

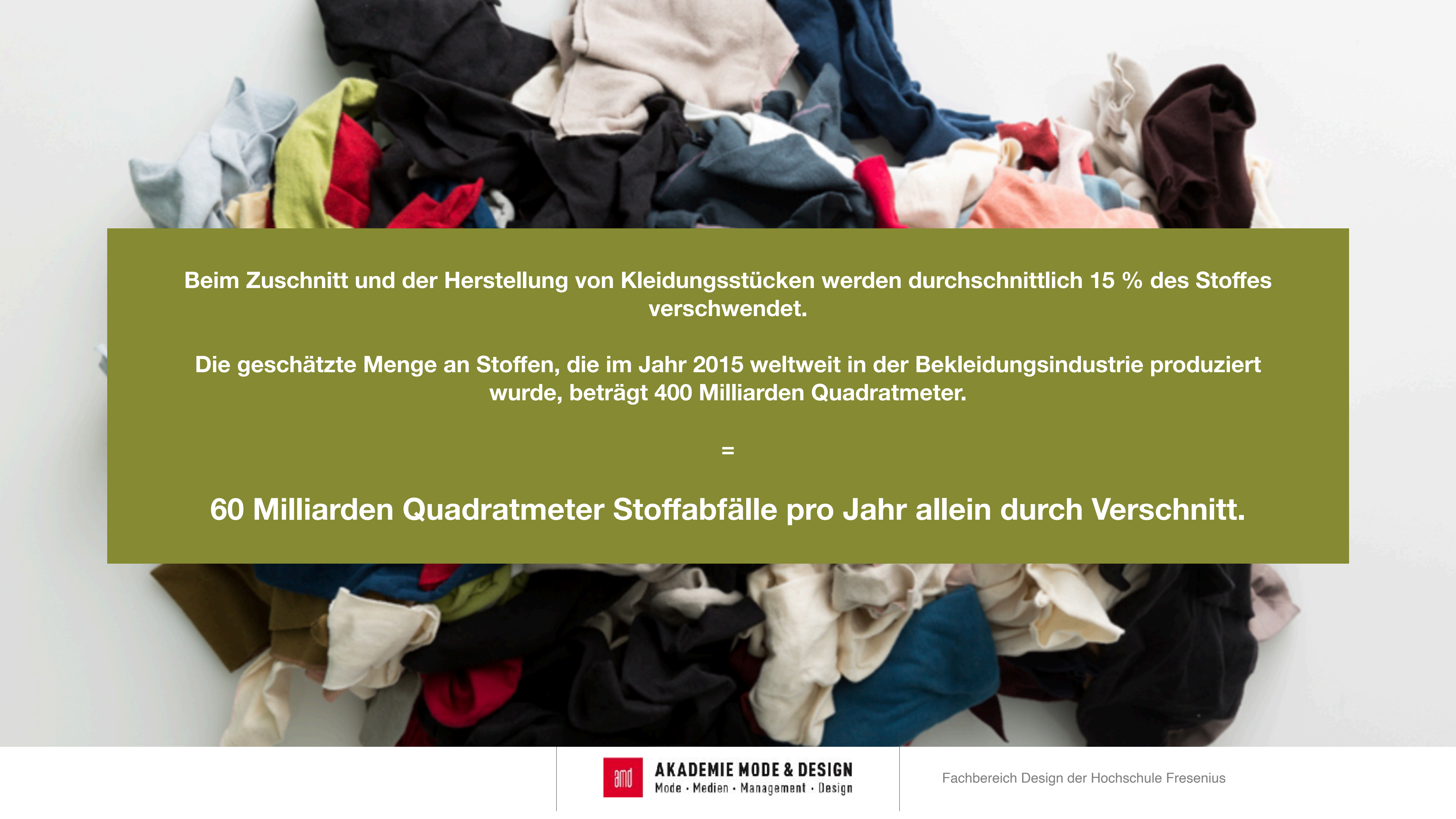


Zero-Waste-Design



AKADEMIE MODE & DESIGN
Mode • Medien • Management • Design

Fachbereich Design der Hochschule Fresenius



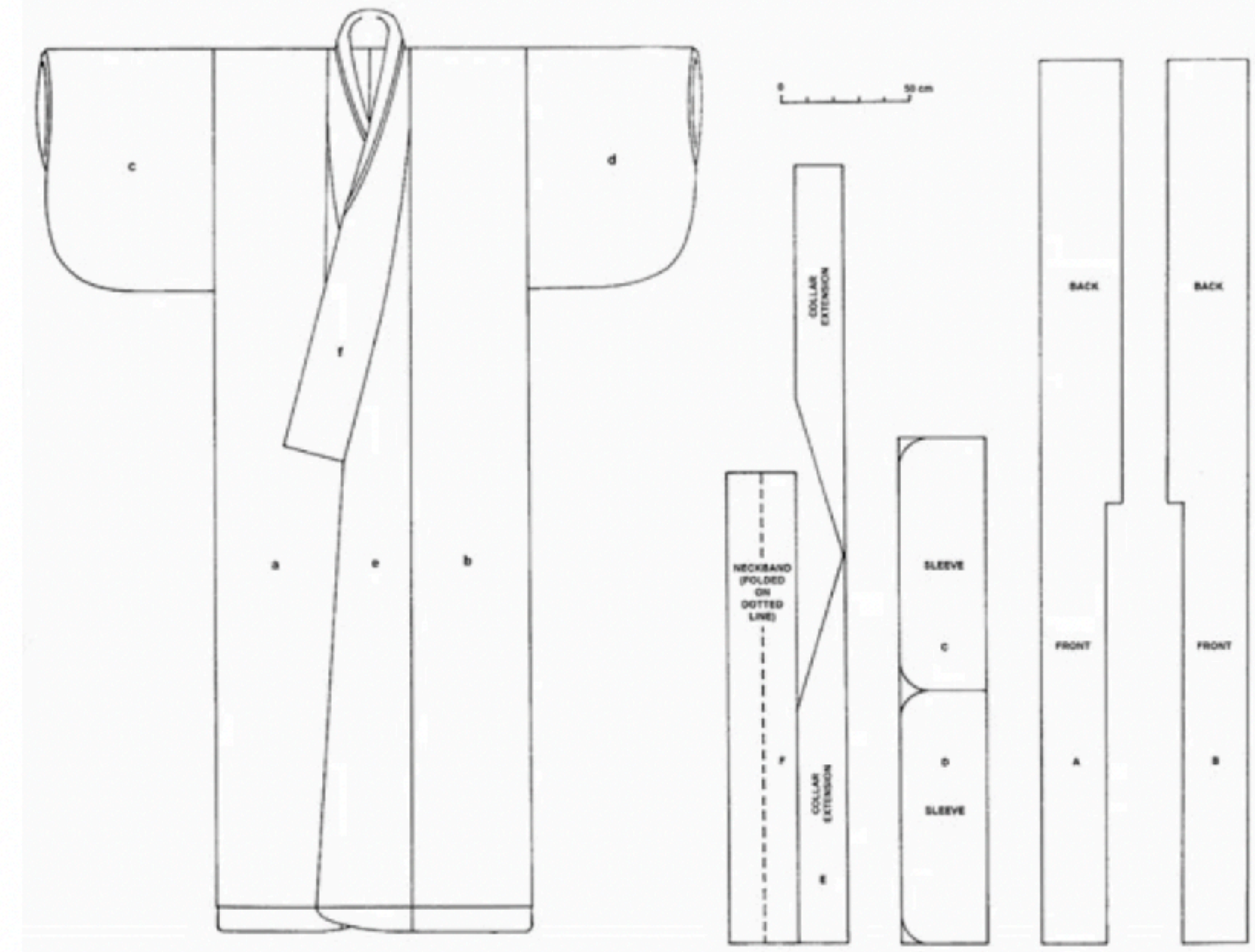
Beim Zuschnitt und der Herstellung von Kleidungsstücken werden durchschnittlich 15 % des Stoffes verschwendet.

Die geschätzte Menge an Stoffen, die im Jahr 2015 weltweit in der Bekleidungsindustrie produziert wurde, beträgt 400 Milliarden Quadratmeter.

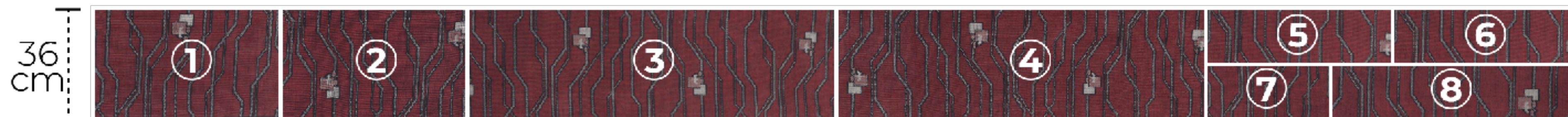
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60 Milliarden Quadratmeter Stoffabfälle pro Jahr allein durch Verschnitt.

ZERO-WASTE HISTORY: THE KIMONO

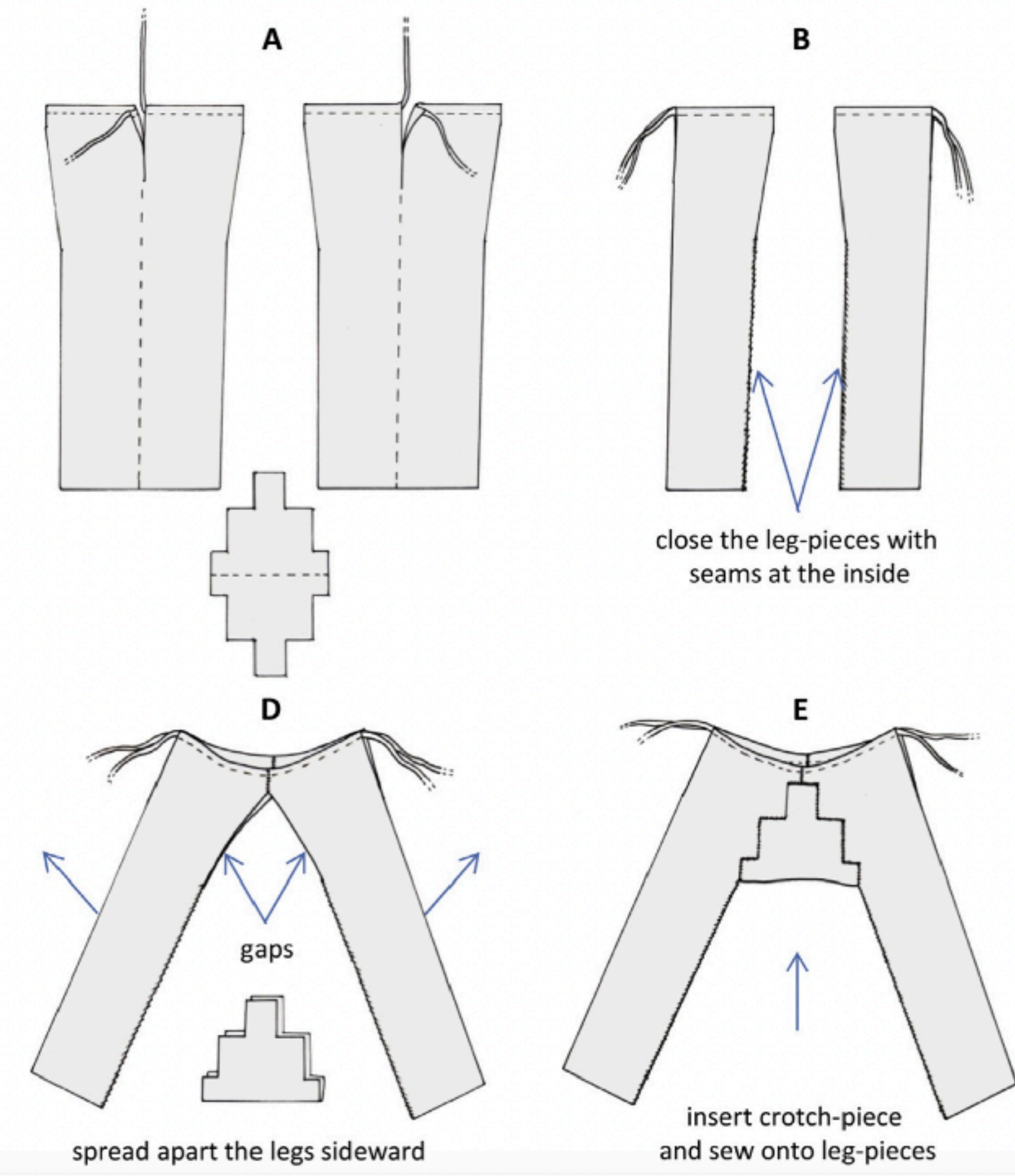
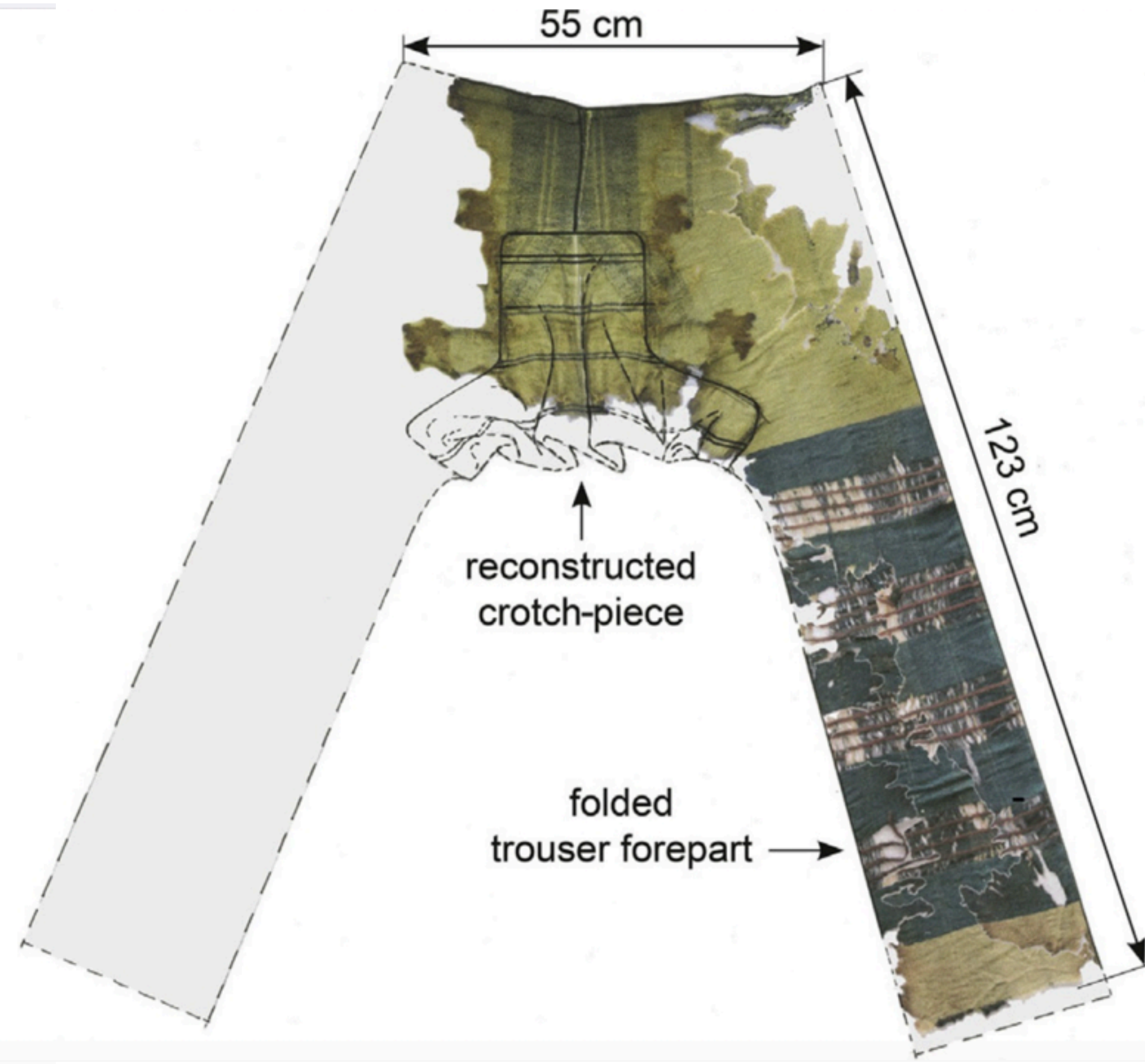


