launch of Pleats Please in 1993, William Forsythe (1955-) proposed a collaboration on The Loss of Small Detail.

6. Research Methods, Prototypes & Materials (Precursor Research 2017–2019)

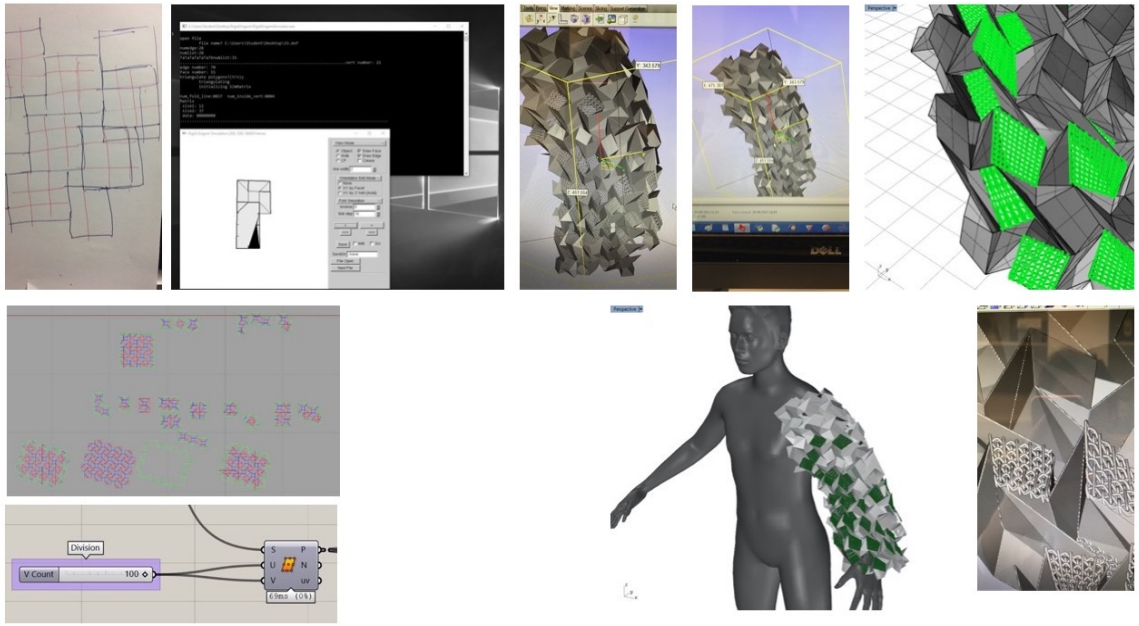
Farewell My Concubine

The Beijing Opera, *Farewell My Concubine,* costume redesign adopted powdered-based thermoplastic polyurethane SLS 3D printing.

The intricate 3D-printed geometries were created from an algorithm-based parametric programme (Rigid Origami and Freeform Origami) and transferred into the 3D model in Rhinoceros 3D (Rhino 3D) modelling software.

After the pleating structure is created, the garments are designed by creating parametric algorithms to translate several pleating structures that can be applied to print the clothing.

Performers shared that they needed some time to become accustomed to the costumes, music and stage when the new aesthetics were introduced (Petch, 2017). The 3D printed garments did not hinder how the audience perceived the emotions the performers generated. This research follows this pilot production as a role model to continue to explore pleats in different forms.



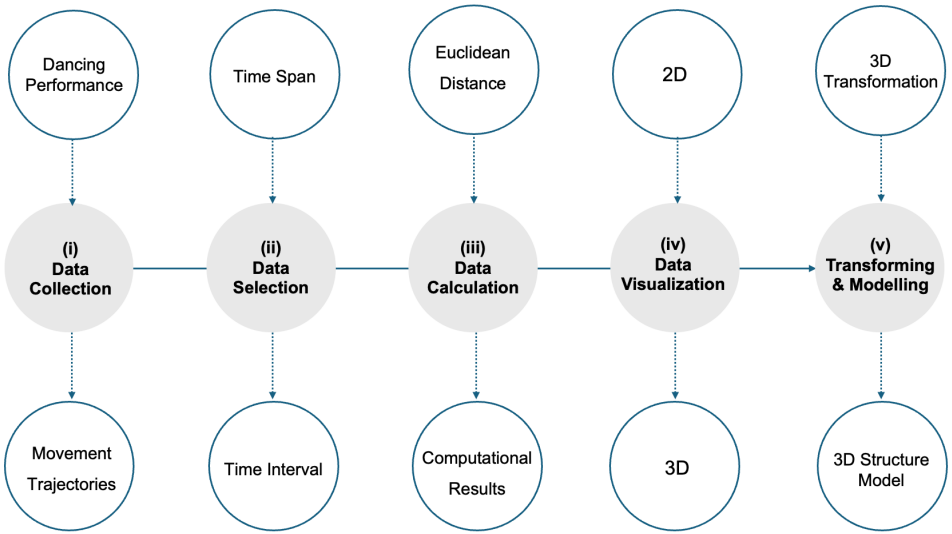
Royal College of Art (2017)

7. Research Methodology

Different from *Farewell My Concubine,* the *Motion Pleats* project begins with the dance performance to generate data.

The research design is set in five stages. A dancer is invited to perform a flow of motion with the documentation of its trajectory. The data from the motion undergoes a formulation filtering process for 2D and 3D visualisation. The final 3D form is further processed to become pleating patterns for textile manufacturing.

The entire preparation included the arrangement of detectors, detection area, the dancer and markers. The dancer's motions were documented using a motion recording system powered by VICON V5 Highspeed 3D Motion Capture Camera. To fully cover the detection area, eight calibrated cameras were arranged in a testing room. In the room, the detection area was set up with a 2500 mm width and a 3500 mm length, and the dancer had to perform in this limited area.



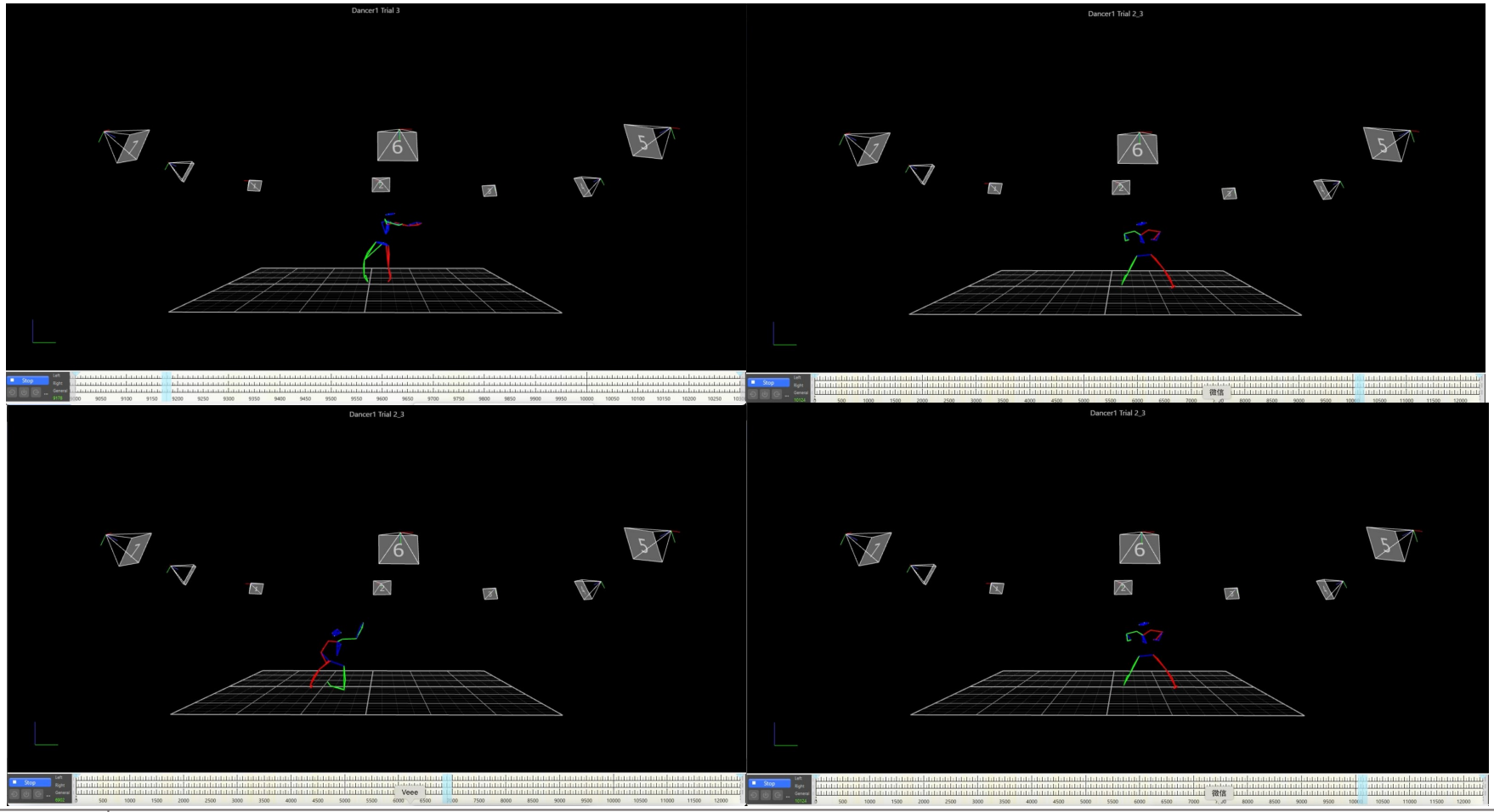
8. Research Methods, Prototypes & Materials

As for the dancers, a Plug-in Gait (PiG) biomechanical model was established for the dancer based on their anthropometric parameters in the Vicon software. Vicon's PiG model is a digital implementation of the Conventional Gait Model, offering complete body kinematics and modelling (VICON, 2024).

In this project, the modelling data from Vicon will be applied for visualisation progress. The dancer was equipped with a total of 39 reflective markers taped on the body from head to toe, and the layout followed the PiG Full Body model specification suggested in the Vicon PiG instrument.

8. Research Methods, Prototypes & Materials

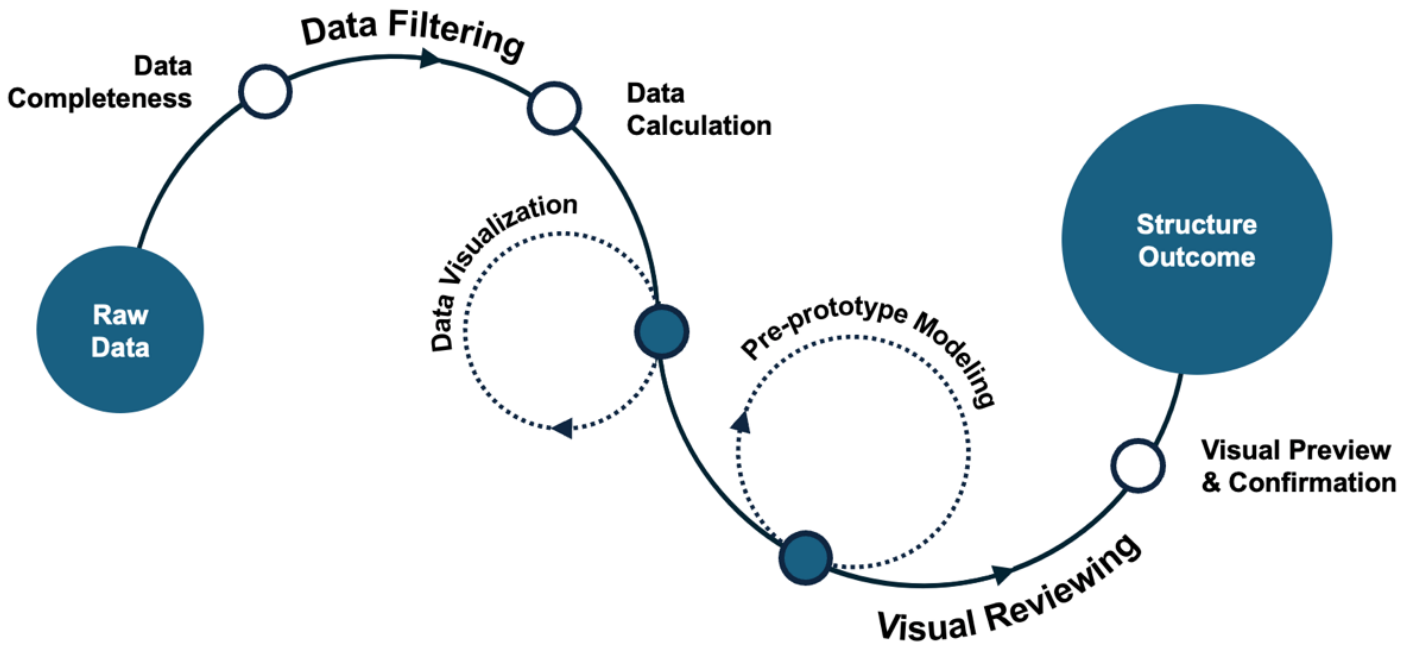
After that, the motion recording continually documented the dance movement from the beginning to the end, with data from reflective markers captured by the Vicon cameras. During this time, the dancer was required to perform the dance in three minutes, and the entire dynamic process was recorded. Then, the captured three-dimensional positional data and the moving tracks were automatically generated, and the data were identified as raw data for this study.