36 cm x 12 m fabric for one kimono

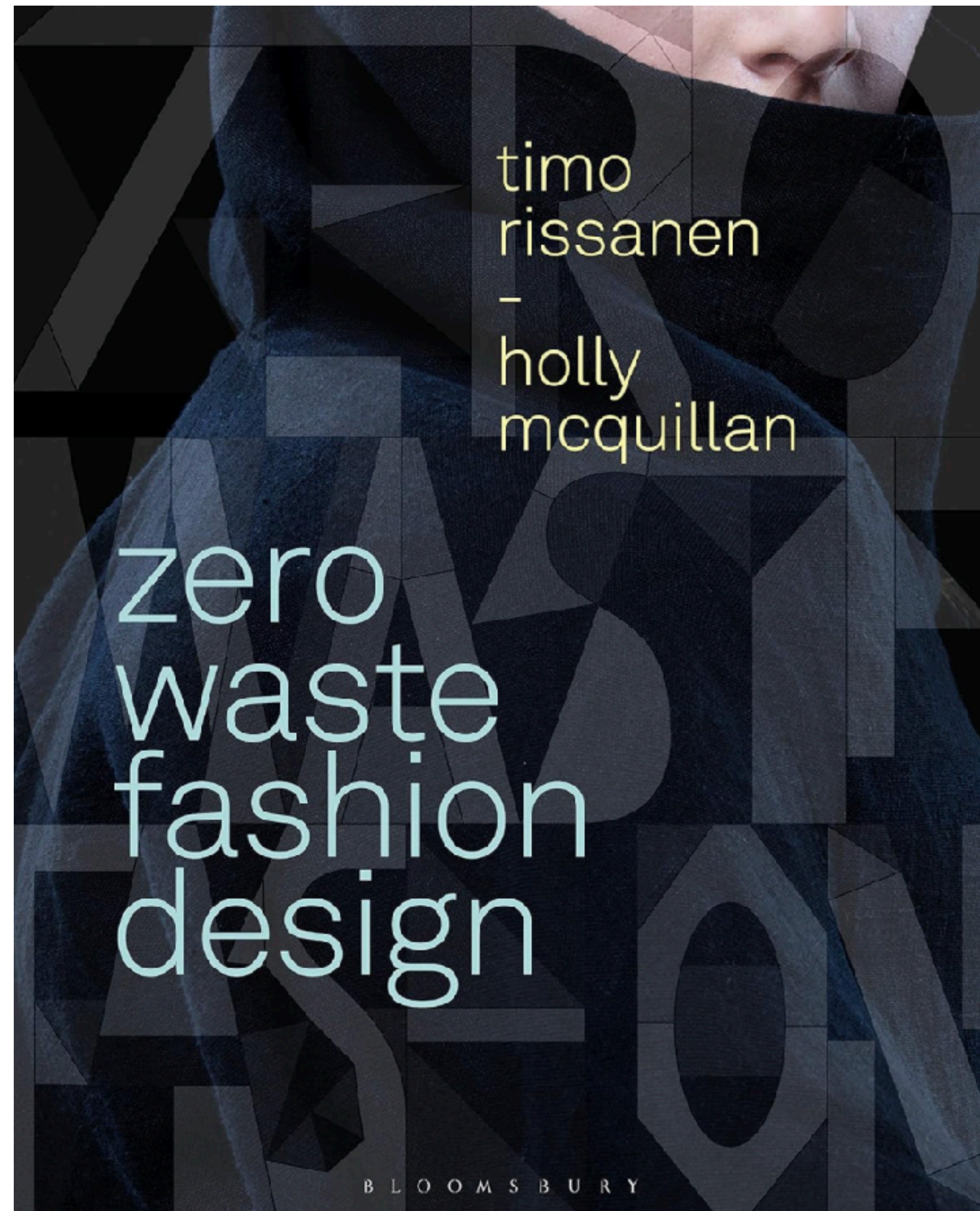


①②: Sleeves ③: Right side body segment ④: Left side body segment ⑤⑥: Front overlap
⑦: Over collar ⑧: Collar

ZERO-WASTE HISTORY: THE OLDEST TROUSERS



China, 1122-926 B.C



Zero Waste Fashion Design

Bloomsbury Visual Arts; 1. Edition

Zero Waste Fashion Design combines research and practice to introduce a crucial sustainable fashion design approach.

Written by two industry leading pioneers, Timo Rissanen and Holly McQuillan, the book offers flexible strategies and easy-to-master zero waste techniques to help you develop your own cutting edge fashion designs.

Sample flat patterns and more than 20 exercises will reinforce your understanding of the zero waste fashion design process. Beautifully illustrated interviews with high-profile, innovative designers, including Winifred Aldrich, Rickard Lindqvist and Yeohlee Teng, show the stunning garments produced by zero waste fashion design.

Featured topics include:

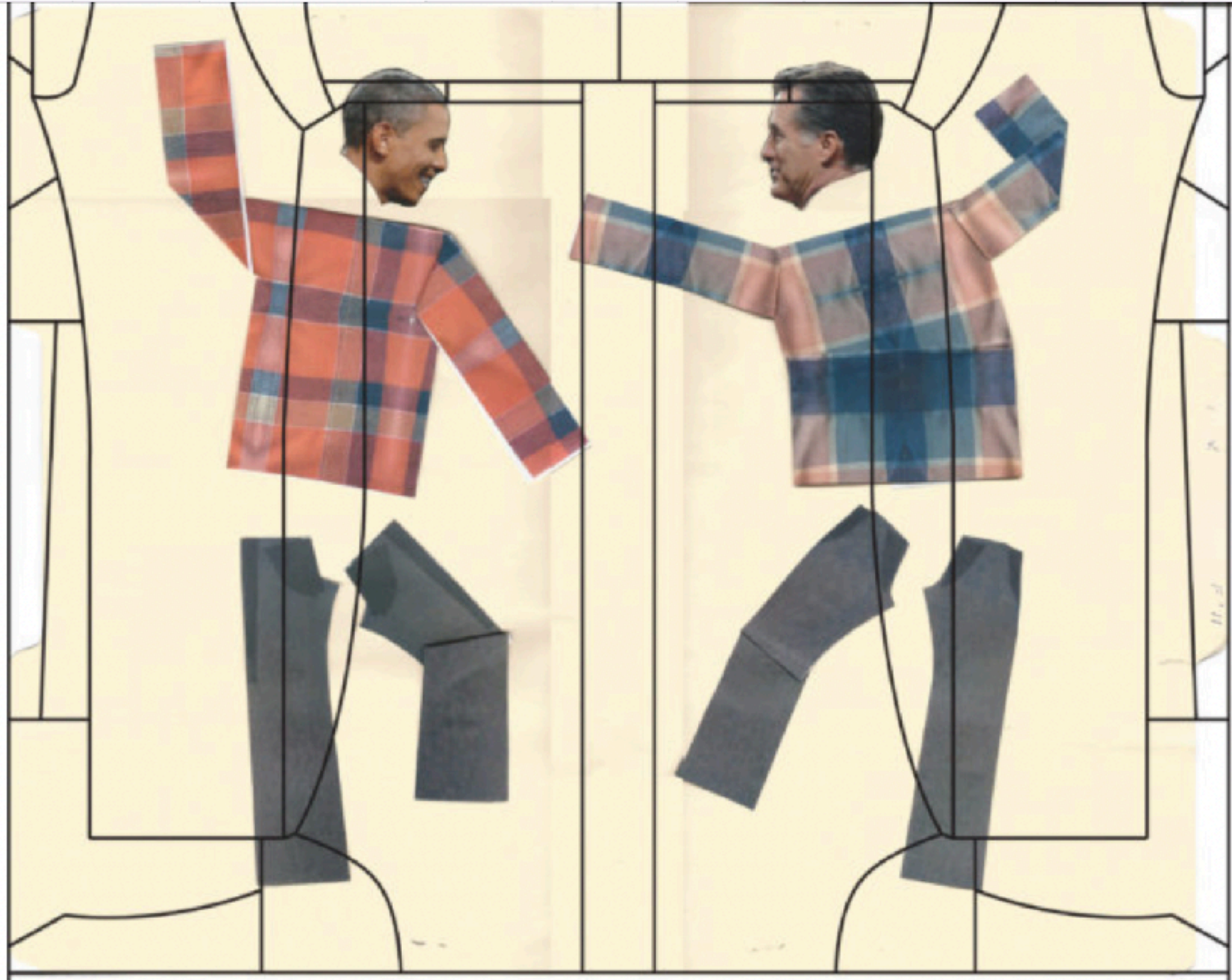
The criteria for zero waste fashion design

Manufacturing zero waste garments

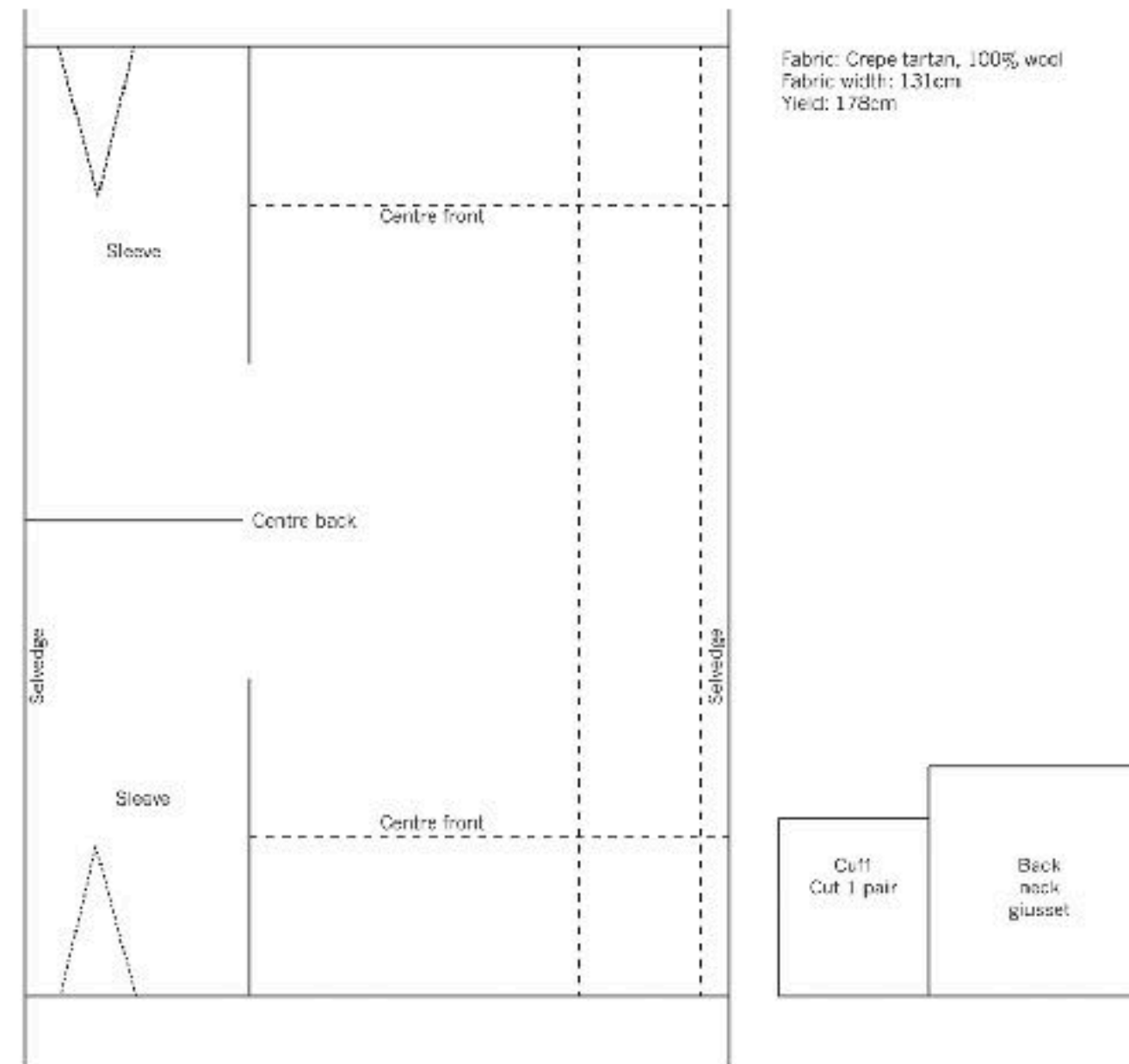
Adapting existing designs for zero waste