8. Research Methods, Prototypes & Materials

The trajectory did not reveal sufficient information to build folding patterns, the research design has changed.

The process of multiple selection was carried out because of the huge amount of data in the raw data pool; the procedure is illustrated in Figure 4. This approach was necessary to organise the data efficiently and categorise it into smaller datasets. Besides, the datasets were selected from a more complete dataset because during the dance performance, some markers could not be detected due to some postures where limbs of the body may have obscured them. The final selected sample data was filtered by two key factors: time span and interval.



8. Research Methods, Prototypes & Materials

Data Calculation

This stage involves a computational procedure to determine the variations in distance between two body nodes. In this phase, the captured motion data was expressed by 3D coordinates (x, y, z) in a Cartesian system, with positions recorded in millimetres. The dataset covered the time frame from 5020 to 5520 (0.1 Second) and initially included 39 markers. However, due to missing data, 3 markers were excluded, leaving 36 markers for analysis, which were later reduced further to 34 for consistency. The distance variations were calculated based on the positional changes of these markers over time. For instance, Table 1 provides an example using two-head markers, Left Front Head (LFHD) and Right Front Head (RFHD), demonstrating how their coordinates were used to compute spatial differences.

Frame	LFHD			RFHD		
Axis ()	X	Y	Z	X	Y	Z
5020	490.62	1150.75	1170.52	378.19	1042.03	1226.34
5120	17.18	158.13	1431.22	120.85	287.54	1442.92
5220	119.04	186.65	1572.13	268.26	260.95	1560.52
5320	174.42	165.81	1532.71	63.48	282.70	1494.09
5420	35.33	-215.93	1450.62	-65.26	-84.51	1451.32
5520	-119.05	252.51	1635.00	-114.79	87.45	1632.28

Table 1. The Captured Motion Data (Unit: mm)

8. Research Methods, Prototypes & Materials

To identify the distances between the clavicle (CLAV), defined as the centre point, and the above selected sample points second by second, Euclidean Distance was used to calculate the distance between two points in a 3D space, as shown below:

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2 + (z_2 - z_1)^2}$$

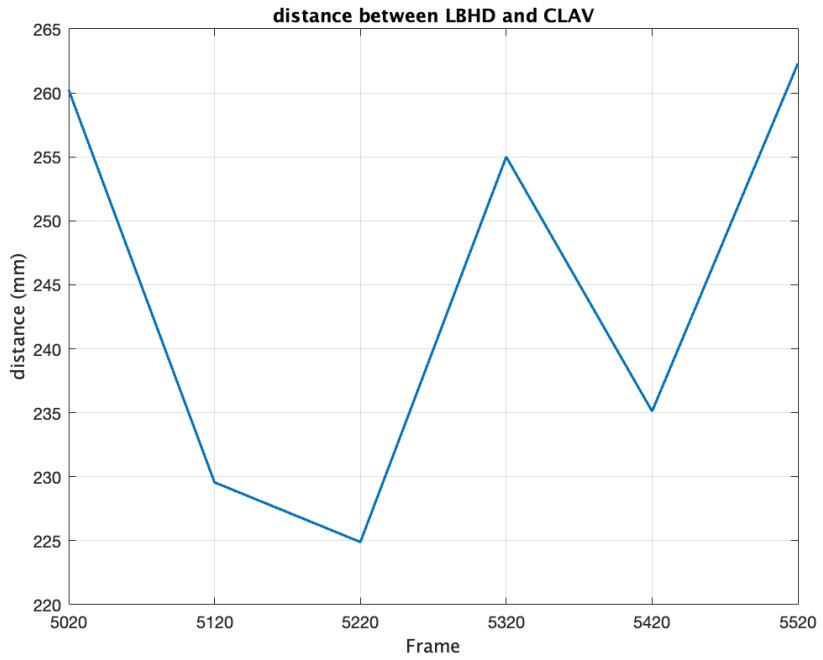
Time Frame	LFHD	RFHD	RSHO	RELB	RWRB	RFIN	T10
5020	275.03	269.17	161.33	403.61	448.77	411.65	299.12
5120	212.24	239.20	189.57	423.73	368.71	369.49	289.75
5220	243.70	268.93	183.24	432.95	400.37	364.07	292.52
5320	252.94	213.90	192.37	405.48	329.53	326.10	286.51
5420	237.23	237.93	171.72	363.42	387.11	370.59	310.71
5520	285.48	282.86	157.76	257.21	271.47	331.03	290.78

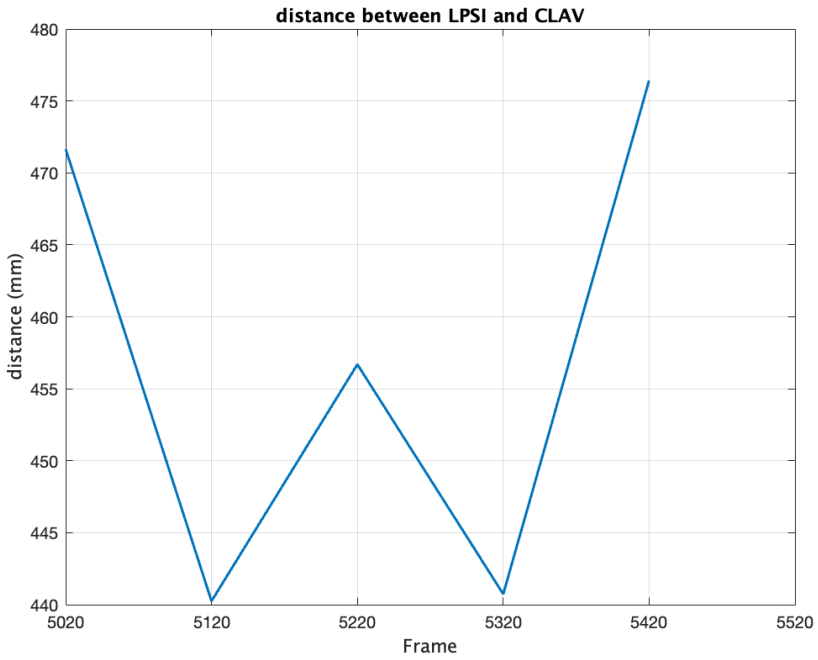
Table 2. The Result of Data Calculation (Unit: mm)
Note: The example markers in the table represent a part of the data.

8. Data Visualisation in 2D and 3D

2D

Following the computational procedure, the mathematical outputs were transformed into 2D graphical representations for analysis. The statistical data were visualized as line charts using MATLAB, generating a total of 39 plots to depict distance variations over the selected time interval. Each plot clearly illustrates the dynamic shifts in spatial separation between markers. As demonstrated in the figures below, the X-axis corresponds to the time frame, while the Y-axis quantifies the distance in millimetres (mm), providing an interpretable visualisation of motion dynamics.

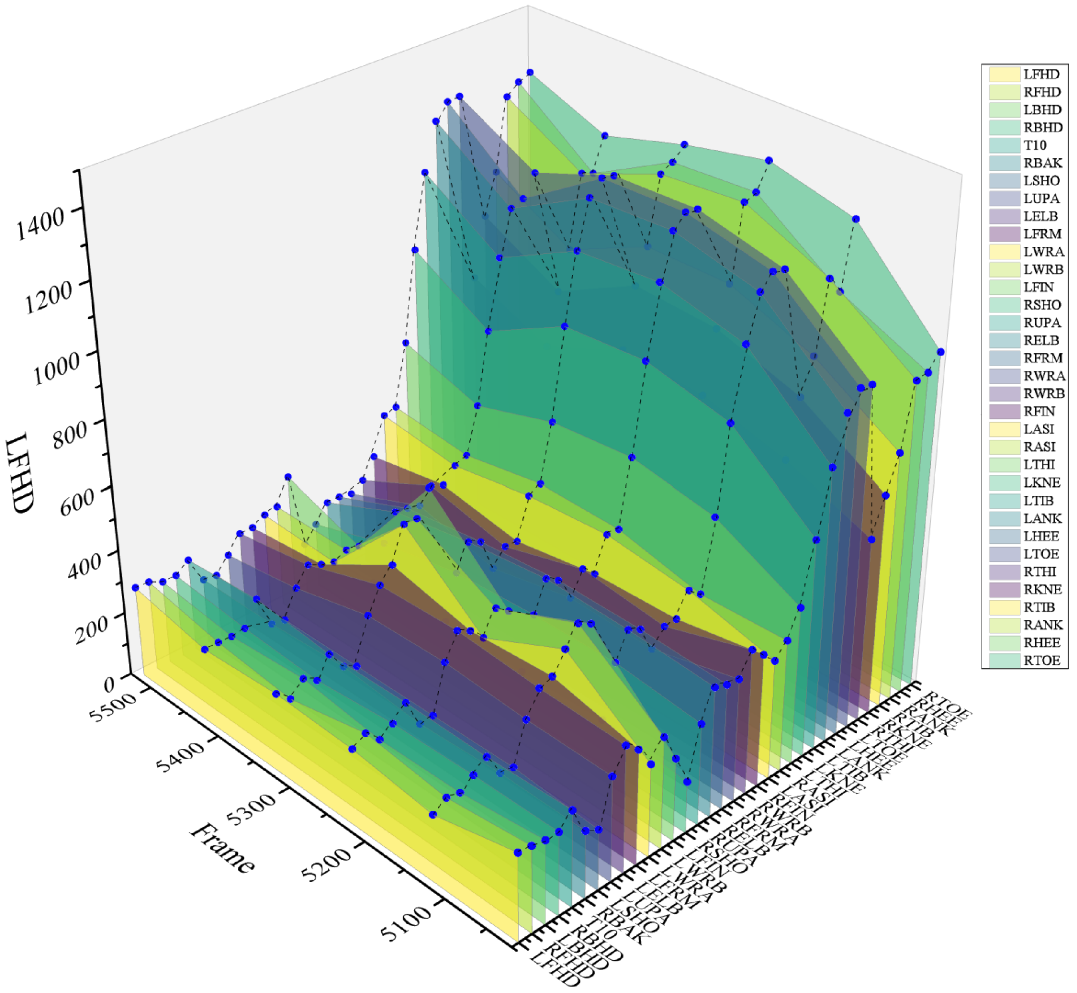




Data Visualisation in 2D and 3D

3D

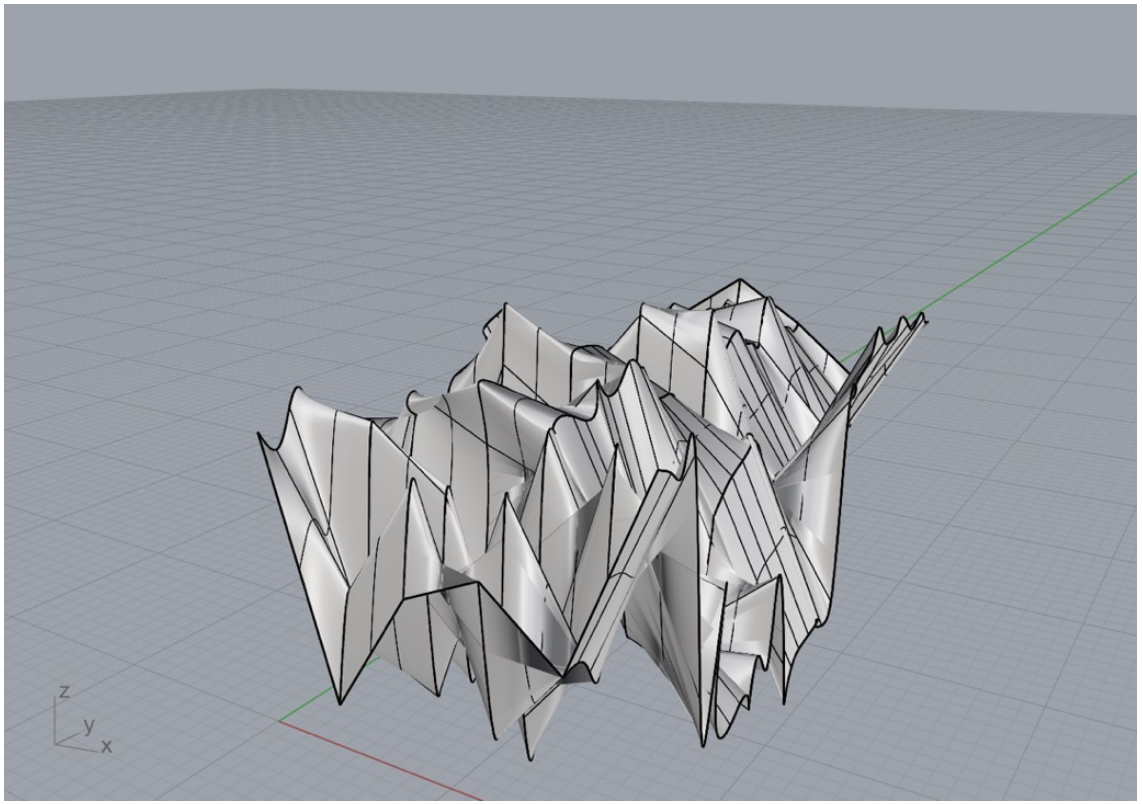
A 3D representation was created by combining the 39 trend lines that were derived from the computational study. This 3D representation was created as a waterfall plot with OriginLab, a specialized software for proficient graphing and data processing. Within this visualisation, the X-axis displays the 39 selected markers, the Y-axis represents the time frame and the Z-axis quantifies the computed distance between the CLAV (clavicle marker) and all other markers across the specified time interval (5020 to 5520 time frame). The spatial arrangement of data points adheres to the default sequence exported by the Vicon motion capture system, ensuring consistency with the original dataset. This multidimensional approach facilitates a comprehensive understanding of dynamic distance variations, enabling a more detailed interplay of markers' movement over time.



Research Methods, Prototypes & Materials

Transforming and Modelling

At this stage, the 3D chart was transformed into a visual structure using 3D modelling techniques with Rhino 8, a 3D modelling software. To create the 3D model, the curves in Figure 6, with respect to time frame, were traced and imported into the software. The traced curves were arranged with equal spacing and subsequently enveloped by a surface. To create the enveloped surface, the Loft command was used in the software, which fitted and formed a top structure. This operation produced an undulating, terrain-like structure, where surface deformations directly correspond to motion trajectories. The resulting figure serves as a significant research output, providing an innovative spatial interpretation of the dancer's motion patterns. Unlike conventional 2D plots, this visualisation captures the cumulative effect of bodily displacements across time, with peaks and valleys representing extremes in marker separation.



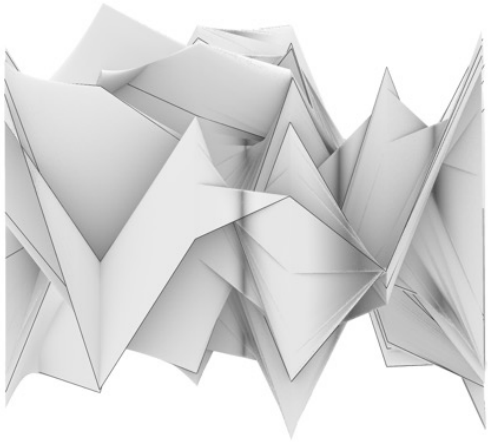
8. Research Methods, Prototypes & Materials

Data-Oriented Movement Design Methodology

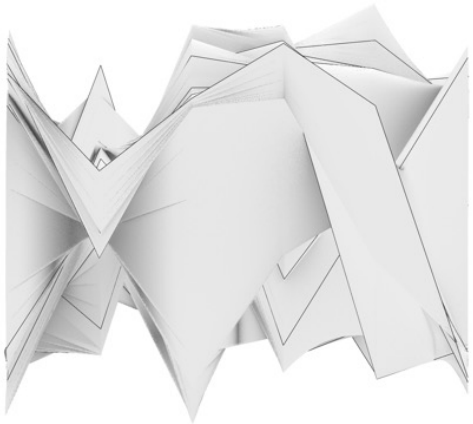
At this stage, the research establishes a new methodology for body movement-oriented design through data visualisation to illustrate the human motion trajectory in dancing. In the overall design process, an initial mathematical process is conducted by using the mathematical formula to compute the recorded data of motion trajectory coordinates on the x, y and z axes. The numerical results are then transformed into visual curves in a 2D visualisation technique after data calculation. Here, Euclidean Distance was used for calculation, and the research relied on a single formula and two points in measurement each time. This allows a great amount of data to be exploited and generates many different computational results for a more diverse visualisation output. Then, a 2D-to-3D modelling procedure is carried out once the curves are aligned, and the 2D curve definitions are constructed and linked to create a 3D model with a mountain-like surface. This study applied a unique mix of data calculation and visualisation techniques, leading to a completely distinctive representation of the motion data. The finding demonstrates the artistic possibility that the different approaches may result in distinguished visual effects for design.

8. Research Methods, Prototypes & Materials

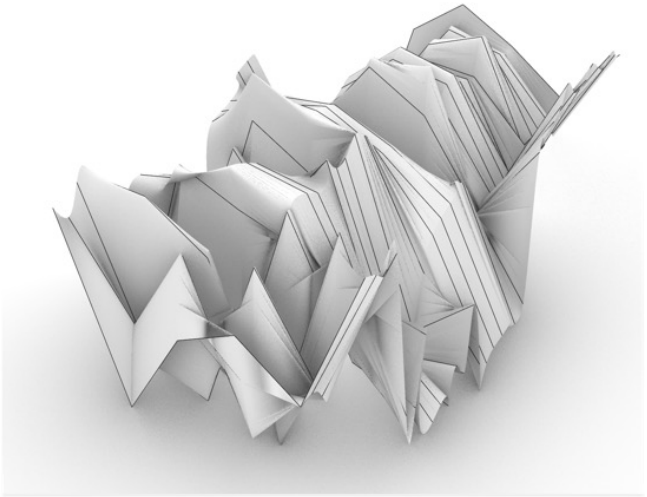
These figures display the generated model as the study outcome in front, back and perspective views. Using mathematical and visualisation techniques, it presents the dance motion in a completely different form. From data processing to visual modelling, the entire design process consists of combined mathematical and artistic design thinking and methods. This finding provides a novel idea of the use of motion trajectory data, contributing to diversifying the design. It not only validates the feasibility and adaptability of the established design methodology but also exhibits the massive creative and diverse potential of cross-disciplinary knowledge in visual design.



Front view



Back view

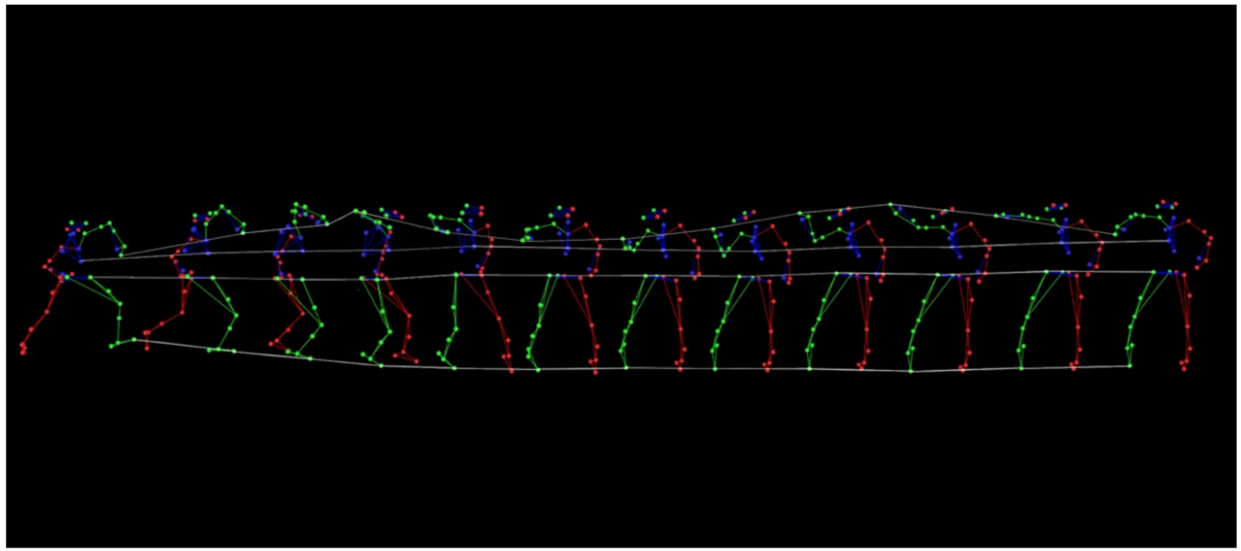


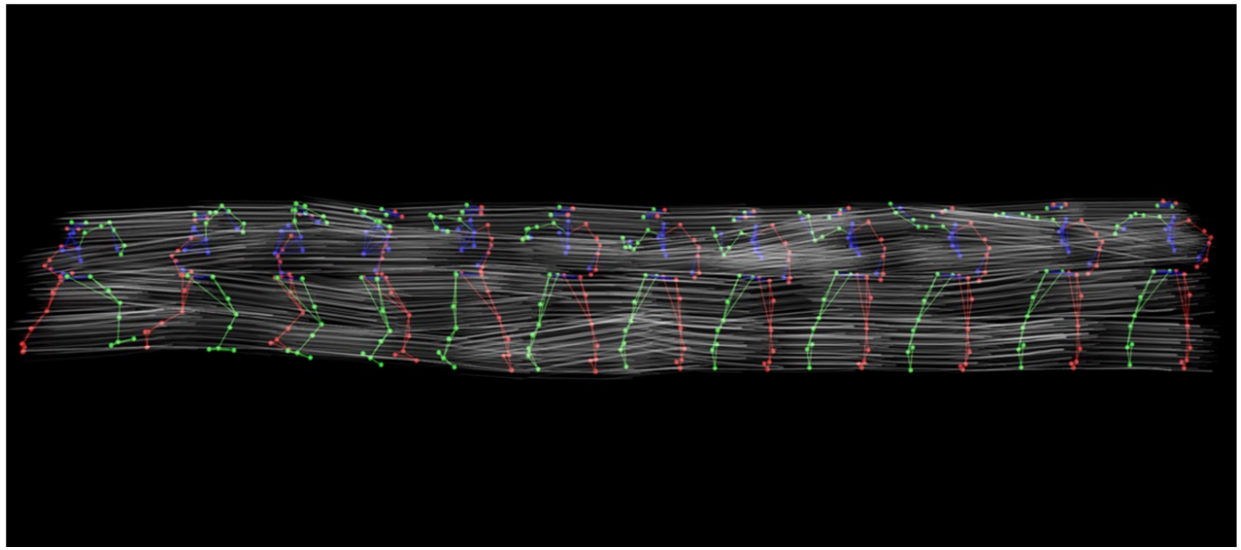
Perspective view

Approach 1

After the documentation from Vicon, 12 frames were selected, and the marking points were connected to illustrate the trajectory of each points.

As mentioned in the literature review, earlier studies have created the movement design by directly linking the motion trajectories together in a stop-motion image. Referring to the existing conversion approach, a similar attempt was conducted. These two figures present a stop-motion visualisation employing the data from this research. The image was developed by connecting the motion trajectories captured in each frame. The first image, created by linking joint points, exhibits a more mechanical representation, while the second image, generated by connecting the limbs, demonstrates a more artistic visual effect. This direct visualisation method shows the possibility of transferring these lines into mountain and valley folds which can lead to pleating patterns.