Zero waste designing with digital technologies

DESIGNER SPOTLIGHT: Timo Rissanen



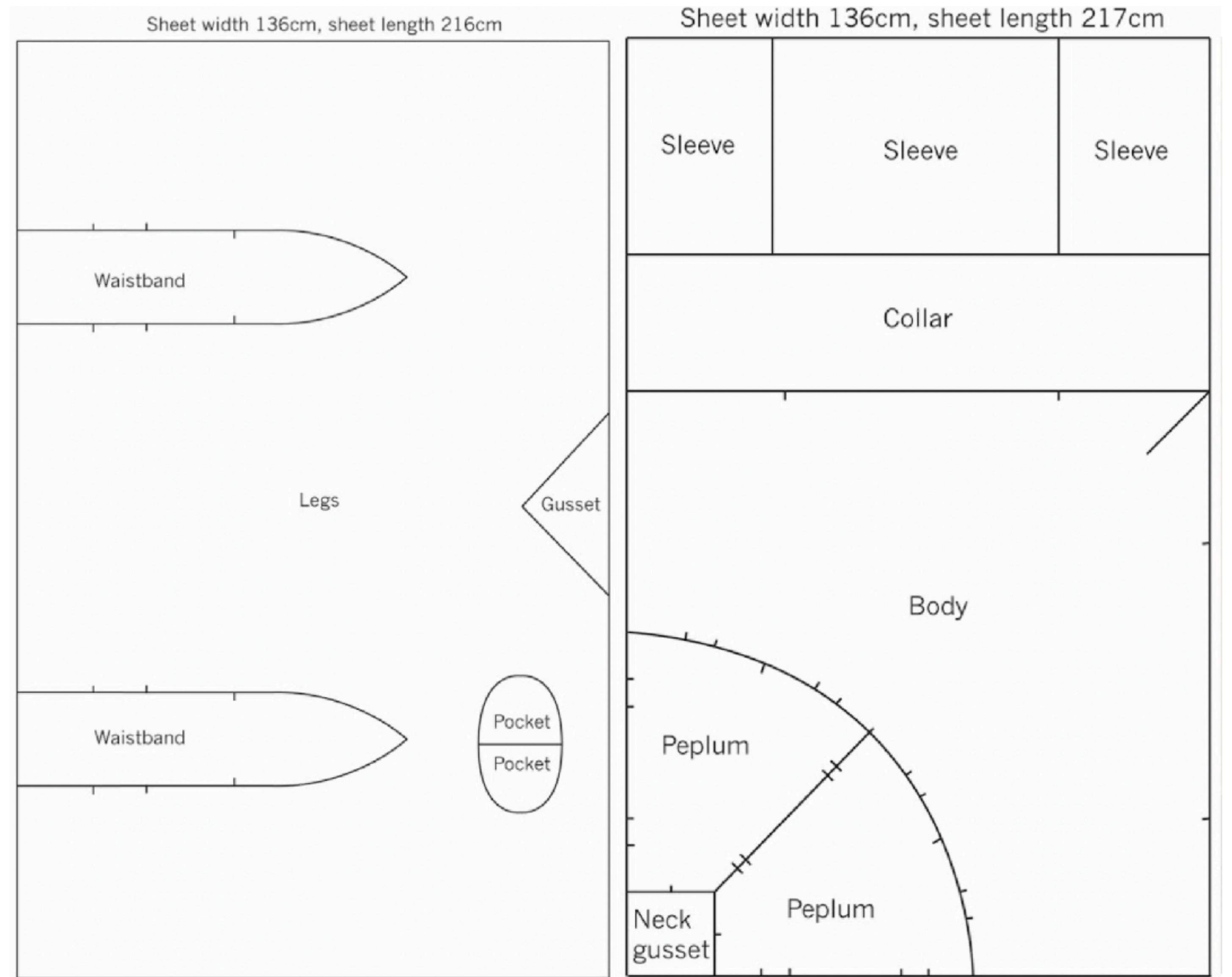
Timo Rissanen
Professor at the University of Technology Sydney, Australia
<https://www.seamwork.com/articles/zero-waste-design>



„You have to bring the patternmaking and the cutting and the making into the design process...pattern is important for me because it's key to eliminating fabric waste.”

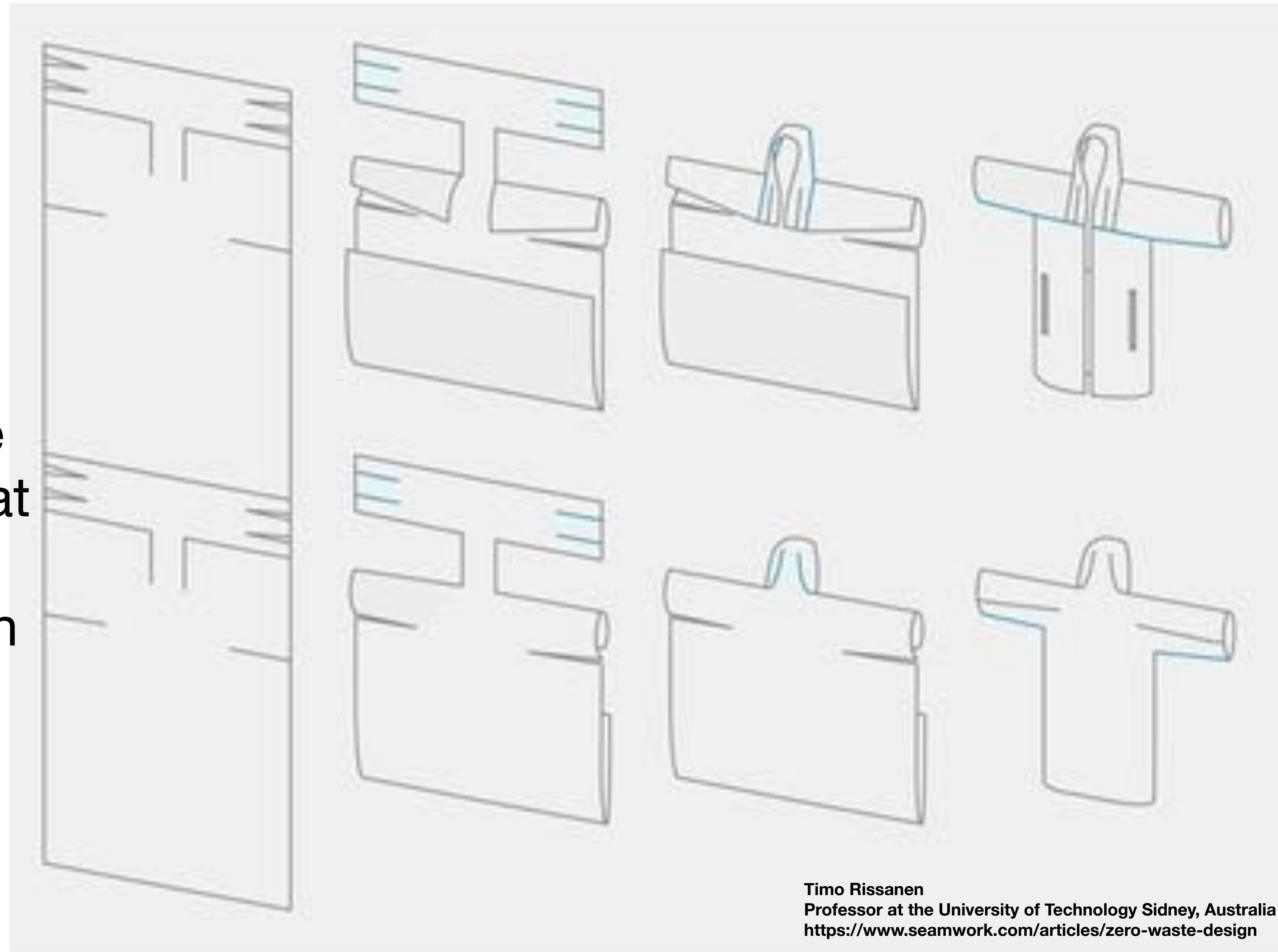


“Essentially, I’m going from the largest pieces to smallest as the design process progresses.”



Timo Rissanen
Professor at the University of Technology Sidney, Australia
<https://www.seamwork.com/articles/zero-waste-design>

„...Rissanen emphasizes the design process is an iterative one. His first pattern, fittings, and alterations focus on garment shape. Once that works, he looks at the pattern pieces on the actual fabric width and begins designing the garment details, like the collar and cuffs for a shirt.“

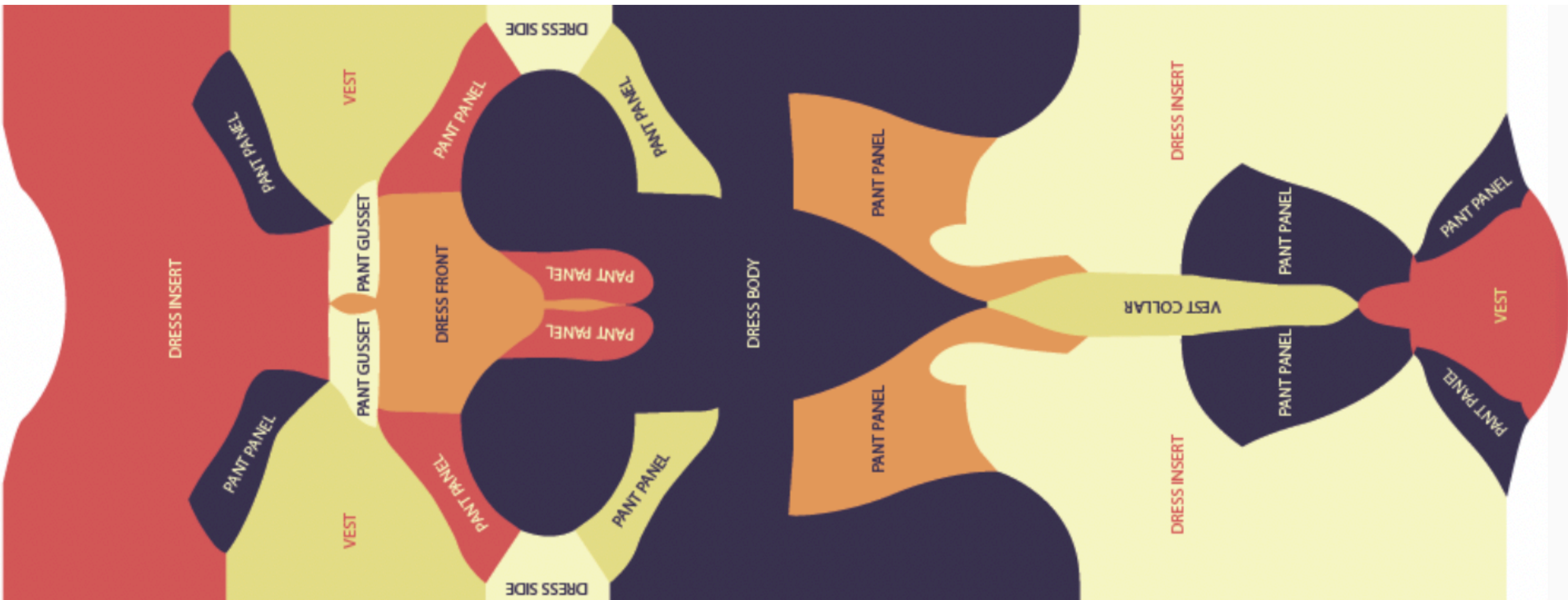


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DESIGNER SPOTLIGHT: Holly McQuillan

„Zero waste patterns which explore the possibilities of embedding multiply garments in one pattern.“

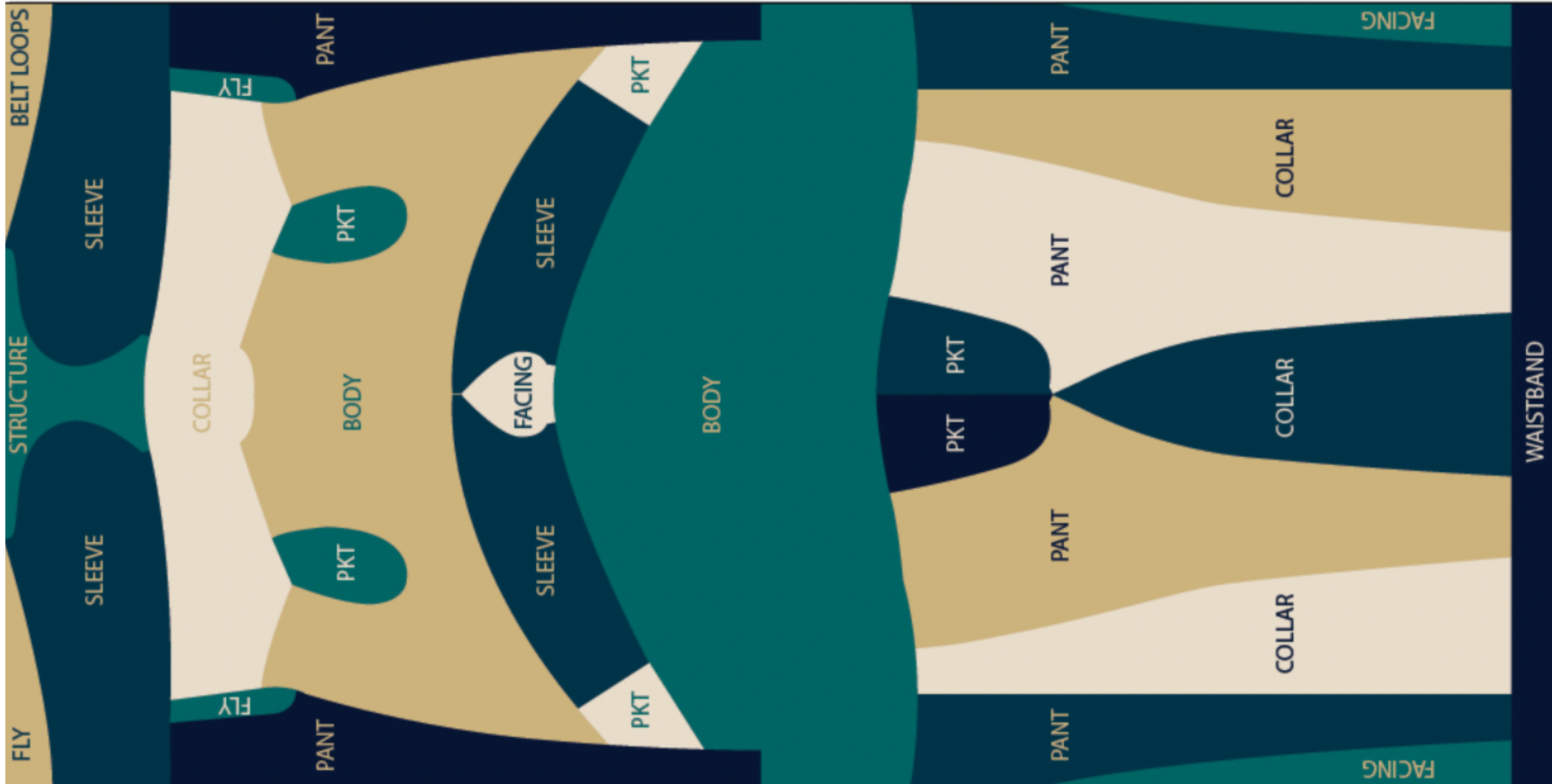


Project: Twinset (2011)



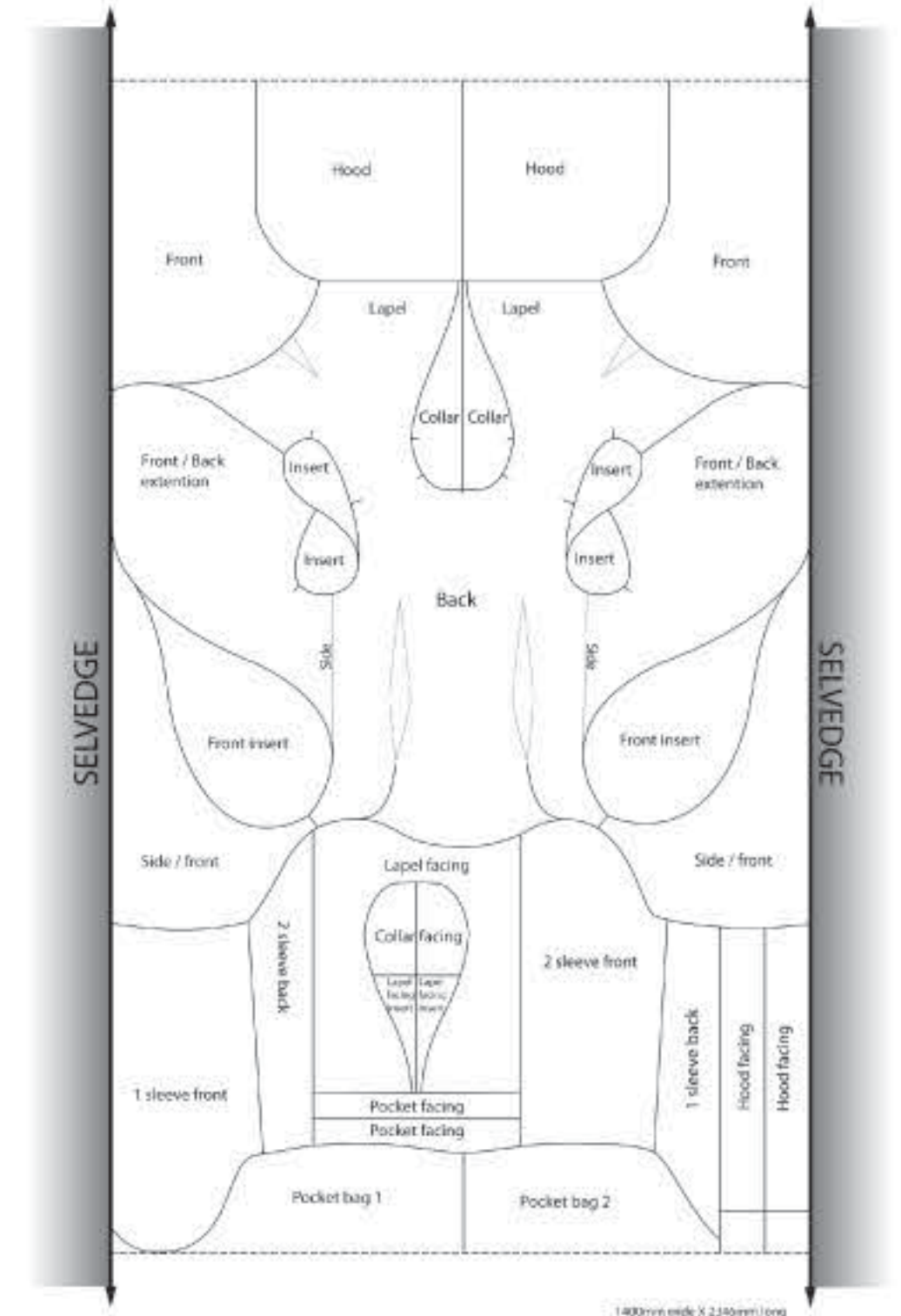
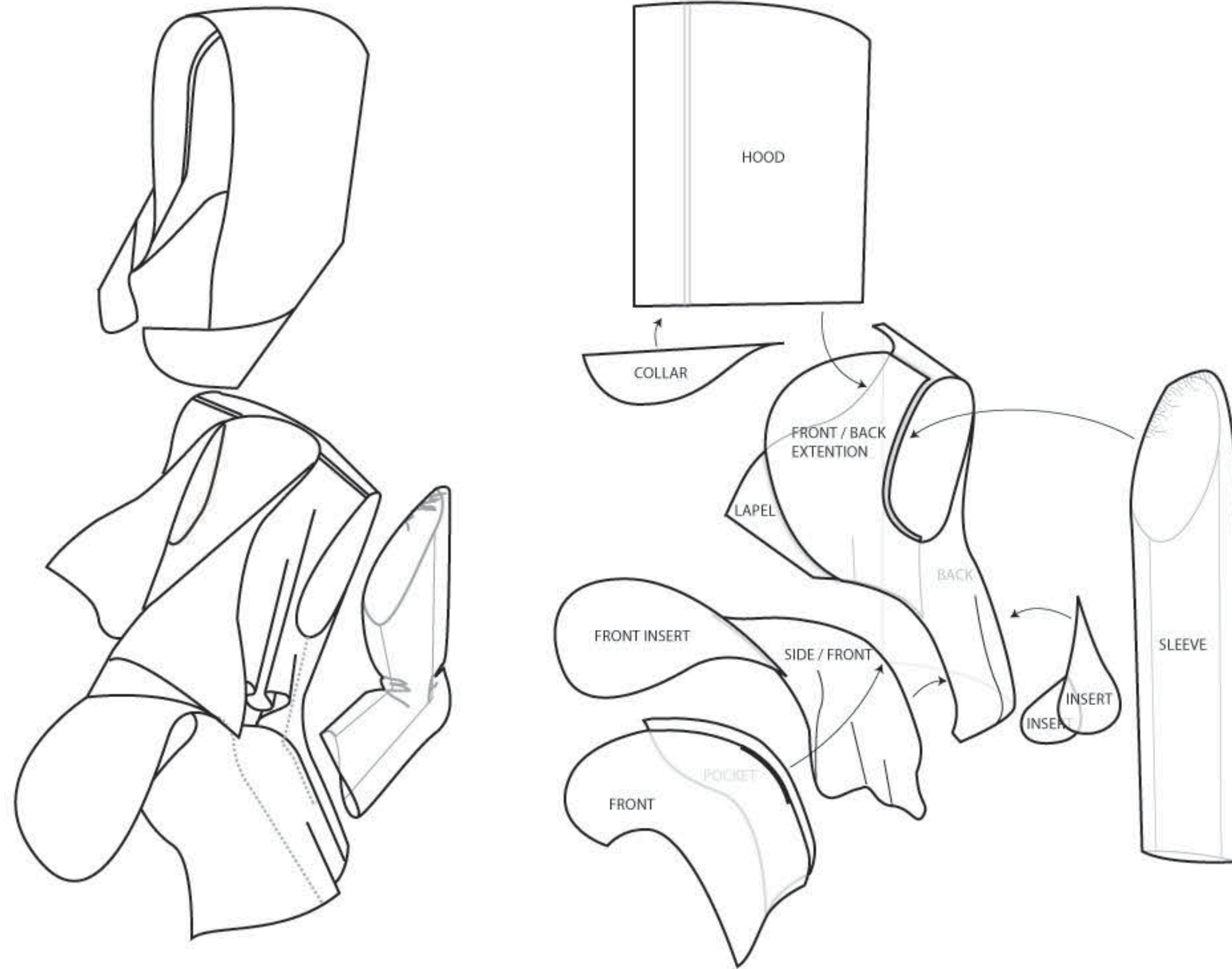
Holly McQuillan
Designer, writer and zero waste advocate
<https://hollymcquillan.com>