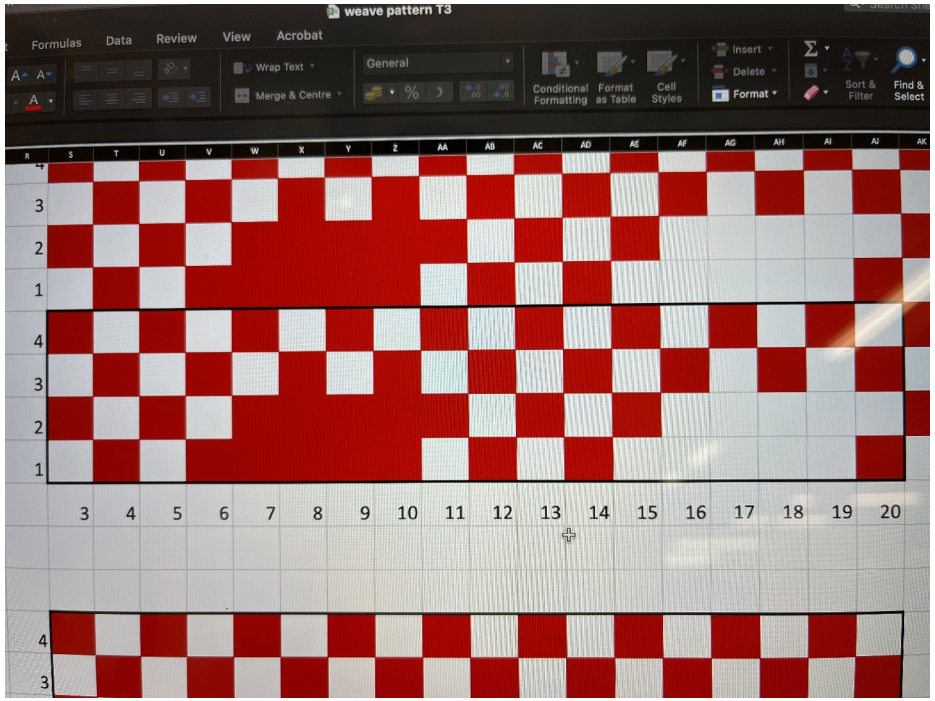


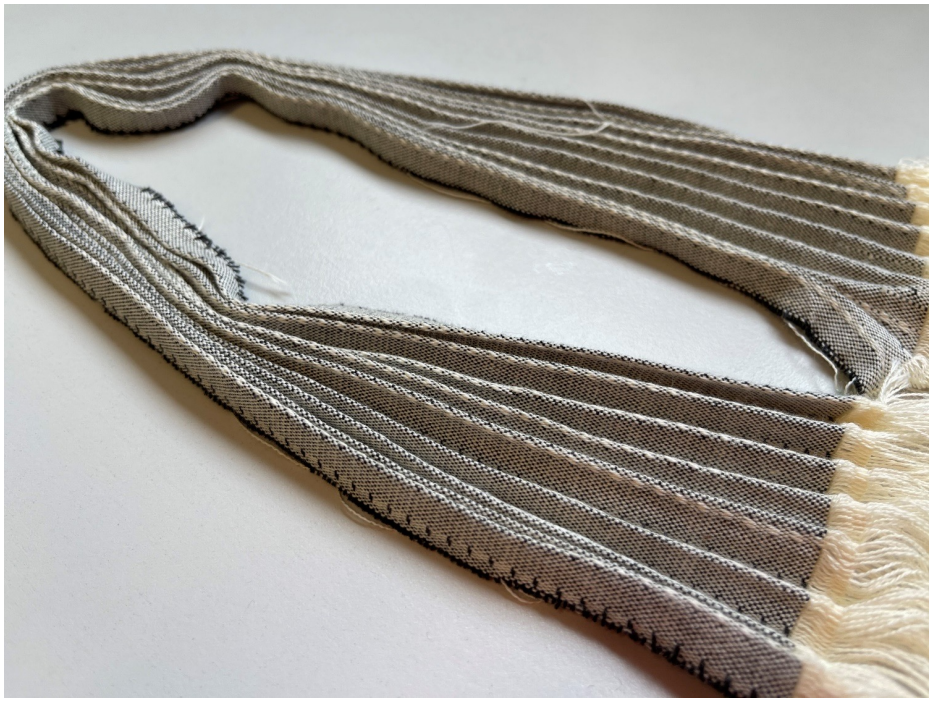


Woven Pleats from Approach 1

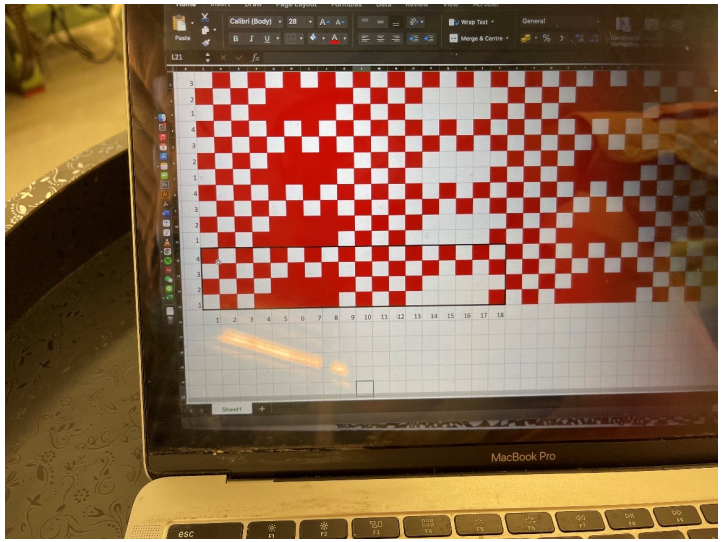
From Approach 1, the linear lines are formed according to the accordion pleats.

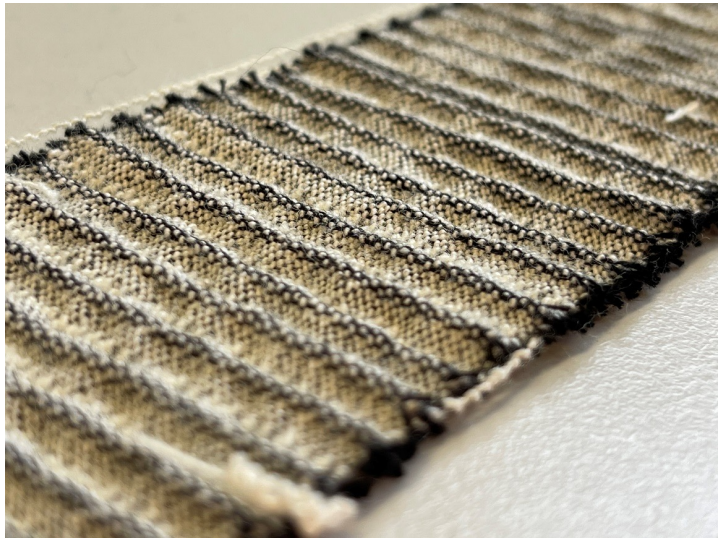
The research team adopted a woven structure to create permanent pleats for sustainability testing. The folding pattern in this experiment is a 1×1 plain weave, with density 40 psi (per square inch) at an interval of 4 polyester wefts. This sample requires a manual heat set process.



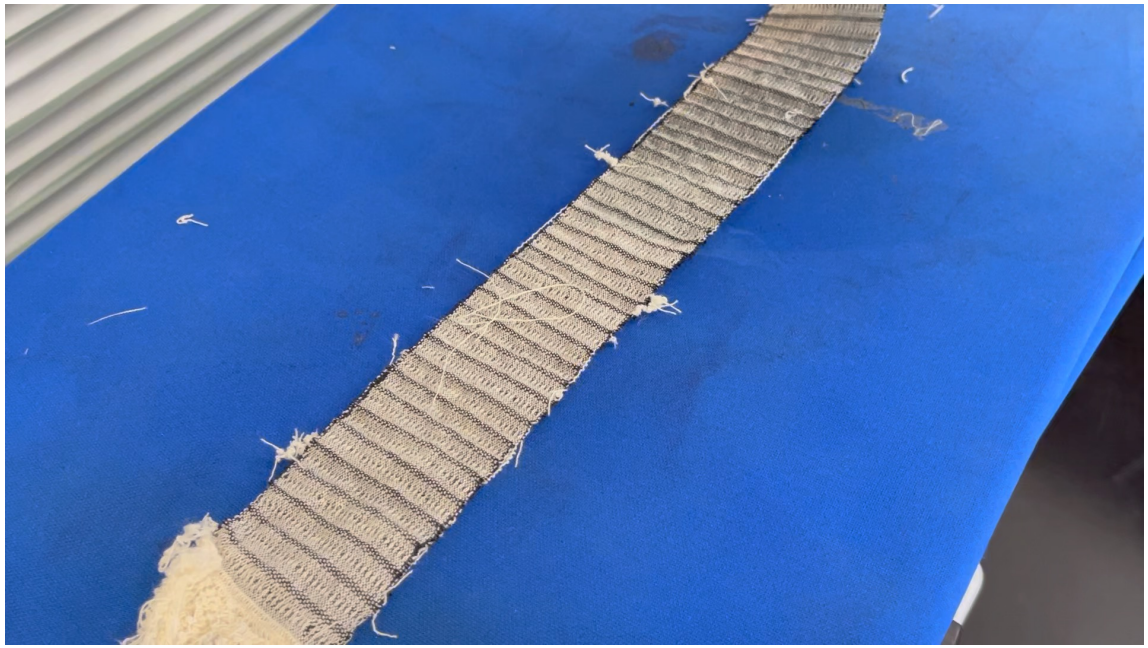


Woven Pleats from Approach 1





The second experiment is also a 1×1, density 60 psi, plain weave structure with high twist yarns at an interval of 4 warps. The high twist polyester yarns responded to the steam, and contract when heat is applied, causing the textile to shrink according to the woven pattern. The textile swatch showed a small curvy structure on the surface. It is apparent that these two tests are both straight line, knife pleats.

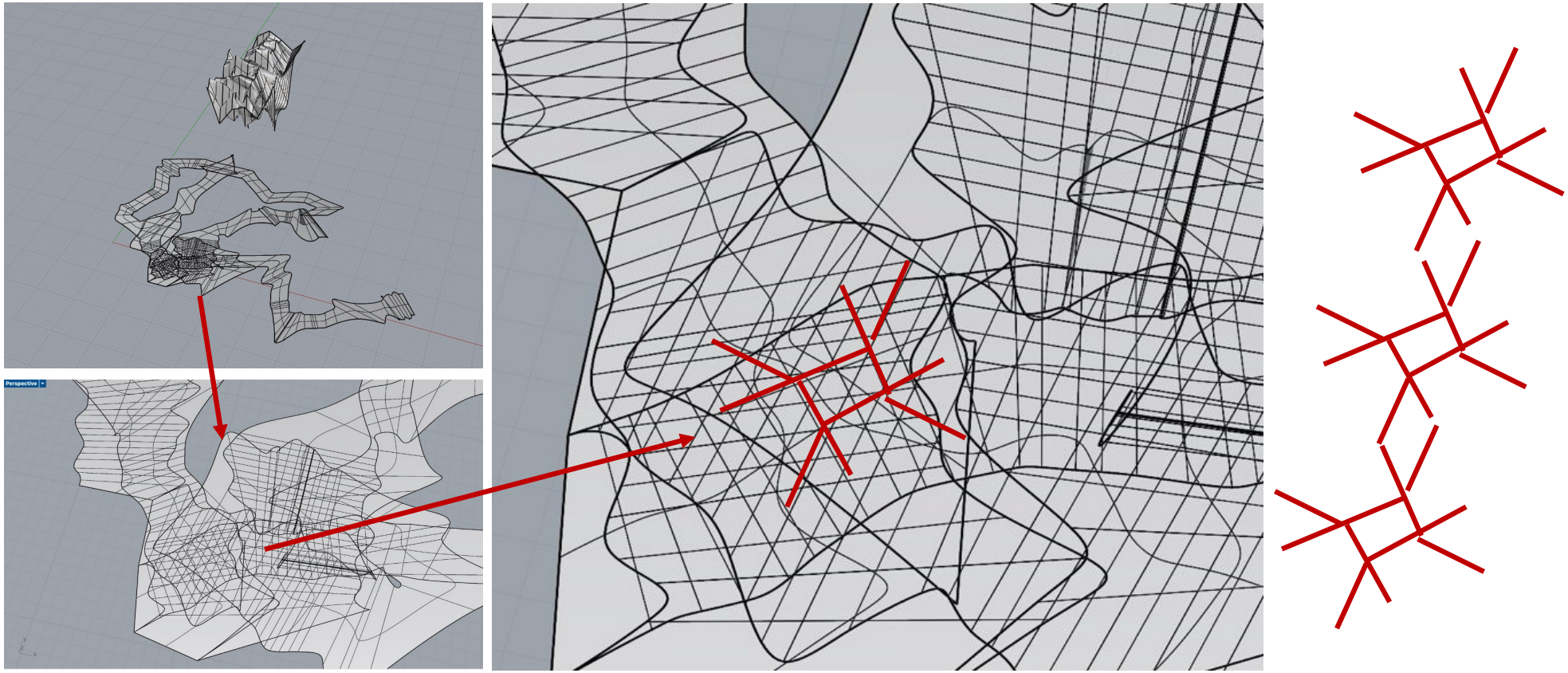


Approach 2

The 2nd approach to breakdown the form uses Riho3D v.8. First, the research team observed the form and sliced it following the long edge direction.

The form was divided into five parts according to the long edge of the form. Next, one end of all pieces overlapped to create complex intersection patterns. The team selected a particular area to become a single unit, which is the foundation for the next stage.

The team duplicated the single unit to create a continuous, repetitive pattern for pleating.



Digital Knitting from Approach 2

Digital Knitting Procedure

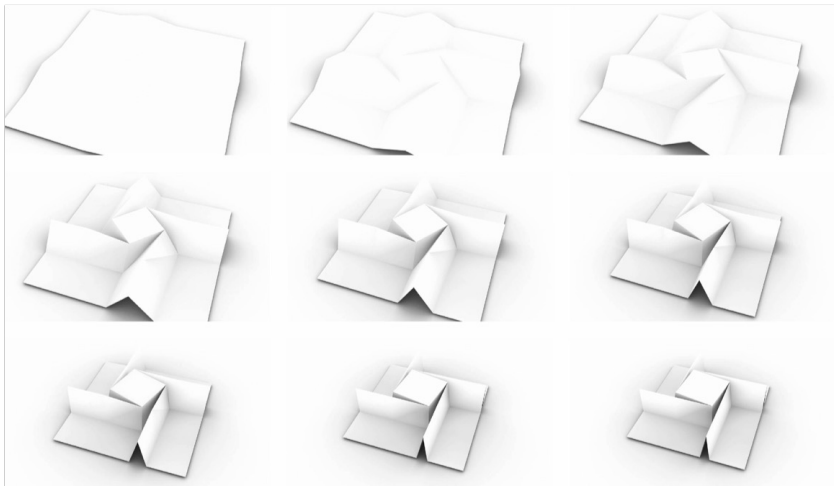
Following the previous study of adopting motion trajectory into the folding structure, this research realises the pattern using digital knitting, weaving and 3D printing to demonstrate how technology can create new folding structures.

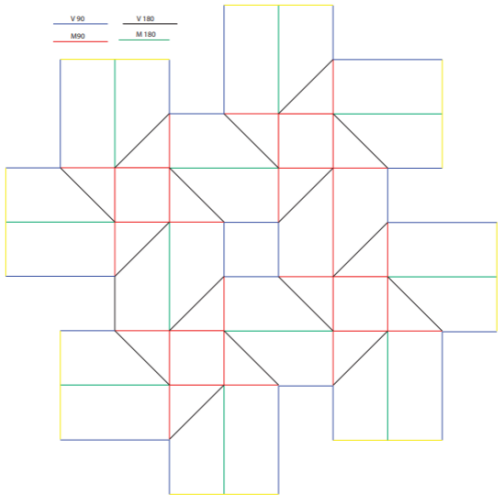
Currently, there are more and more knitted pleats in the market which form the effect through structure instead of post processing. However, the pattern is merely a straight-line fold, which is commonly known as a knife pleat. This study aims to investigate more complex origami patterns than just knife pleats; this would mainly be cubic pattern, which has been developed since 2012. Furthermore, based on the successful experience of knitting complex patterns, this study expands the territory of knitted pleats to woven pleats.