ZERO-WASTE: Hose und Hemd



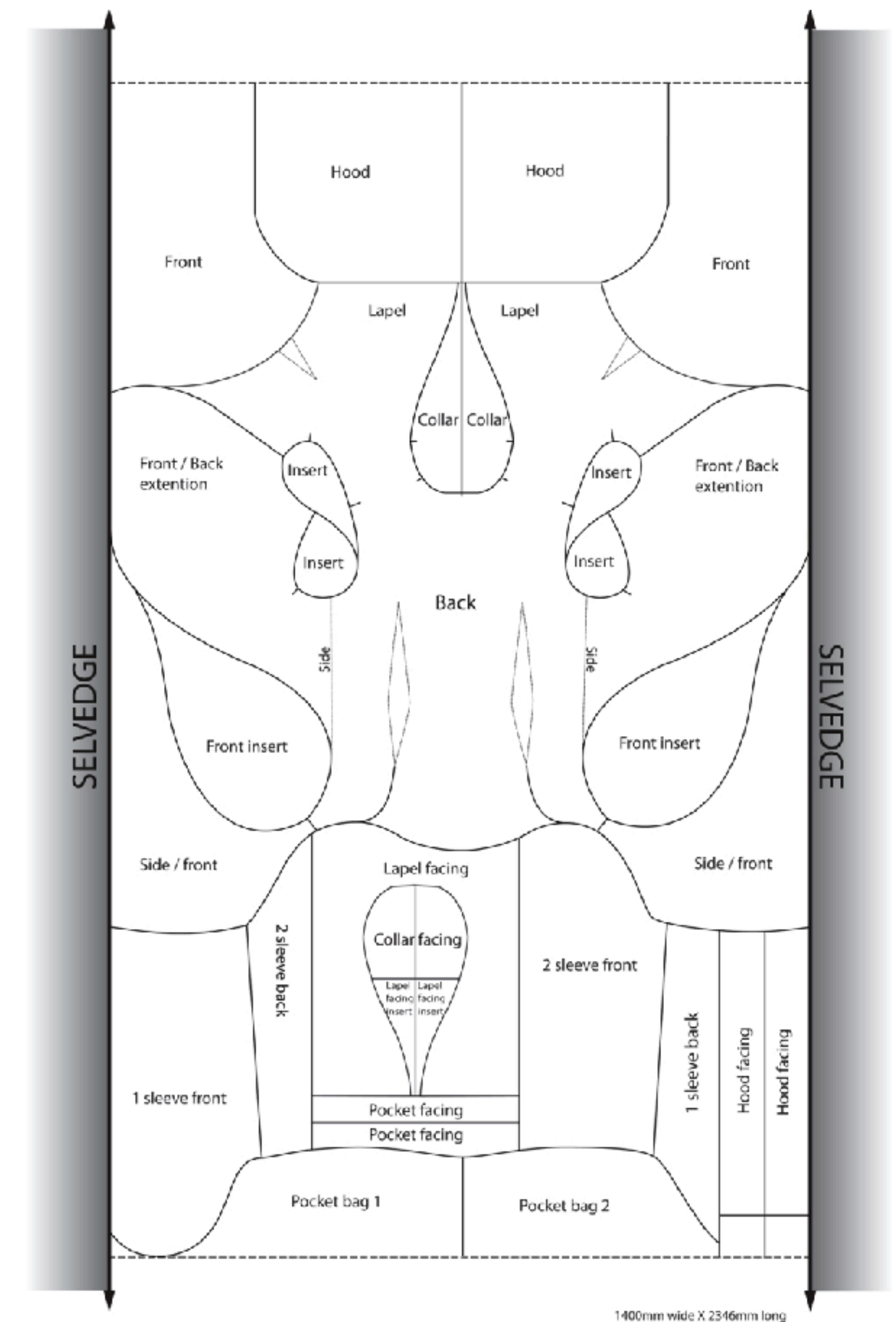
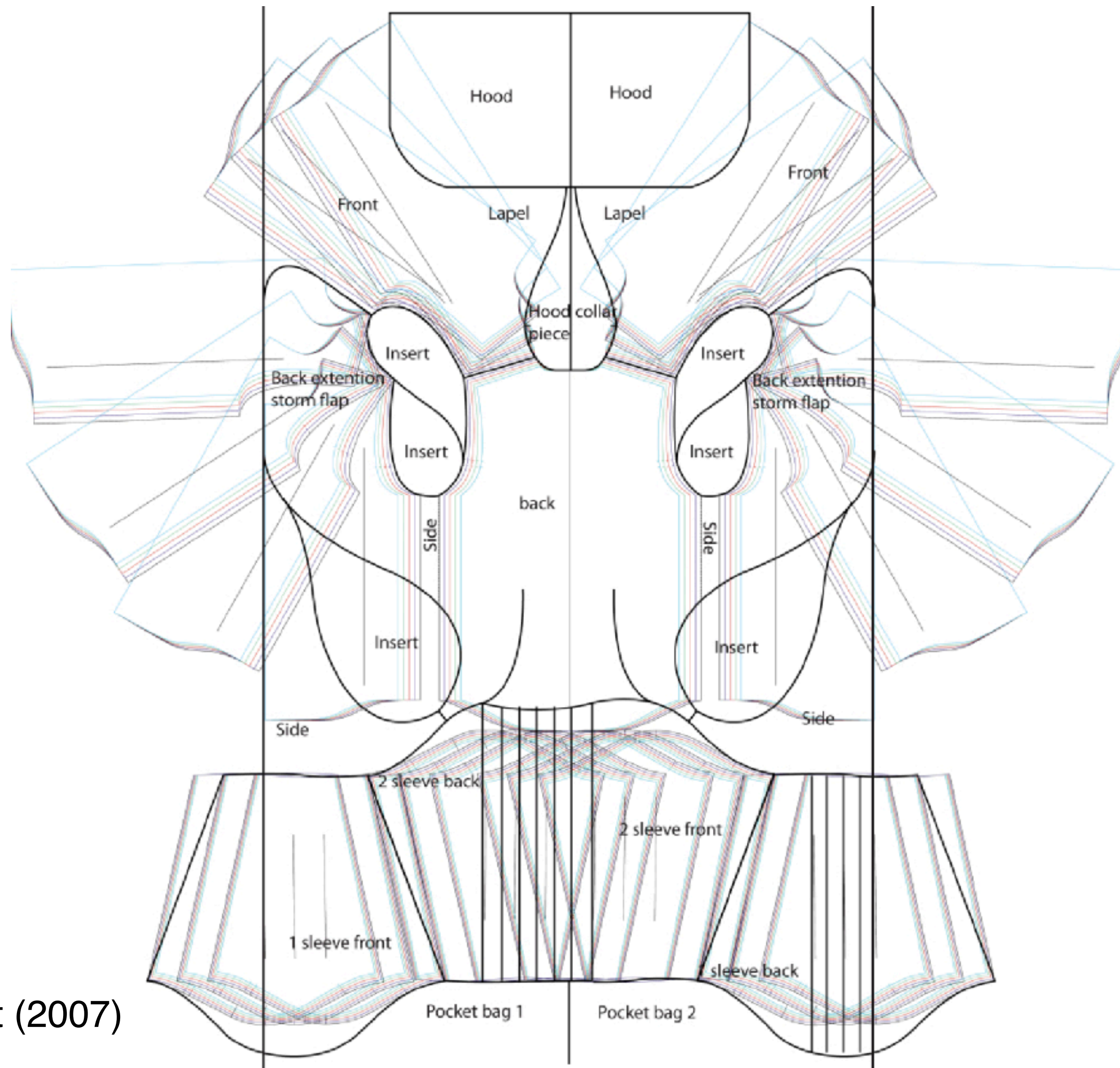
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<https://hollymcquillan.com>

PRECARIOUS CUT REVERSE ENGINEERED



Project: Precarious Cut (2007)

Holly McQuillan
 Designer, writer and zero waste advocate
<https://hollymcquillan.com>



Project: Precarious Cut (2007)

Holly McQuillan

Designer, writer and zero waste advocate

<https://hollymcquillan.com>

www.youtube.com/watch?v=ebjOdiis_ac



Holly McQuillan
Designer, writer and zero waste advocate
<https://hollymcquillan.com>

DESIGNER SPOTLIGHT: Dr. Mark Liu

„Zero-Waste Fashion Design is a way of creating garments where waste is designed out of a garment from the very beginning of the process. All the pattern pieces have a function and fit together like a jigsaw creating zero-waste. The designer must create a garment that can equal or surpass a traditional fashion garment without compromising the concept, fit or aesthetics.“

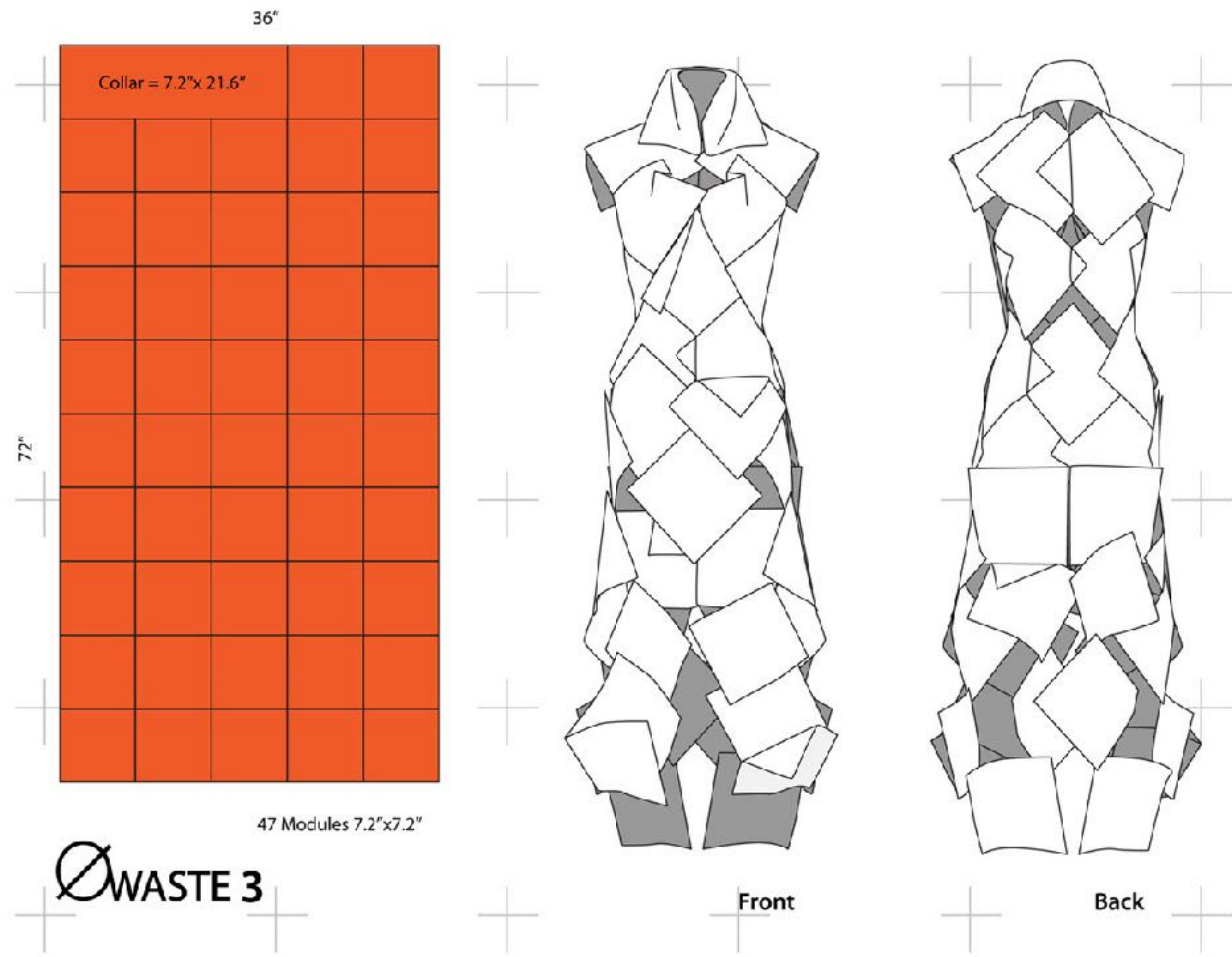


Dr. Mark Liu
PhD at University of Technology Sydney Australia
<http://www.drmarkliu.com>



Dr. Mark Liu
PhD at University of Technology Sidney Australia
<http://www.drmarkliu.com>

DESIGNER SPOTLIGHT: Carlos Villamil



Carlos Villamil
Fashion Designer and Professor at Wentworth Institute of Technology



DESIGNER SPOTLIGHT: Karin Vlug

ONE SQUARE FITS ALL

„My graduation collection “one square fits all” consists of 90° angles only, such as the square and the T-form. Sewing is not necessary, my pattern pieces contain tunnels and incisions, hence construction of the garment is possible by stringing together with a ribbon. For pants, only two pieces are required, for a shirt, dress, skirt, sweater or coat you will need one or more pieces. A complete wardrobe consists of ten pattern pieces. The placement of incisions and tunnels, and the materials I developed, are the essence of the design.“



Karin Vlug
Bachelor of Arts Fashion Design, ArtEZ, Arnhem, The Netherlands
<http://www.karinvlug.com>



Karin Vlug
Bachelor of Arts Fashion Design, ArtEZ, Arnhem, The Netherlands
<http://www.karinvlug.com>

DESIGNER SPOTLIGHT: Danielle Elsener



**TRADITIONAL
TEE SHIRT
PATTERN LAYOUT**

AROUND 15% WASTAGE



**ZERO WASTE
TEE SHIRT
PATTERN LAYOUT**

0% WASTAGE



DECODE
Danielle Elsener, Royal College of Art, London
<https://decode.design>



DECODE
 Danielle Elsener, Royal College of Art, London
<https://decode.design>

DESIGNER SPOTLIGHT: Natascha von Hirschhausen

„Wir produzieren unsere gesamte Kollektion mit weniger als 1 % Verschnitt, im Vergleich zu konventionellem Zuschnitt, bei dem etwa 20 % Material als Verschnitt abfällt.“

Natascha von Hirschhausen
Modedesignerin
<https://www.nataschavonhirschhausen.com>



**THE EARRING SHOWS ALL
LEFTOVERS OF THIS SUIT**



DESIGNER SPOTLIGHT: Julian Roberts

Subtraction Pattern Cutting

“This is a subtraction method of cutting, because the resulting shape is created by the removal of fabric, not the addition of fabric. This removal creates space for the body, but also controls how the fabric falls around the body.”

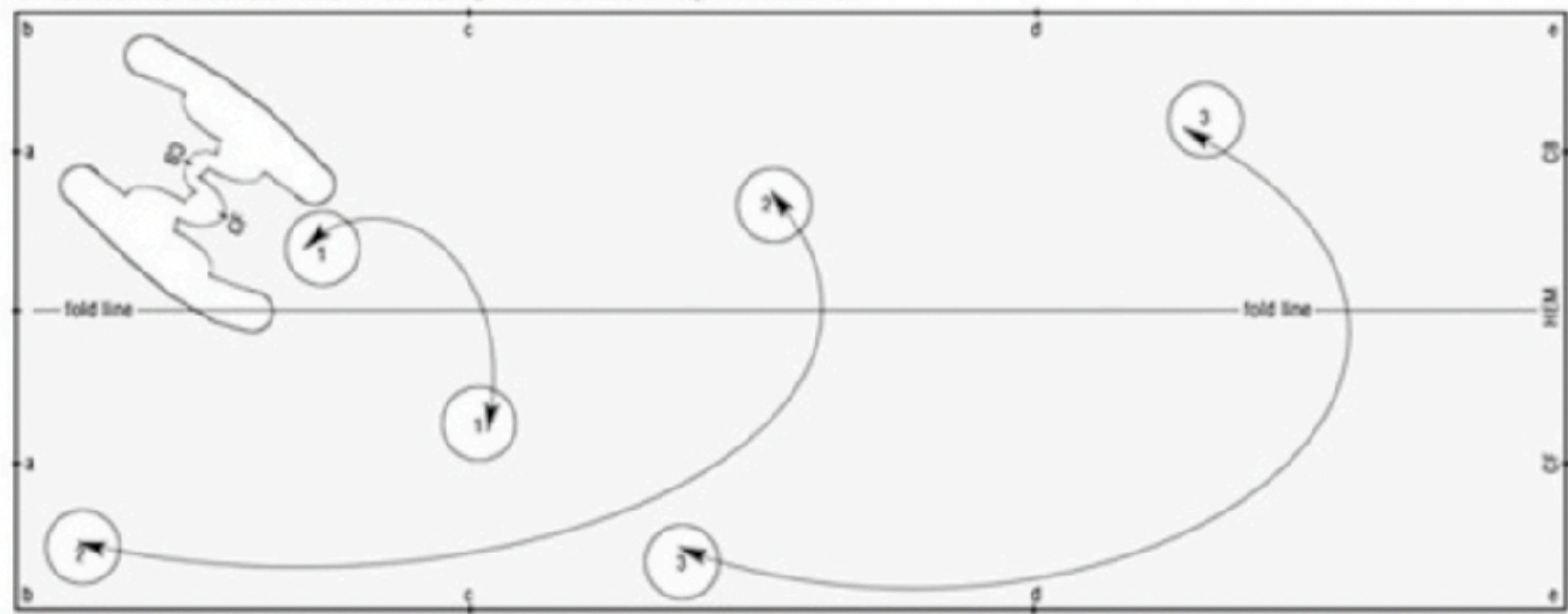


Julian Roberts
Designer and Lecturer
<https://www.thecuttingclass.com/subtraction-pattern-cutting-with-julian-roberts/>



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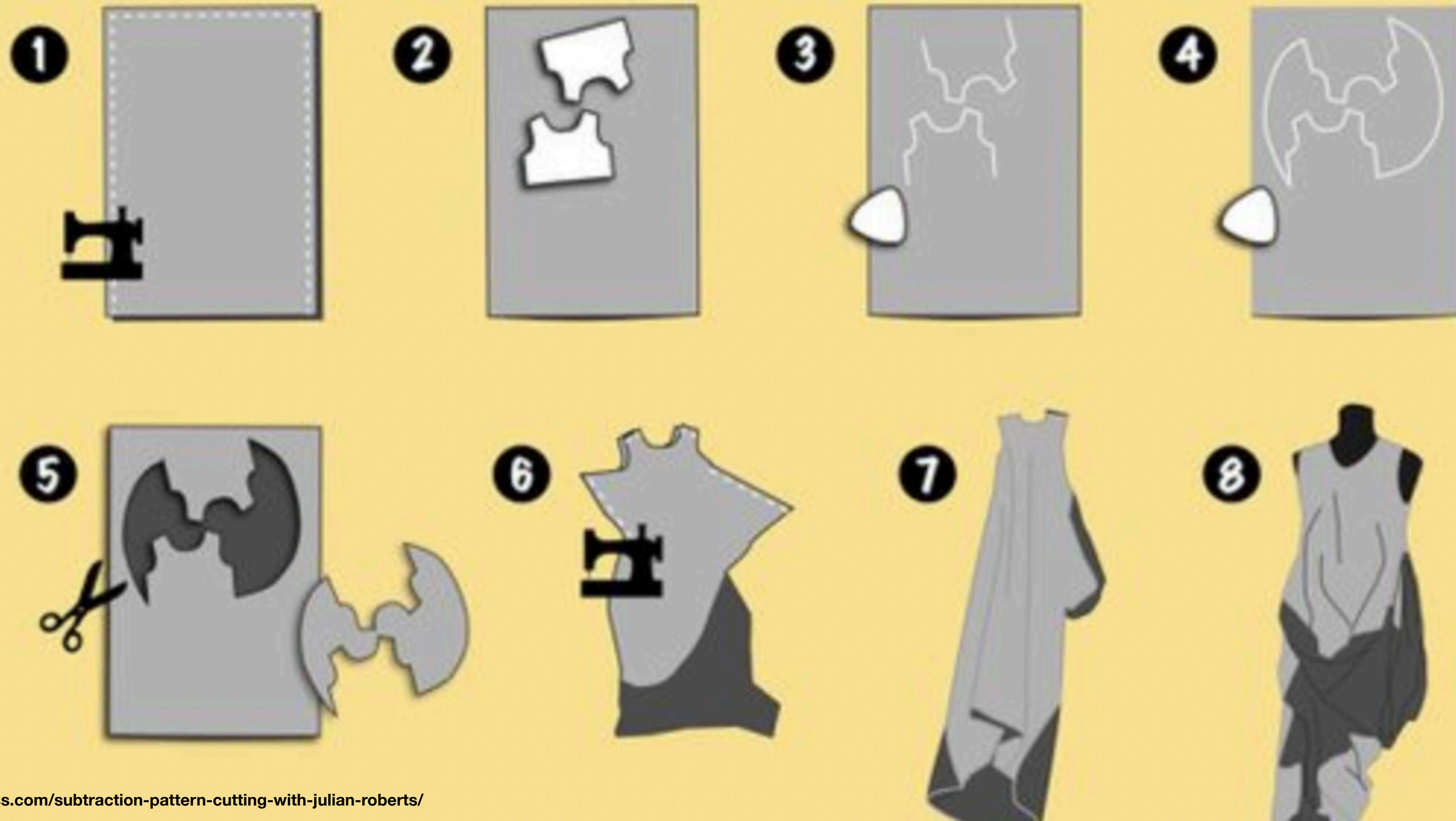
B HOLE SUBTRACTION DRESS PATTERN - Cut at Liverpool John Moores University, 13th March 2008.



Julian Roberts
Designer and Lecturer
<https://www.thecuttingclass.com/subtraction-pattern-cutting-with-julian-roberts/>

JULIAN ROBERTS SUBTRACTION CUTTING

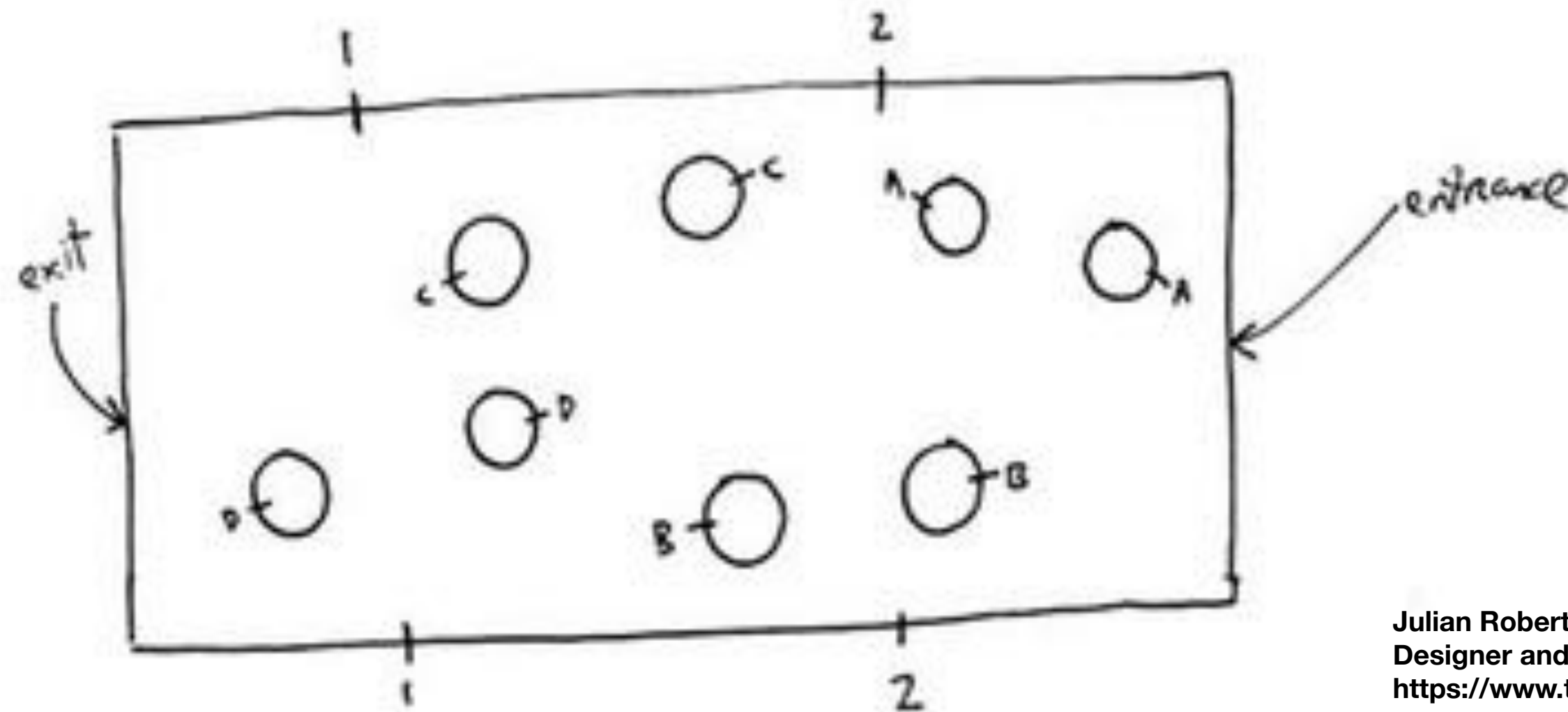
TUTORIAL BY NEEDLE AND TED



Julian Roberts
Designer and Lecturer
<https://www.thecuttingclass.com/subtraction-pattern-cutting-with-julian-roberts/>



The effect of this
is to twist the
original tube horizontally
around the core,
meaning that the back &
the front of the tube
rotates around the body.
The pattern might look something
like this:



Julian Roberts
Designer and Lecturer
<https://www.thecuttingclass.com/subtraction-pattern-cutting-with-julian-roberts/>

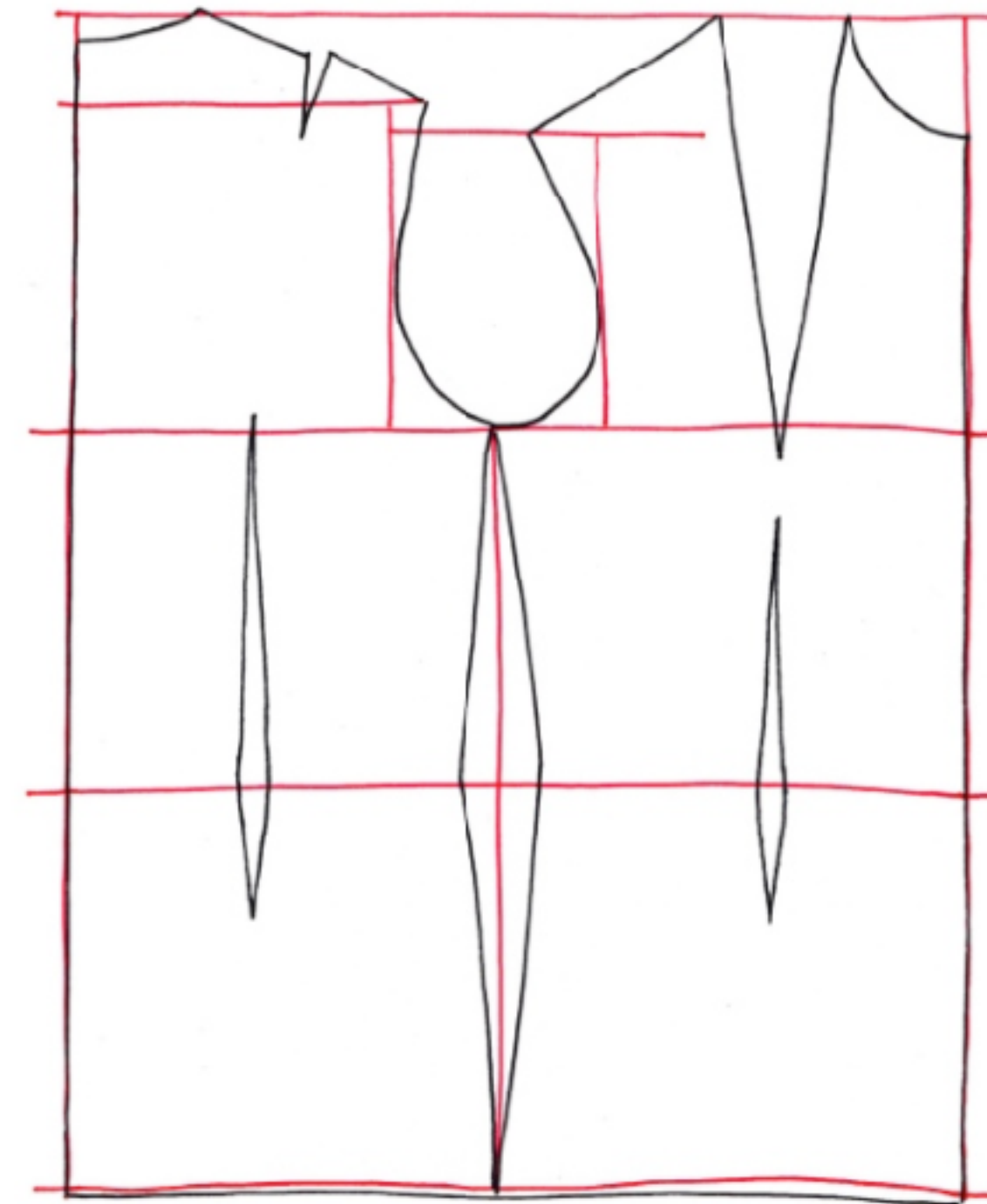
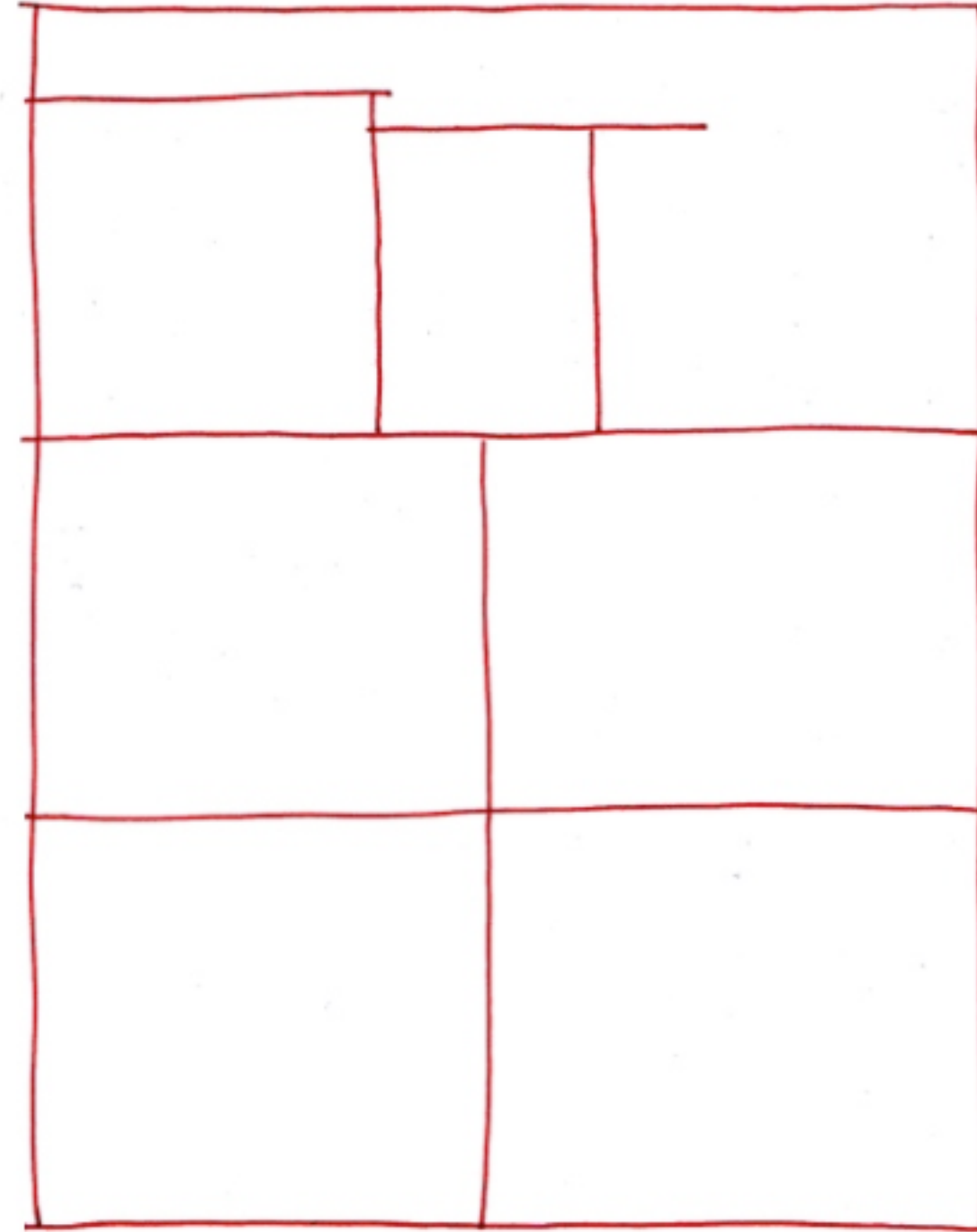