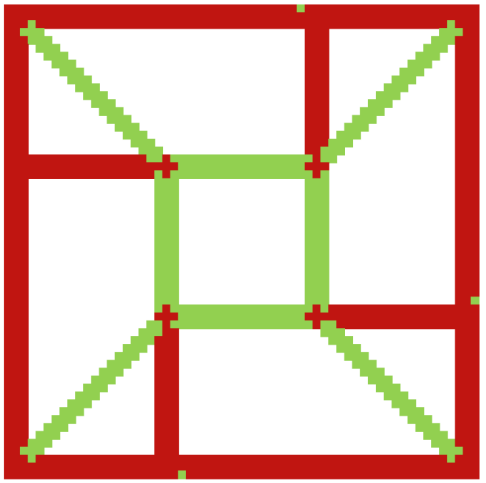
8. Research Methods, Prototypes & Materials

Cubic Pattern Testing

This research adopted the cubic pattern derived from the distance of the tracking points on the dancer's body, which provides a wide range of contraction and expansion for movement. After analysing the folding pattern, this structure was translated into a one-unit knitting pattern for a Shima Seiki SES122-S 12-gauge machine.







A folding structure is created by making three front-knit stitches in red as mountain folds and three back-knit stitches in green as valley folds. The diagonal lines are back-knit stitches as they are valley folds. The cube is formed by 16 warp stitches and 16 weft stitches. This study used 2/40 100% wool and 280/40/40 high elastic yarn with a tension of 36 psi to experiment structural pleats.

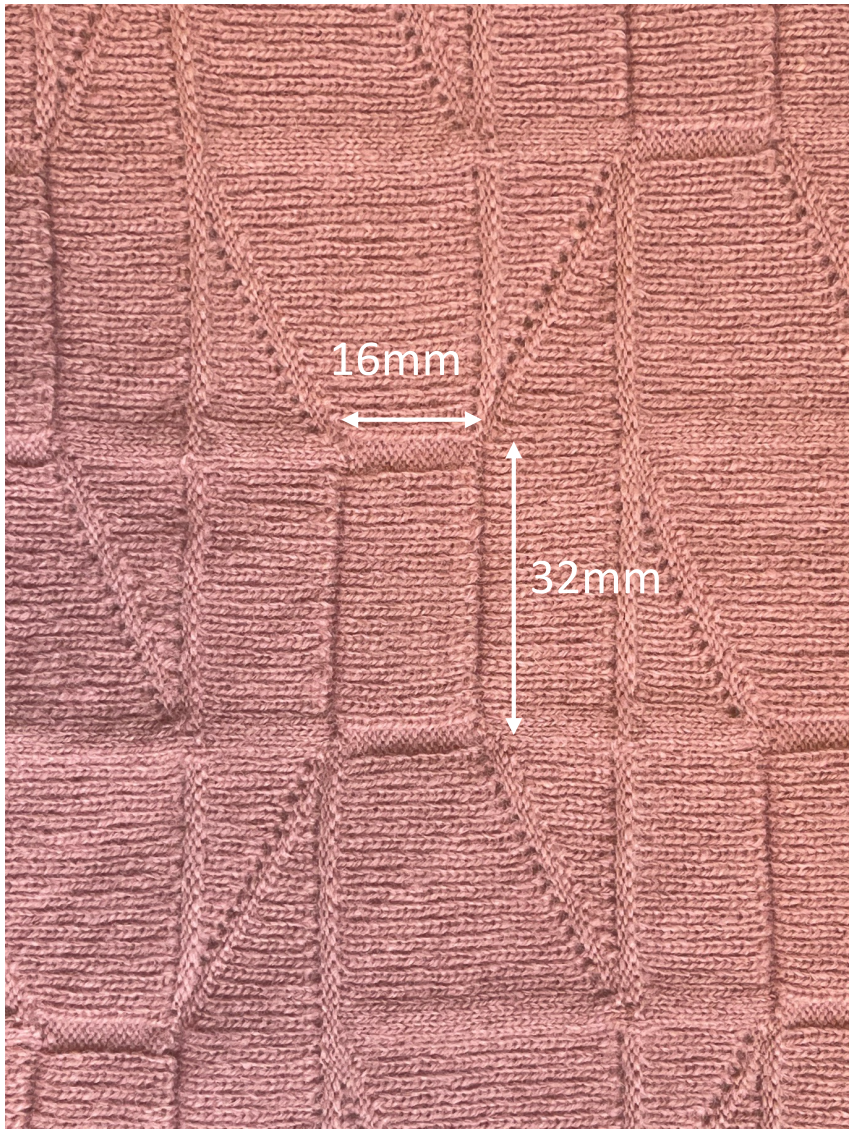
8. Research Methods, Prototypes & Materials

When the paper pattern is translated into the knitting plan, the length of the cube is not the same in knitting. Sixteen single jersey stitches are roughly 16 mm, whereas 16 lines of single jersey stitches are 32 mm (Fig. 15). Through calculation, the proportion of the length of breadth is

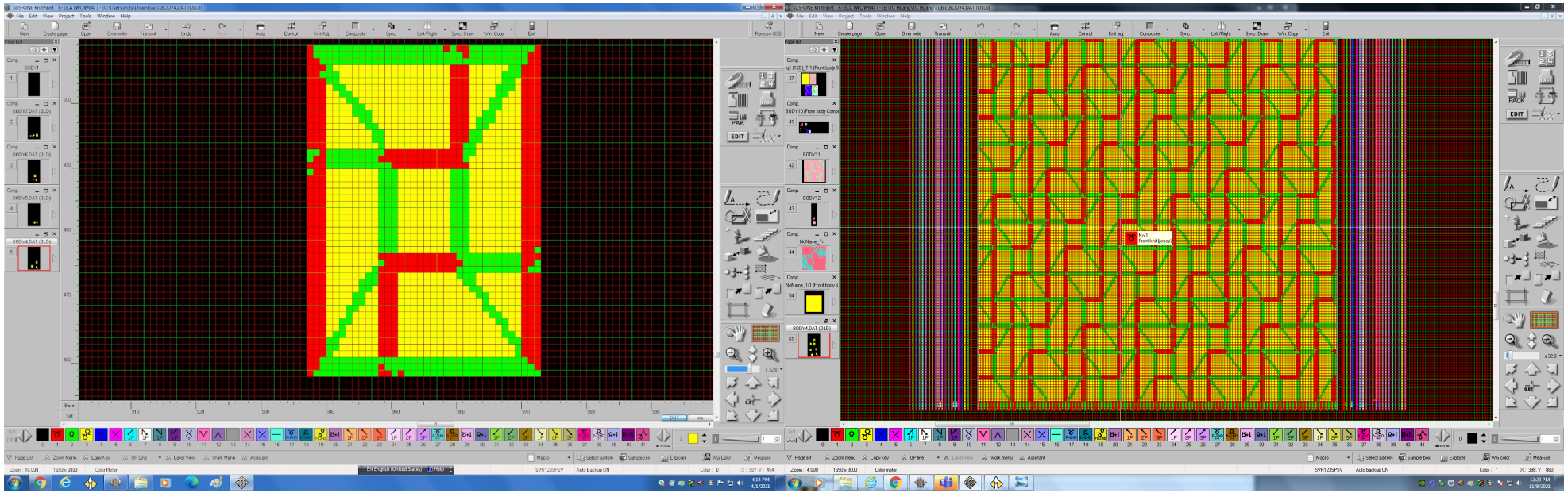
Length (16 stitches): breadth (16 lines) = 26 mm: 16 mm = 13: 8.

Therefore, the number of stitches and lines must be adjusted to demonstrate a square cube through knitting. The formula to readjust the breadth and length is

1 (Length): 1 (Breadth) = 13 stitches: 8 lines.



8. Research Methods, Prototypes & Materials



The proportion on the paper plan does not equal the knitting structure. The 2 cm × 2 cm square cubic pattern on the paper model requires a 2 cm × 2 cm breadth and length. However, the number of stiches must be changed to 13 stitches in length and 8 lines in breadth to acquire a 16 mm × 16 mm square cube. In addition, the vertical lines for the front knits in the inner square must be reversed to back-knit stitch to create the mountain folds, whereas the horizontal folding lines of the outer square must be reversed to front-knit stitch to present valley folds. The single unit pattern now seems proportionally elongated, but hypothetically this would create a 16 mm × 16 mm square cube as the formula above indicates (Fig. 16).

8. Research Methods, Prototypes & Materials

The knitting experiment was very successful with high contraction and was unaffected by humidity and pressure, creating a permanent structural pleat.

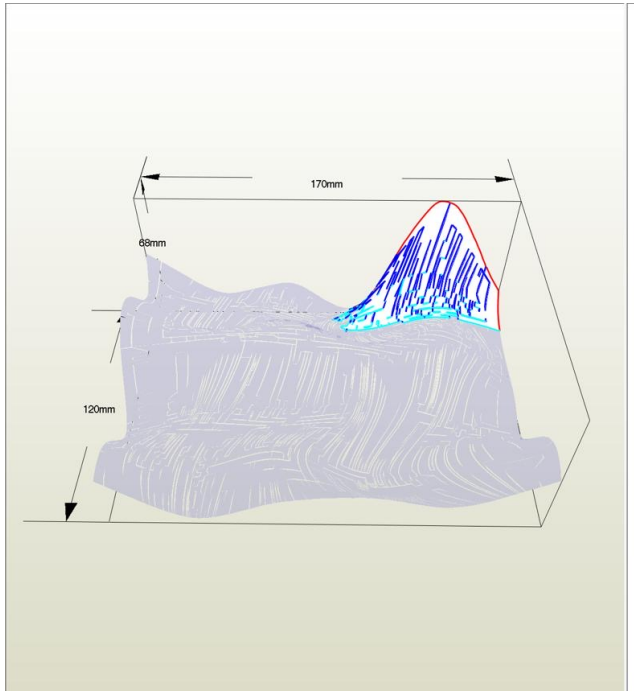
3D Printing Approach 3

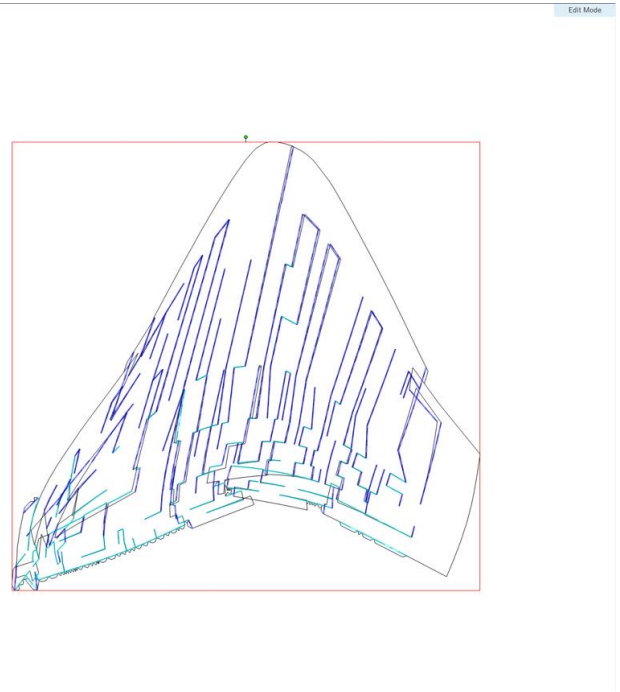
The 3rd approach to breakdown the form is by using Pepakura Designer by Tama Software Ltd.

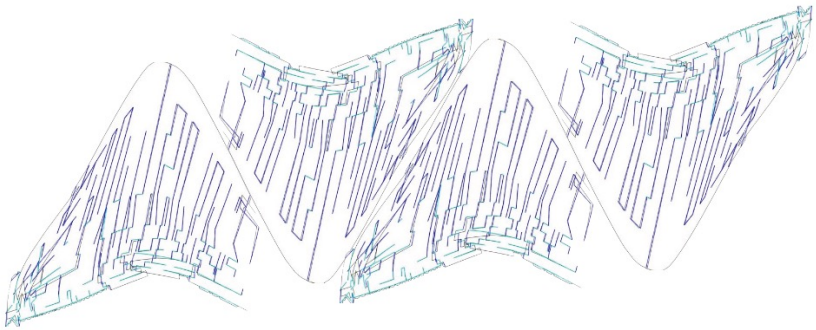
This time, the research team still observed the form, but instead of slicing it into pieces, the team only selected the top right corner of the form.

Based on previous pleating experiences, this corner has the potential to be a single unit as the foundation for further duplication.

The team extracted the single unit and to repeated by mirroring the structure to create a continuous, repetitive patterns for pleating.







3D Printing Pleat

The experiment followed the previous design methodology, that is, starting with paper folding to bring the folds to a tangible form. This practice is very helpful to visualise and to understand the properties and the capacity of the structure in real life.

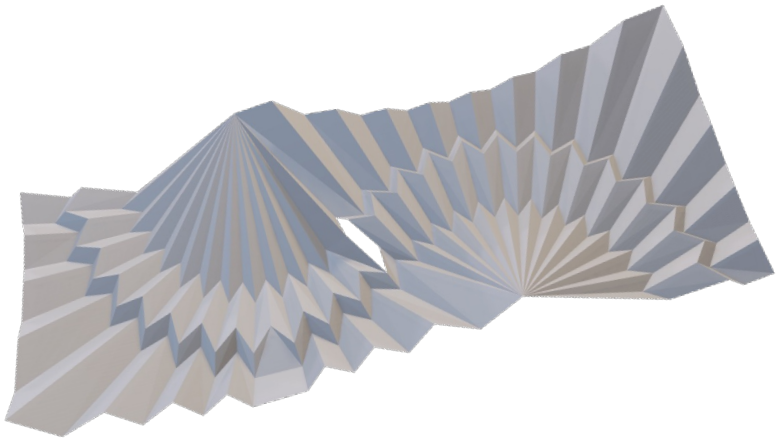
After contraction and expansion and locating it at different areas on human bodies (so we know which part of the body matches the motion of the pattern), the pattern is then flattened with mountain and valley folding lines.

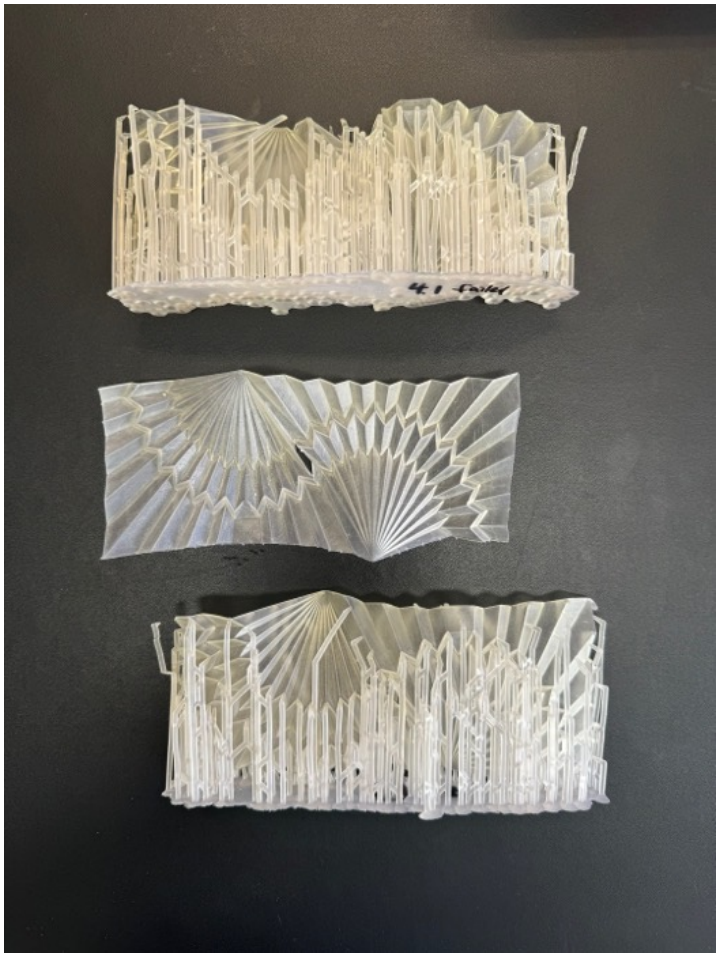
We translated the pattern in 3D Max to obtain an .obj file for 3D printing.

The thickness is set to 1 mm.

3D Pleat Printing

To choose the best solution to produce the 3DP piece that better meets the sustainability goal, we operated them to produce the same model piece and attempted to figure out the most optimized one based on the result. Two potential printing methods were considered for the sample making: direct 3D printing and 3D printed mould. Direct 3D printing boasts the advantage of requiring no additional labour costs, but it has the notable drawbacks of being time-consuming and is plagued by a high failure rate.

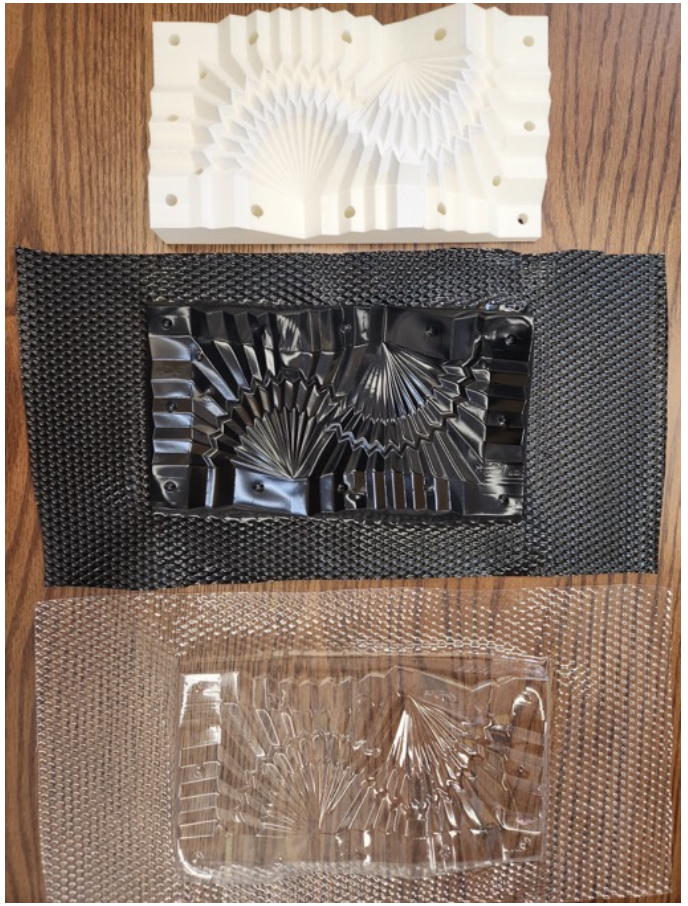




8. Research Methods, Prototypes & Materials

Vacuum Forming Prototyping

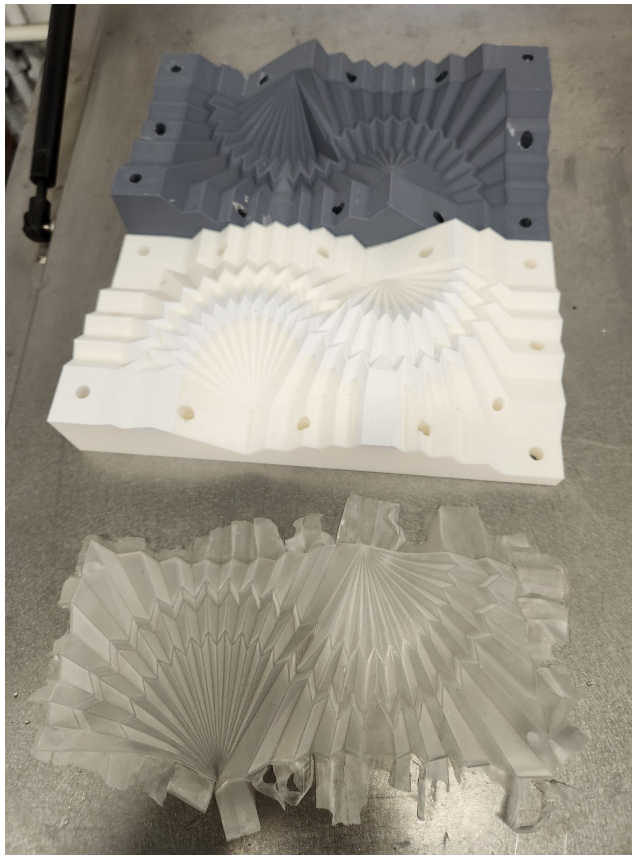
Vacuum forming has the benefit of reduced labour costs, but this approach contends with high failure rates and substantial storage demands.

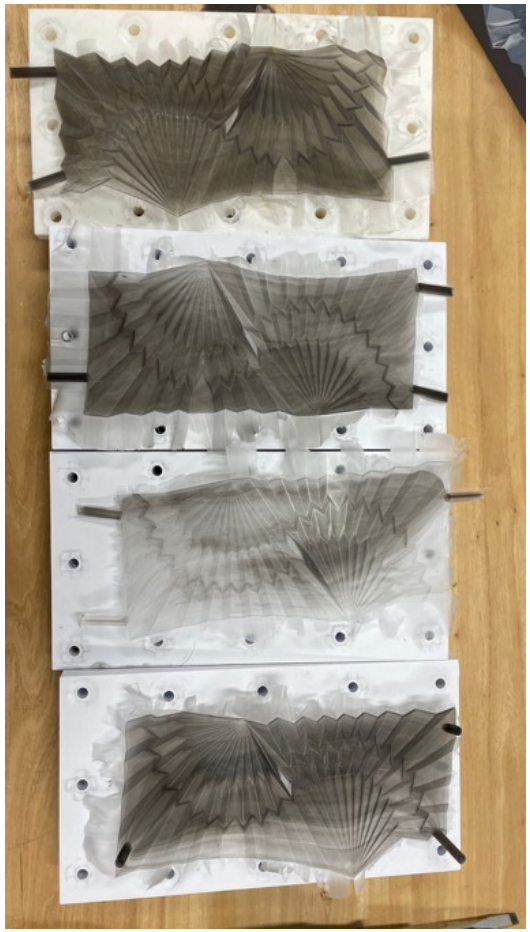


8. Research Methods, Prototypes & Materials

Hybrid Making Technique

The hybrid technique of room temperature vulcanisation (RTV) moulding and polyurethane (PU) casting with 3DP moulds, offers efficiency by replicating more moulds and economic viability through the reuse of moulds.





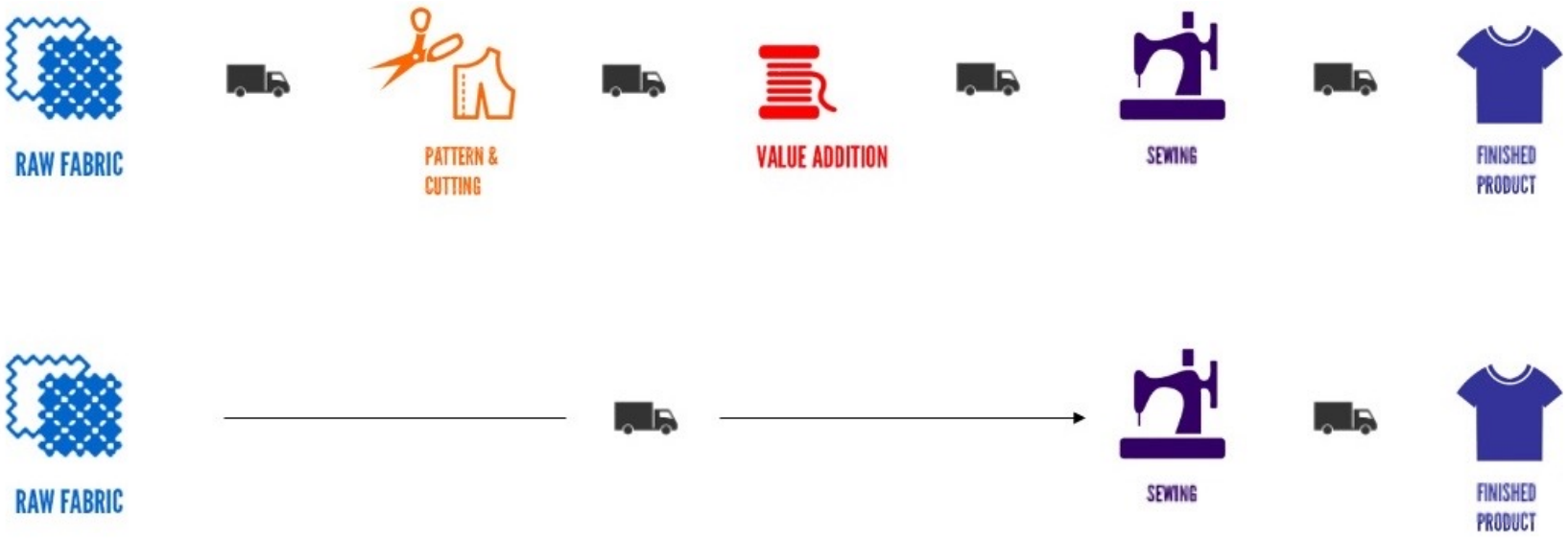
9. Research Outcomes, Findings

Research Question 1: What are the textile manipulation techniques to formulate new type of pleating patterns into tangible form which is not affected by heat and humidity as conventional heat set pleats?

During this study, the new structures were transferred to a different digital software, the square pattern was transferred from Riho 3D V8 to SES122-S 12-gauge machine for knitting, the accordion pattern was transferred from Adobe Illustrator to Rapier Sample Loom for woven structure and the fan-shape pattern was transferred from Pepakura Designer to Riho 3D V8 for 3D printing. The research team analysed the pattern to determine the position of mountain and valley folds, and translated these folding lines into different structures, for example, a mountain fold in digital knitting can be made as a single-sided plain knit, while the fan-shaped is represented by single square dots on a weaving machine.

Research Question 2: Is modern technology the answer to sustainability in pleating?

This research project demonstrates that pleats design can obtain sustainability by eliminating conventional pleating production, which cuts down the cost and the carbon footprint of delivering textile to pleating studios and back to garment factories. It also reduces the intensive labour at pleating studios, which fulfils the ESG goals of *Responsible Consumption and Production'.* In addition, the structural and digital pleats embed folding patterns within textiles or materials, avoiding the diminishing of folds due to humidity and pressure. This prolongs the life span of the products, which shows how technology can be responsible for sustainable production.



9. Research Outcomes, Findings

<u>Research Question 3:</u> How to collect the motion data from modern dance and convert the motion data into visual material for potential pleating patterns?