DESIGNER SPOTLIGHT: Dr. Rickard Lindqvist

„Lindqvist eventually came up with a system that he calls \"Kinetic Method\" and that is based on an approximation of the body visualized through balance lines as well as key biomechanical points. According to this method, garment construction starts from the structure of the body and the material qualities of the fabric and the model is developed through concrete experiments using the cutting and modeling of fabrics on living models. In this way Lindqvist suggests alternative solutions to improve the functionality of the garments that protect our bodies.“

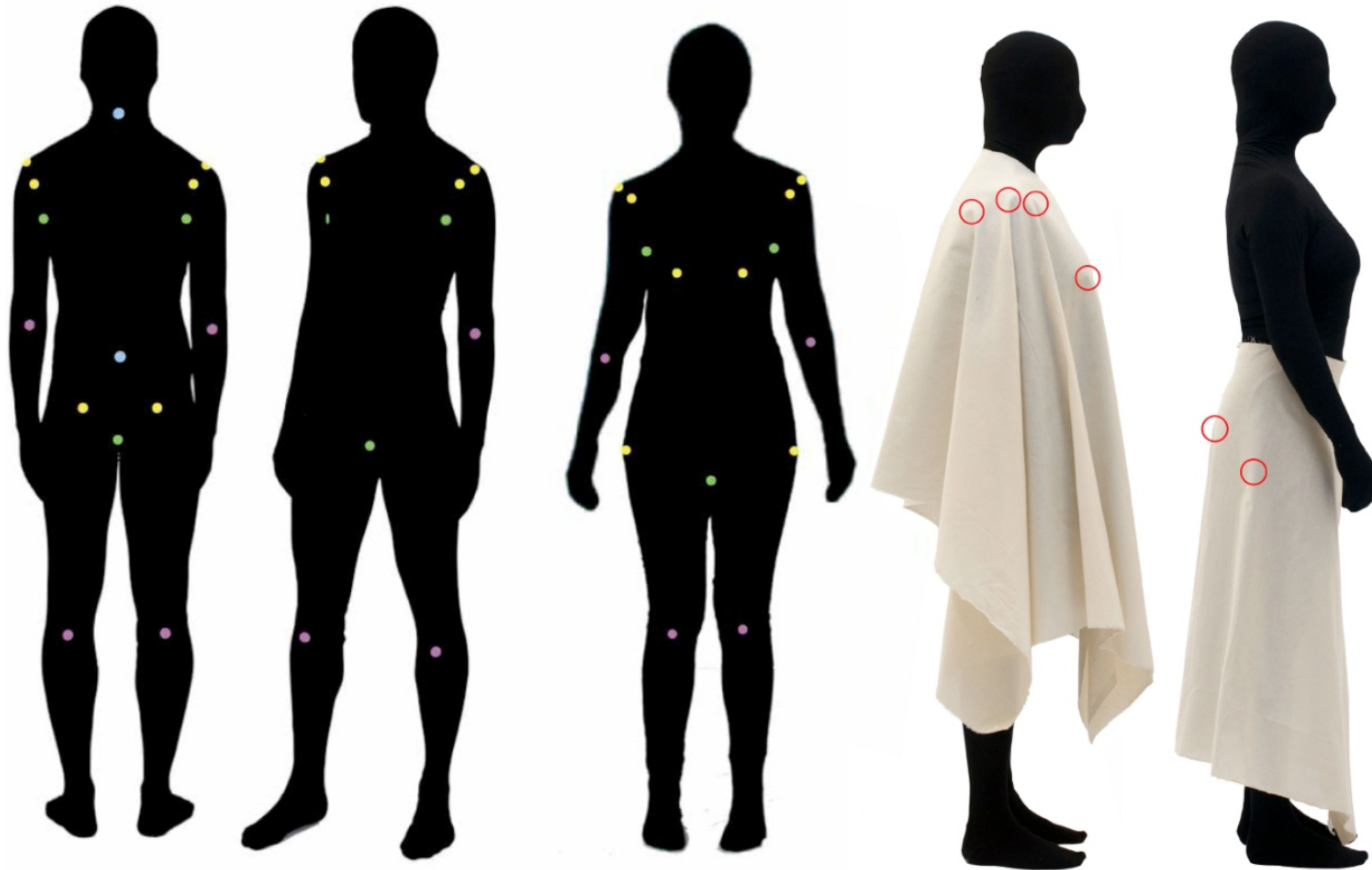
Dr. Rickard Lindqvist
PhD The Swedish School of Textiles

The standard pattern



Dr. Rickard Lindqvist
PhD The Swedish School of Textiles

The kinetic pattern



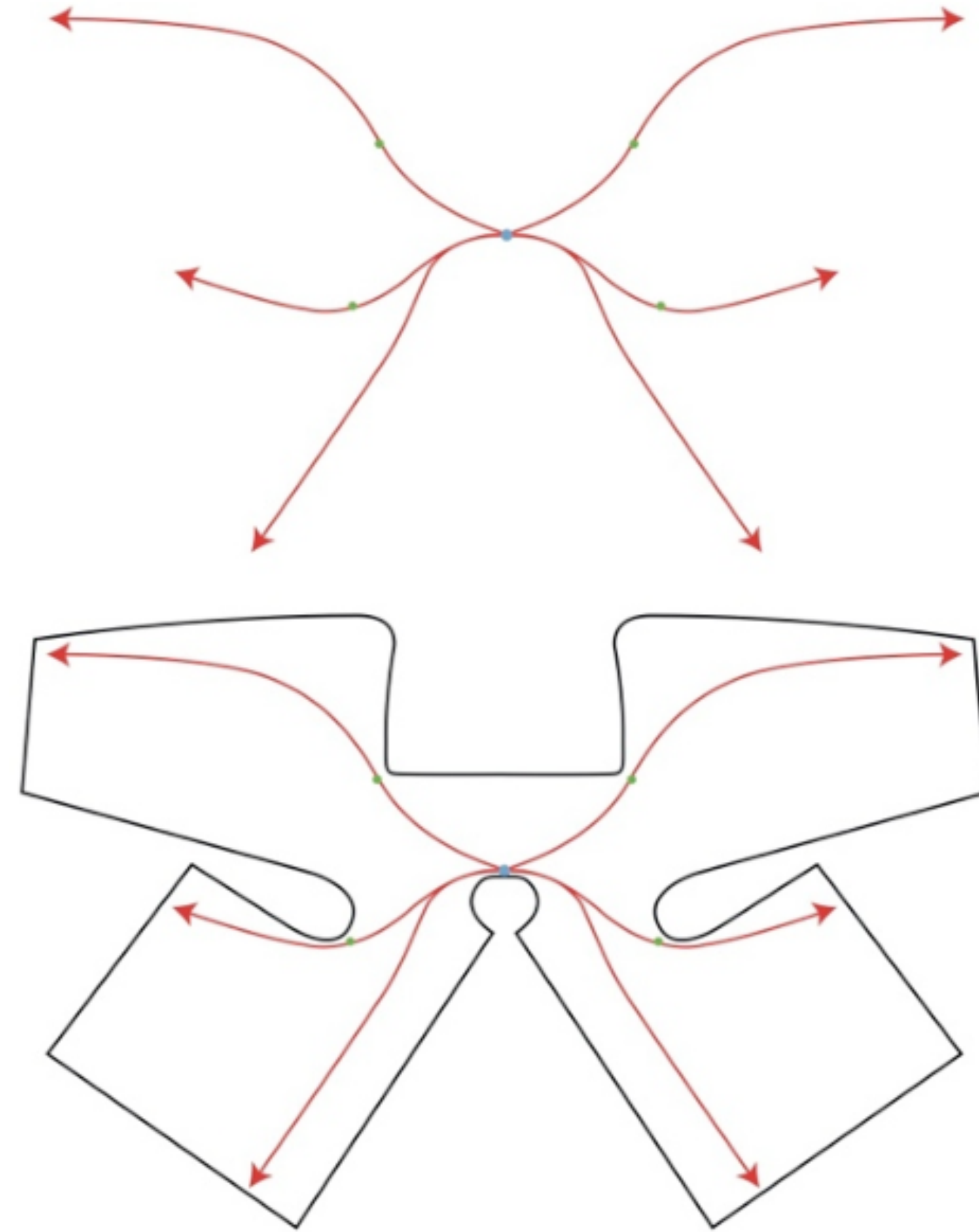
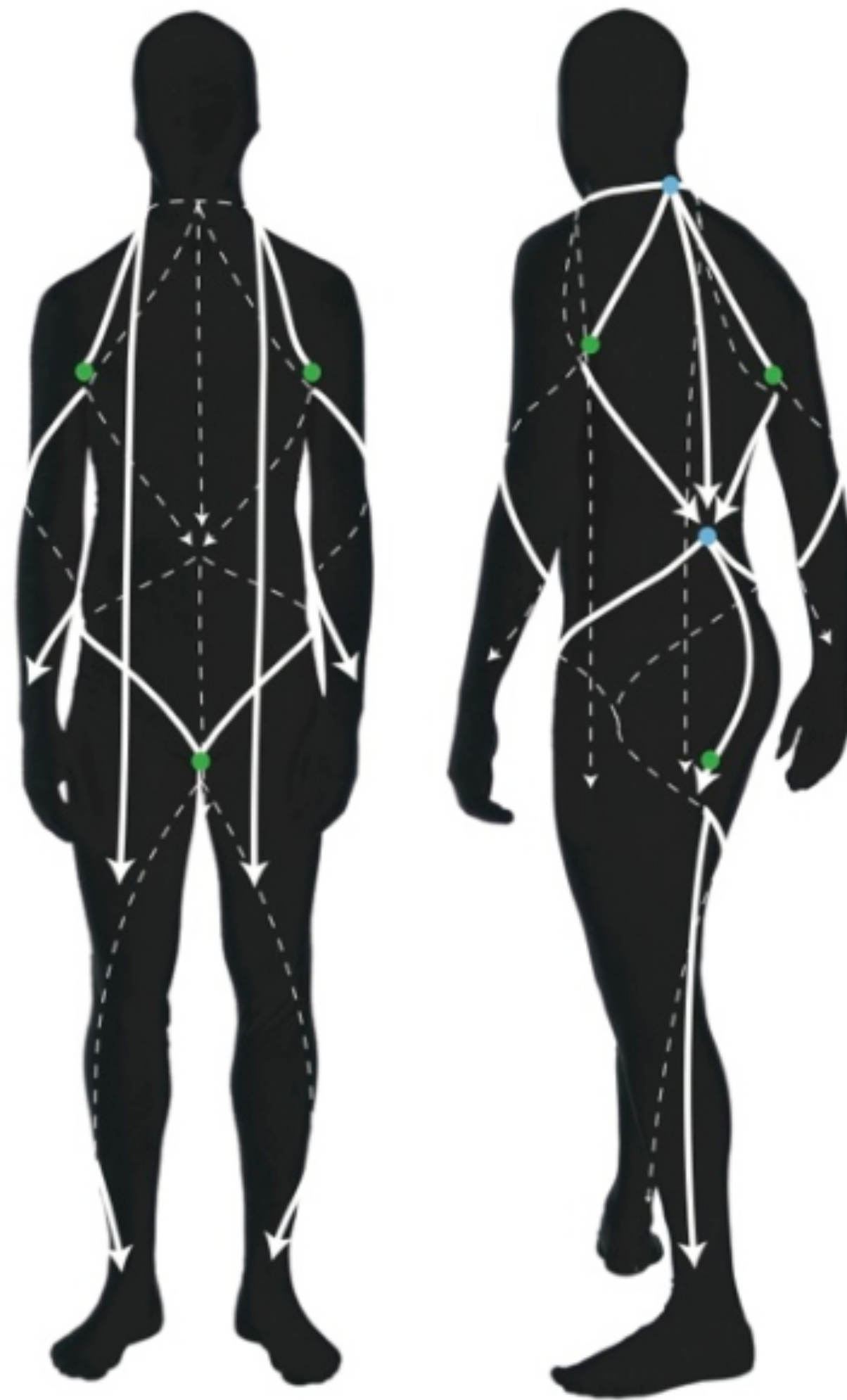
Dr. Rickard Lindqvist
PhD The Swedish School of Textiles