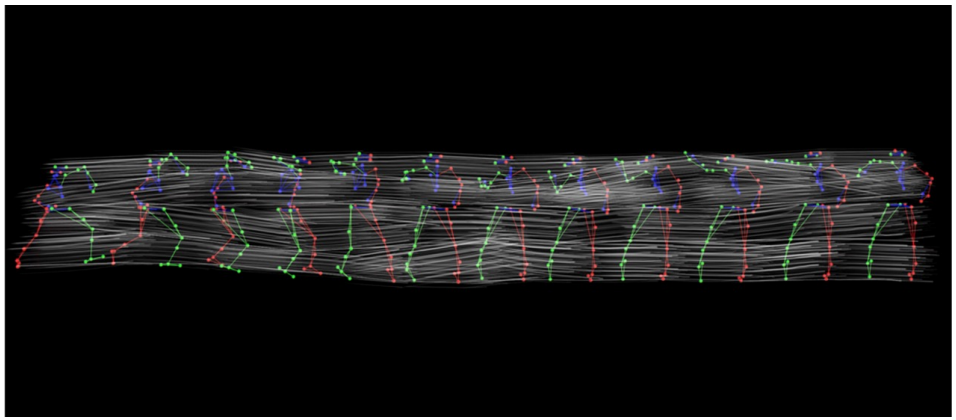
In this research, the motion images were originally captured and the marks on the body were connected to show a continuous trajectory.

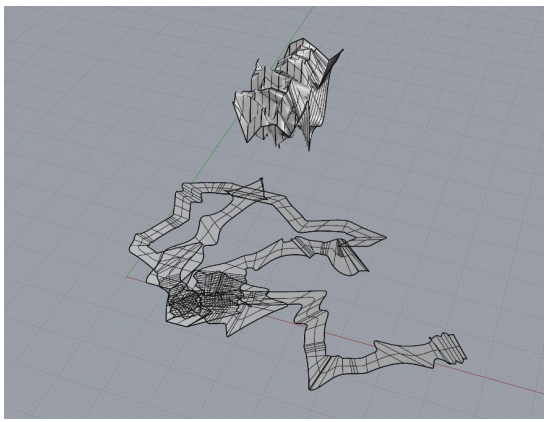
Approach 1 extracted 12 frames from the Vicon and linked the corresponding points to make the linear connections. These lines have the potential to evolve into pleating patterns, especially the two-way stretch ones, for example, accordion pleating and knife pleats.

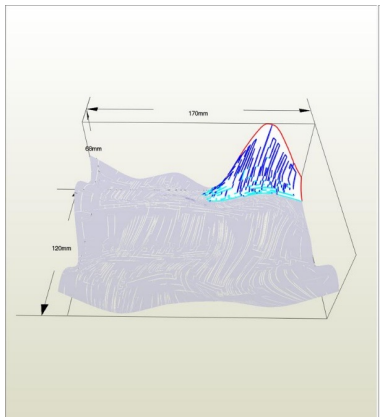
The 2nd and 3rd approaches are first based on the data, which is the distance between the selected marks and the clavicle point. For the duration of 0.5 second, the distance was calculated through **Euclidean Distance** formula, and the outcome was illustrated in the x–y axis chart. The charts of the distance between CLAV. and different points were lined up on the z axis. Each curvature of frame on the y axis was connected to form a curved surface for visual analysis.

While Approach 2 broke down the pattern and laid over each part to generate lines for pleating patterns, Approach 3 used the Pepakura software to cut the surface for potential unit structure for duplication to form pleating patterns.

This study demonstrated that there is an unconventional approach to create unseen pleating patterns through motion.







Motion pleats

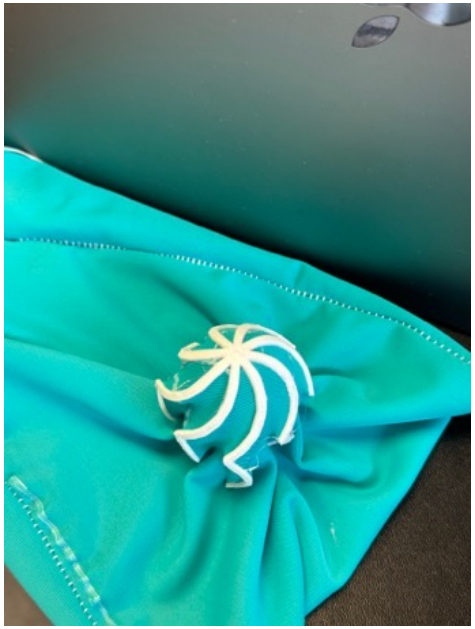
http://youtu.be/PFTDjoQWCR0

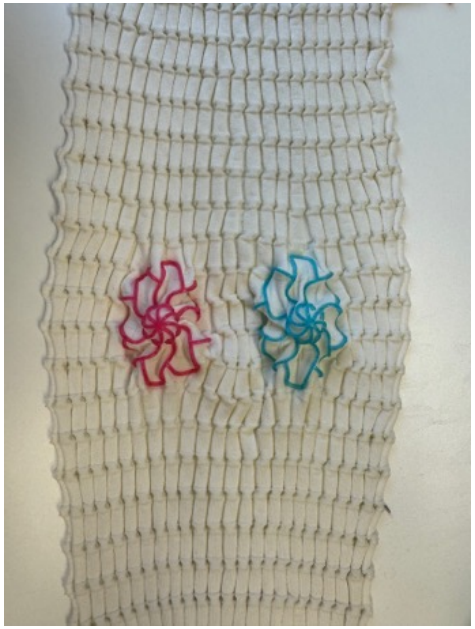
10. Further Research

Due to technological advancement, 3D printing can be directly applied on to textiles as additive materials, which provides unique properties, forms and functionality to conventional fabrics.

In the near future, this study would like to expand the sustainable pleats territory to a mixed approach or multimedia pleats. The preliminary experiments below demonstrated the potential of combining stretchability of textiles and 3D printing to generate innovative pleating structures.

The lycra material and the digital knitted pleats were stretched in the 3D printing machine. After 3D printing, the textile contraction is affected by the printed structure, creating new forms of pleating structures. It is foreseeable that different printed structures and the stretchability of the textiles will offer new types of 3D printed pleating.





11. Research Dissemination

Conference Presentation

1. 27th IFFTI Annual Conference at London College of Fashion, UK March 24th - 28th, 2025

Exhibition

2. Pleat the Interfashionality, 3D printing pleats for Peony Pavilion, *The 6th Art and Science International Exhibition and Symposium*, Tsinghua University, Beijing 12/2023
3. Peony Pavilion, The Fashion Gallery, The Hong Kong Polytechnic University, 2024
4. Fleur de la paix, Exposition Spéciale à Paris et symposium international sur la recherché en art de Dunhuang et les realizations en design par l'Acadêmiedes arts et design de l'Université de Tsinghua, Paris, 2024
5. Flying High, 24 Jun–1 Jul 2024 Paris
6. STANZAE SWI Aug, 2022 Palazzo Branciforte, Palermo

Design Collection Video

7. Style in Motion (2024) https://www.youtube.com/watch?v=lCsX0jcGRqY

Teaching Activity

8. Redesigning Cantonese Opera Costumes with Innovative Folding Structures.
   (School Learning and Teaching Development Grants 2023–2024)

Performance

9. Jade Walking, Venezia Biennale Architettura 2025, Venice, 2025

11. Research Dissemination

Media Coverage

10. Jade walking
11. Flying High

Award

12. Style in Motion

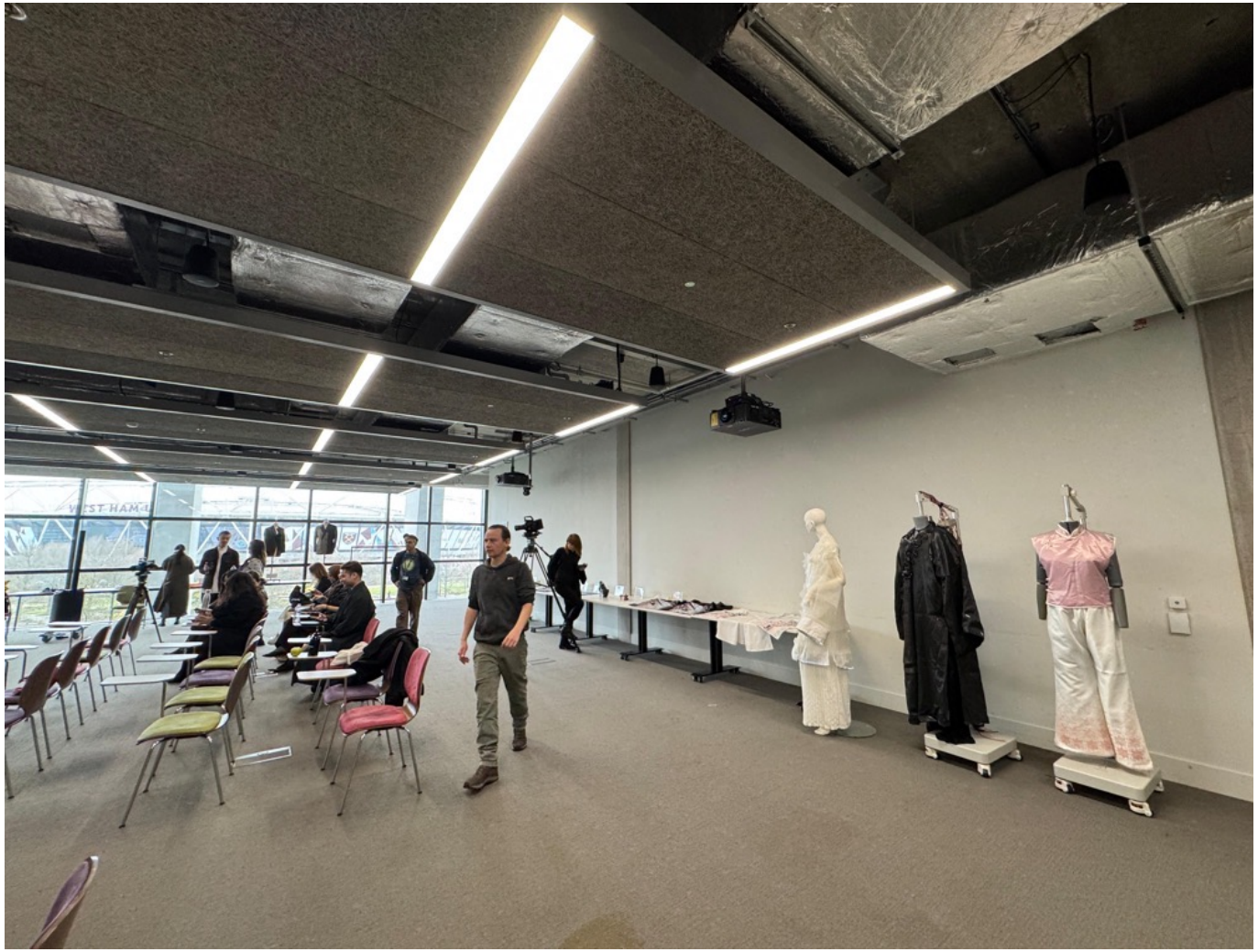
- High Design Quality – Red Dot Award 2025 Concept
- Gold Winner - IDA Design Awards 2024
- Gold Winner - London Design Awards 2024
- Gold Winner - French Design Awards 2024
- Silver Winner - New York Product Design Awards 2024

13. Pat Ka Chiòng

- Silver Winner - New York Product Design Awards 2024
- Bronze Winner - IDA Design Awards 2024

Conference Presentation

1. 27th IFFTI Annual Conference at London College of Fashion, UK March 24th–28th, 2025



Exhibition

2. The 6th Arts and Science International Exhibition and Symposium, Tsinghua University (2024)

Exhibition

3. Peony Pavilion, The Fashion Gallery, The Hong Kong Polytechnic University, 2024

Exhibition

4. Exposition Spéciale à Paris et symposium international sur la recherché en art de Dunhuang et les realizations en design par l'Acadêmiedes arts et design de l'Université de Tsinghua, Paris, 2024

止戈之花

李迎军、黄才骏（香港理工大学时装与纺织学院）、
Annie Yu（香港理工大学时装与纺织学院）
服装设计/2024
清华大学美术学院 敦煌艺术研究及设计成果 巴黎特展暨国际学术研讨会

Fleur de la paix

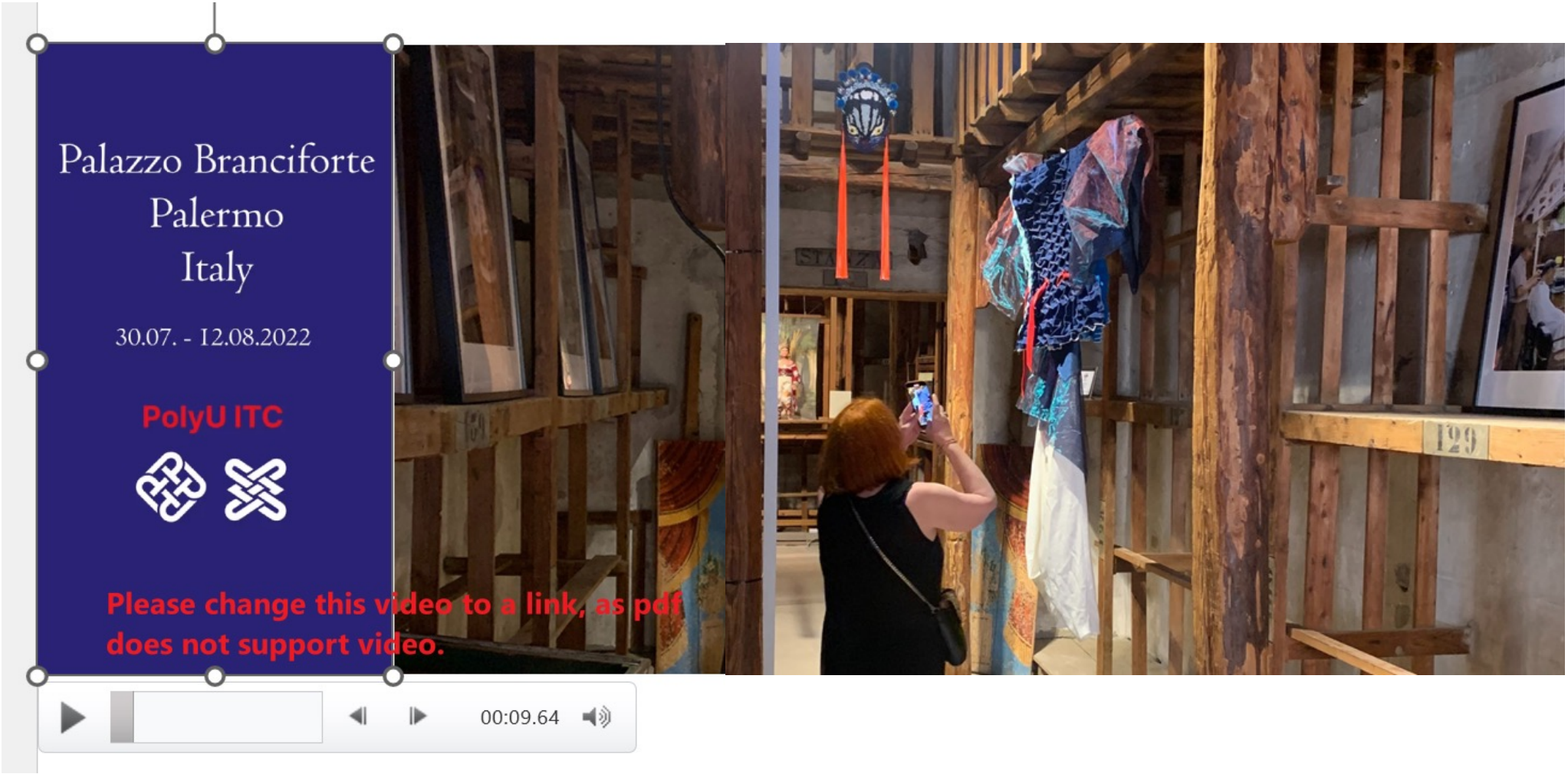
Li Yingjun
Huang Caijun、Annie Yu
Design de mode/2024

Exhibition

5. Flying High, 25 June–01 July 2024 Paris, France

Exhibition

6. STANZAE SWI, 30Jul–12 Aug 2022, Palermo, Sicily



Design Collection Video

7. Style in Motion (2024) https://www.youtube.com/watch?v=lCsX0jcGRqY

Teaching Activity

8. Redesigning Cantonese Opera Costumes with Innovative Folding Structures
(School Learning and Teaching Development Grants 2023–2024, School of Fashion and Textiles, The Hong Kong Polytechnic University)

Performance

9. Venezia Biennale Architettura 2025, 11 May 2025, Venice, Italy





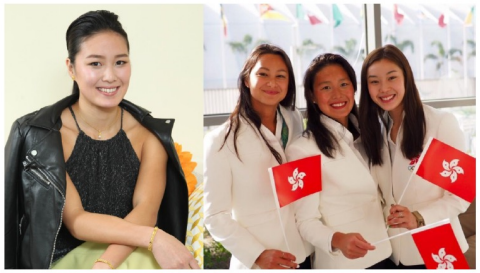
Media Coverage

10. Jade Walking Venezia Biennale Architettura 2025

COMMENT > OPINION

Venice premiere of The Jade Walkers to showcase HK cultural soft power | Cultural Exchange | Bernard Charnwut Chan

OPINION 07-05-2025 10:41 HKT



Yvette Kong, seen with teammates Camille Cheung and Stephanie Au, is a former Olympic swimmer turned artist and cultural visionary.

Hong Kong's cultural narrative reaches new heights with "The JadeWalkers," an extraordinary performance art project transforming the city's architectural and textile heritage into captivating, living sculptures.

Led by former Olympic swimmer turned artist and cultural visionary Yvette Kong Man-yi, this project embodies her passion for reinventing heritage through interdisciplinary storytelling and performance.

As the founder of Transversal Lab and a lecturer at Massachusetts Institute of Technology, she seamlessly integrates creativity with social impact, celebrating Hong Kong's rich heritage while promoting international cultural exchange.

https://www.thestandard.com.hk/opinion/article/301902/Venice-premiere-of-The-Jade-Walkers-to-showcase-HK-cultural-soft-power-Cultural-Exchange-Bernard... 1/

03/07/2025, 10:14 Venice premiere of The Jade Walkers to showcase HK cultural soft power | Cultural Exchange | Bernard Charnwut Chan

The Standard

He expertly blends traditional craftsmanship with advanced 3D fabrication techniques.

The team has designed stunning creations that feature bamboo scaffolding motifs, pleats influenced by Cantonese opera, and color palettes inspired by dragons. These seamlessly merge Hong Kong's cultural heritage with cutting-edge innovation and incorporate Mexican textile traditions.

At the heart of the performance are the Brooklyn Jumbies, a renowned American stilt-dancing collective celebrated for blending traditional Caribbean and African performance art with contemporary storytelling to create visually breathtaking and culturally elaborate spectacles.

The towering, stilt-walking "Moko Jumbies" have been reimagined to reflect Hong Kong's iconic skyline and the legendary Yang Warriors of Chinese folklore.

They embody diverse cultural influences, symbolizing strength and resilience, and their graceful movements are accompanied by live music performed by four students from the Conservatorio di Musica.

The JadeWalkers will premiere as a prestigious collateral event at the 19th edition of the Venice Architecture Biennale on Sunday, before embarking on an international tour designed to showcase Hong Kong's cultural soft power and solidify the city's reputation as a global hub for creativity and innovation.

This extraordinary international collaboration is a living archive of heritage and imagination, inviting international audiences to experience Hong Kong through a bold, visionary lens.

Bernard Charnwut Chan is chairman of Tai Kwun Culture & Arts Co Ltd

Chan, B. C. (2023, December 6). Venice premiere of The Jade Walkers to showcase HK cultural soft power. The Standard. https://www.thestandard.com.hk/opinion/article/301902

Reproduced with permission from both the author and the publisher.

03/07/2025, 10:15 The JadeWalkers: Hong Kong's Cultural Heritage Goes Global

EMPOWERMENT·FEATURES | 29.04.2025

The JadeWalkers: Hong Kong's Cultural Heritage Goes Global

CAROLINE TAM

#江念懿 #香港蛙后 #奧運 #Olympics #Art #Chinese culture #yvette kong

The Jessica Charitable Foundation is proud to partner with The JadeWalkers, a visionary performance art project led by former Hong Kong Olympian Yvette Kong, aligning with our shared mission of empowering women and youth.

Picture towering Moko Jumbies, performed by the renowned Brooklyn Jumbies, striding through Venice's historic streets, their sculptural outfits weaving Hong Kong's textile legacy with Mexican artistry, accompanied by four musicians from the Conservatorio di Musica. Envision Yvette as "The Female Warrior," radiating resilience and grace. Premiering at the 19th Venice Biennale on May 11, 2025, The JadeWalkers will tour globally and has the potential to become a cultural moment at Hong Kong's 15th National Games in November 2025, celebrating the city's cultural identity. Support this vision—donate and grab your tickets today!

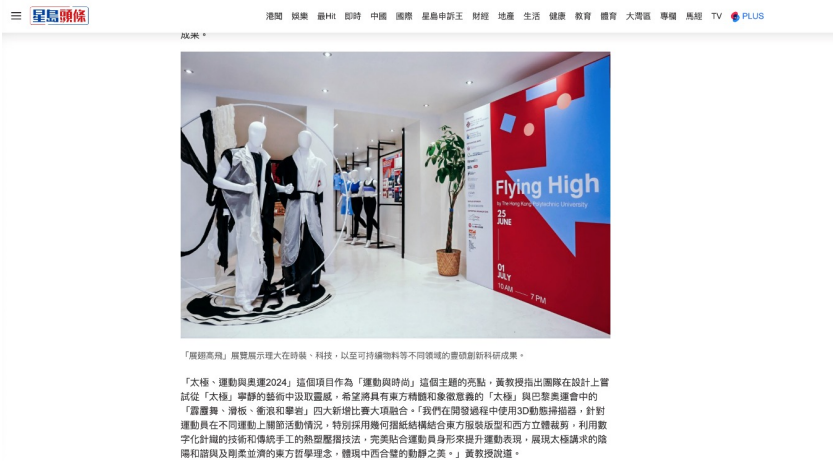
https://www.jessicahk.com/global/the-jadewalkers-hong-kong-heritage 1/17

JESSICA Magazine is the original source
https://www.jessicahk.com/the-jadewalkers-hong-kong-heritage

Media Coverage

11. Flying High

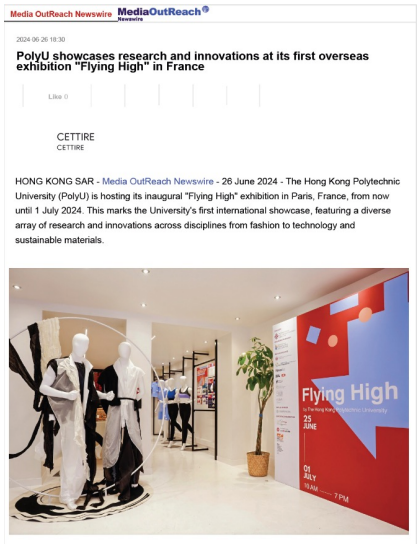
https://paper.hket.com/article/3783193/%E7%90%86%E5%A4%A7%E3%80%8C%E5%B1%95%E7%BF%85%E9%AB%98%E9%A3%9B%E3%80%8D%20%E5%B7%B4%E9%BB%8E%E8%BE%A6%E5%89%B5%E7%A7%91%E5%B1%95



星島頭條（2024年8月9日）。〈知情達理| 理大卓越創新科研 國際舞台放異彩〉。取自 https://www.stheadline.com/cm/3371560/

經星島頭條授權轉載

www.fengshows.com/article/587bb3e1-f9d8-47dd-ada7-ef5ebf2ed576



The article is quoted from ET Net website. https://www.etnet.com.hk/www/tc//news/mediaoutreach_news_detail.php?newsid=308506&page=77

Award

12. Style in Motion

Award

13. Pat Ka Chiòng

Reference

1) Adamson, G. (2015). Craft in the Digital Age. In: J. Openshaw, ed., *Postdigital Artisans: Craftsmanship with a New Aesthetic in Fashion, Art, Design and Architecture*. Amsterdam: Frame Publishers.

2) Alalouch, C. (2018). A pedagogical approach to integrate parametric thinking in early design studios. *International Journal of Architectural Research: ArchNet- IJAR*, 12(2), pp.162–181.

3) Bolton, A. (2016). *Manus × Machina: Fashion in an age of technology*. New York: The Metropolitan Museum of Art.

4) Braddock Clarke, S., & Harris, J. (2012). *Digital visions for fashion and textiles: Made in code*, London: Thames & Hudson.

5) Broadbent, J. (2003). Generations in design methodology. *The Design Journal*, 6(1), pp. 2–13.

6) Checkland, P. (2000). Soft systems methodology: A thirty-year retrospective. *Systems Research and Behavioral Science*, 17(S1), pp. S11–S58.

7) Frankjær, R. & Dalsgaard, P. (2018). Understanding craft-based inquiry in HCI. In: *Proceedings of the 2018 on Designing Interactive Systems Conference 2018 - DIS '18*. [online] Hong Kong: ACM Press, pp. 473–484. Available at: <https://dl.acm.org/doi/10.1145/3196709.3196750> [Accessed 24 August 2020].

8) Jackson, M. C. & Keys, P. (1984). Towards a system of systems methodologies. *Journal of the Operational Research Society*, 35(6), pp. 473–486.

9) Maclaurin, A., & Monks, A. (2015). *Costume: Readings in Theatre Practice*. London: Palgrave.

10) Mills, J. (2014). Methodology and Methods, In: Mills, J., & Birks, M. (ed.) *Qualitative Methodology: A Practical Guide*. London: Sage Publications Ltd, pp. 31–44.

Reference

11) O'brien, R. (2001). An overview of the methodological approach of action research, In: Richardson, R. (ed.) *Theory and Practice of Action Research.* João Pessoa, Brazil: Universidade Federal Da Paraíba.

12) Oakley, P. (2014). Crafting with digital technologies: Issues in Practice. Making Futures Journal, Vol.3, Plymouth College of Art.

13) Practice. *Making Futures Journal*, Vol.3, Plymouth College of Art.

14) Oakley, P. (2015). Digital crafting: Defining the field in 2015. *Making Futures Journal*, 4 (1). pp. 1–5.

15) Openshaw, J. (2015). *Postdigital artisans: Craftsmanship with a new aesthetic in fashion, art, design and architecture*. Amsterdam: Frame Publishers.

16) Oxman, R. & Gu, N. (2015). Theories and models of parametric design thinking. In: *ECAAEE Conference 2015, Vienna*. [online] Vienna.

17) Steele, V. (ed.) (2013) *Dance and fashion*. New York: Yale University Press.

18) Jessica Magazine. Access: https://www.jessicahk.com/the-jadewalkers-hong-kong-heritage, 03/07/2025