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The kinetic pattern



Dr. Rickard Lindqvist
PhD The Swedish School of Textiles

The standard pattern



The kinetic pattern



DESIGNER SPOTLIGHT: ISSEY MIYAKE



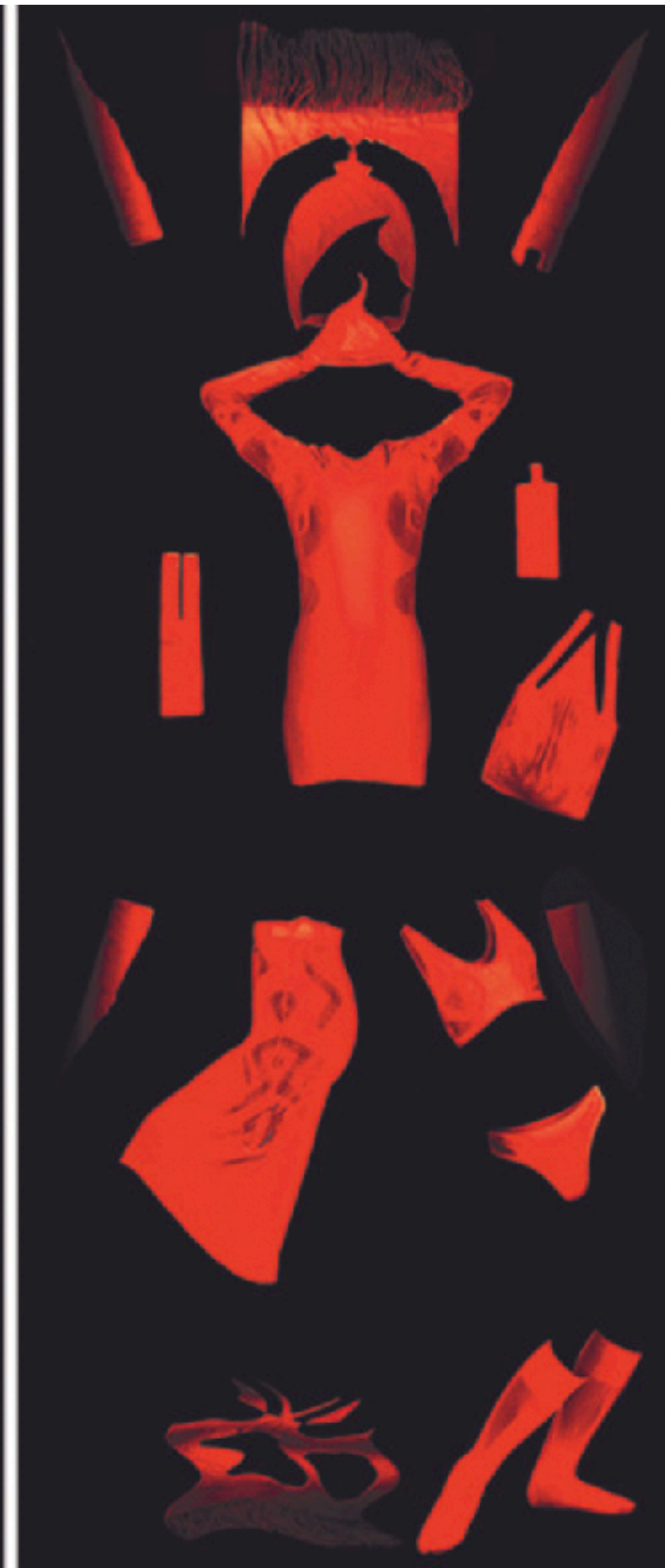
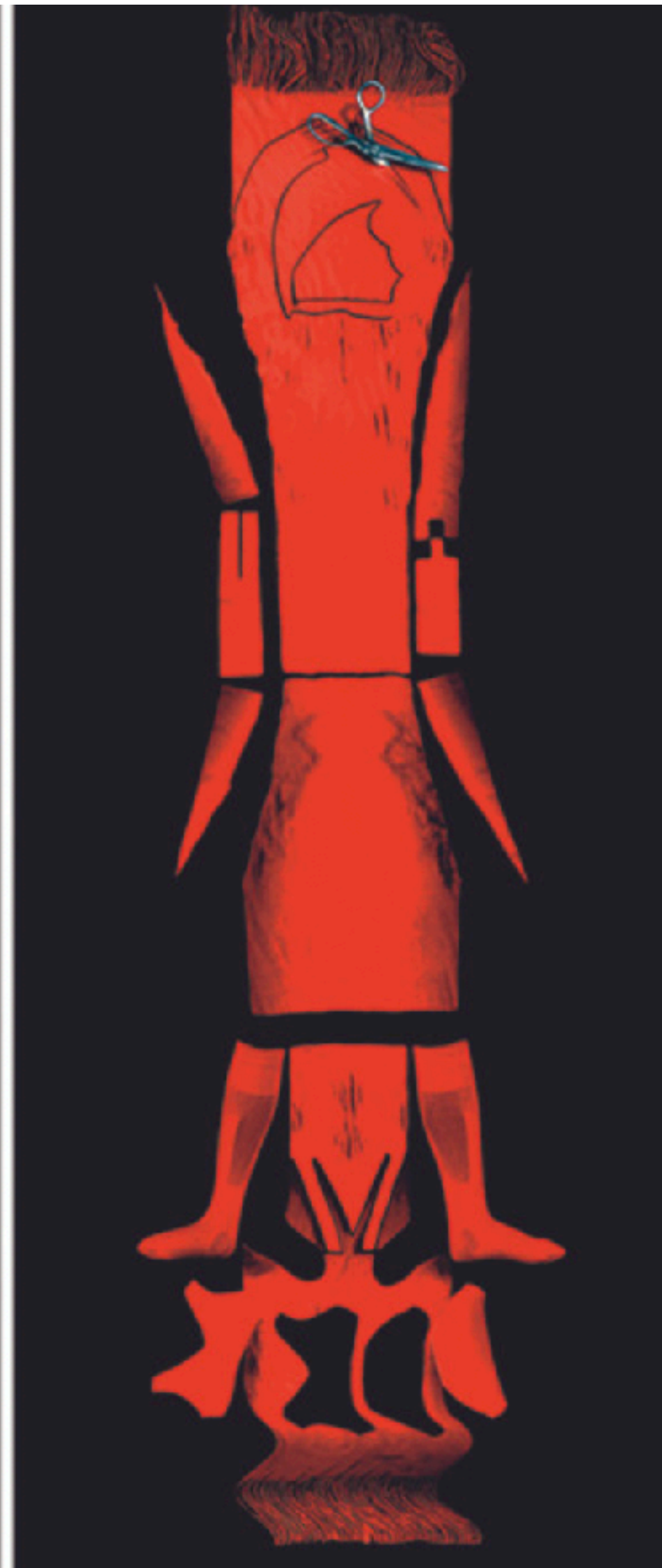
„Miyake and Fujiwara's A–POC (A Piece of Clothing) is an innovative outfitting system that produces selftailored clothing through mass production, a marriage of systems that seem inherently at odds. An industrial weaving machine is preprogrammed to spin an enormous, continuous tube of fabric. A repeating pattern of seams is woven into the tube, creating a patchwork of shapes whose outlines begin to suggest dresses, shirts, socks, gloves, and hats. The customer can cut along the seams without destroying the tubular structure of each individual item. The result is a puzzle of monochromatic articles of clothing that leaves behind virtually no wasted material.

Each item is designed to be slightly oversized when cut from the roll, allowing users to further customize their garments with scissors—sleeve length, bias, and neckline are just a few of the possibilities. By making the wearer the ultimate designer of the outfit, Miyake and Fujiwara's rapid, efficient, and infinitely customizable system pushes conventional textile technology and creates everyday clothing that transcends ephemeral fashion trends.“

Publication excerpt from The Museum of Modern Art, *MoMA Highlights since 1980*, New York: The Museum of Modern Art, 2007, p. 180.



Issey Miyake A-POC





Issey Miyake A-POC



Issey Miyake RTW 1997

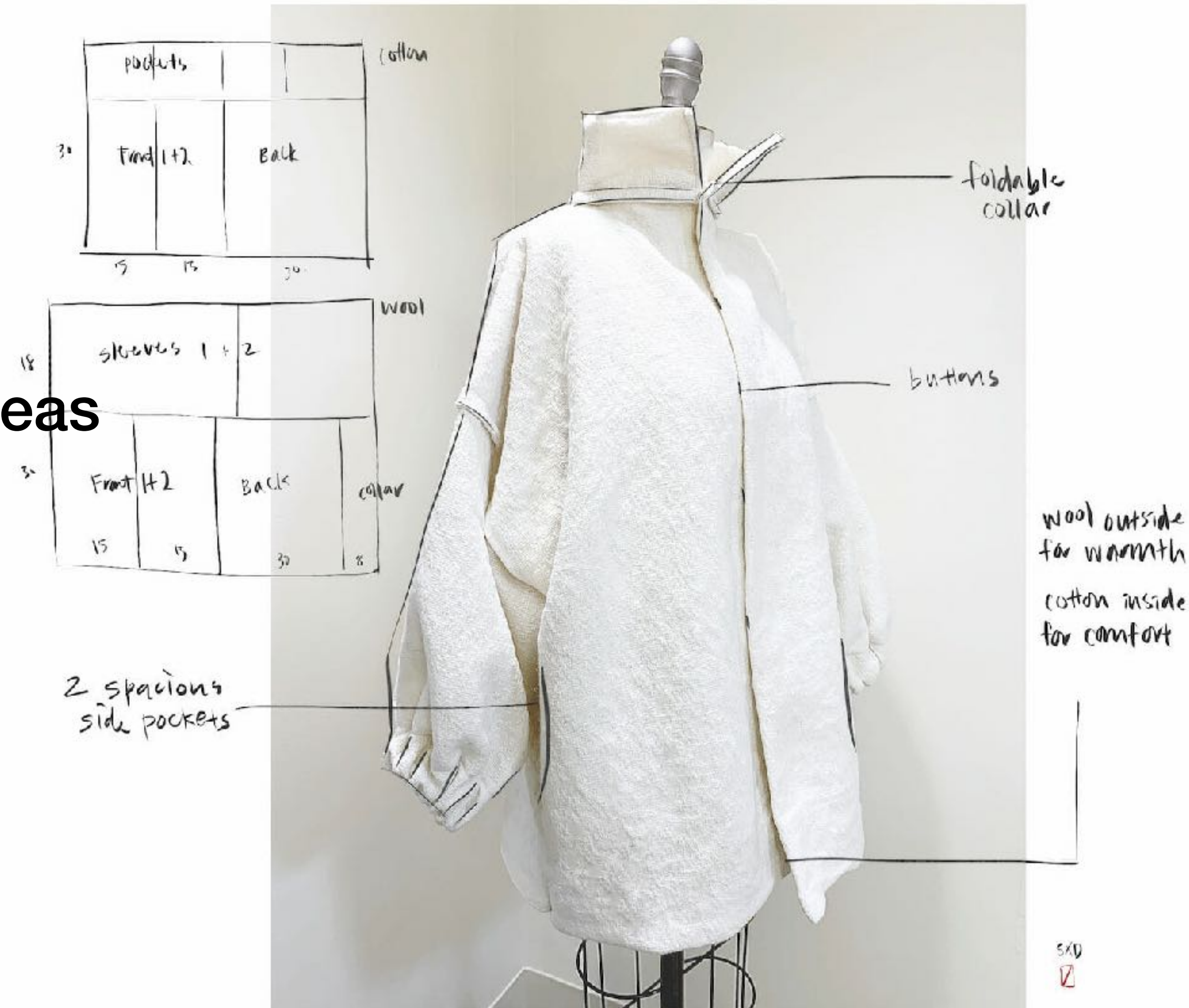


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WHAT TO DO NOW?

ZERO-WASTE-PROCESS: Rules & Ideas



Shelly Xu, Founder of SXD
<https://designmuseumfoundation.org/creativity-under-constraint/>

RULE ONE: Von Groß nach Klein

“Essentially, I’m going from the largest pieces to smallest as the design process progresses.”

Timo Rissanen
Professor at the University of Technology Sidney, Australia

Passen oder Passenelemente können zusammengeñäht werden um so auch kleinere Stoffstücke zu verwenden. Schrägstreifen können auch aus kleinen Stoffresten zusammengeñäht werden, statt aus neuen Stoffbahnen. Futter können z.B. aus den Stoffresten eines anderen Projekts oder Stoffes zugeschnitten werden.

RULE TWO: So wenig schneiden wie möglich.

Beim Zero-Waste-Design können Formnähte durch Abnäher und Falten ersetzt werden. Oder die entstandene Mehrweite wird angenommen und neu interpretiert, so dass die Seitennähte zu geraden Linien werden dürfen. Auf diese Weise liegen die Schnittmusterteile bündig aneinander und kein Stoff wird zwischen den Schnittteilen verschwendet.

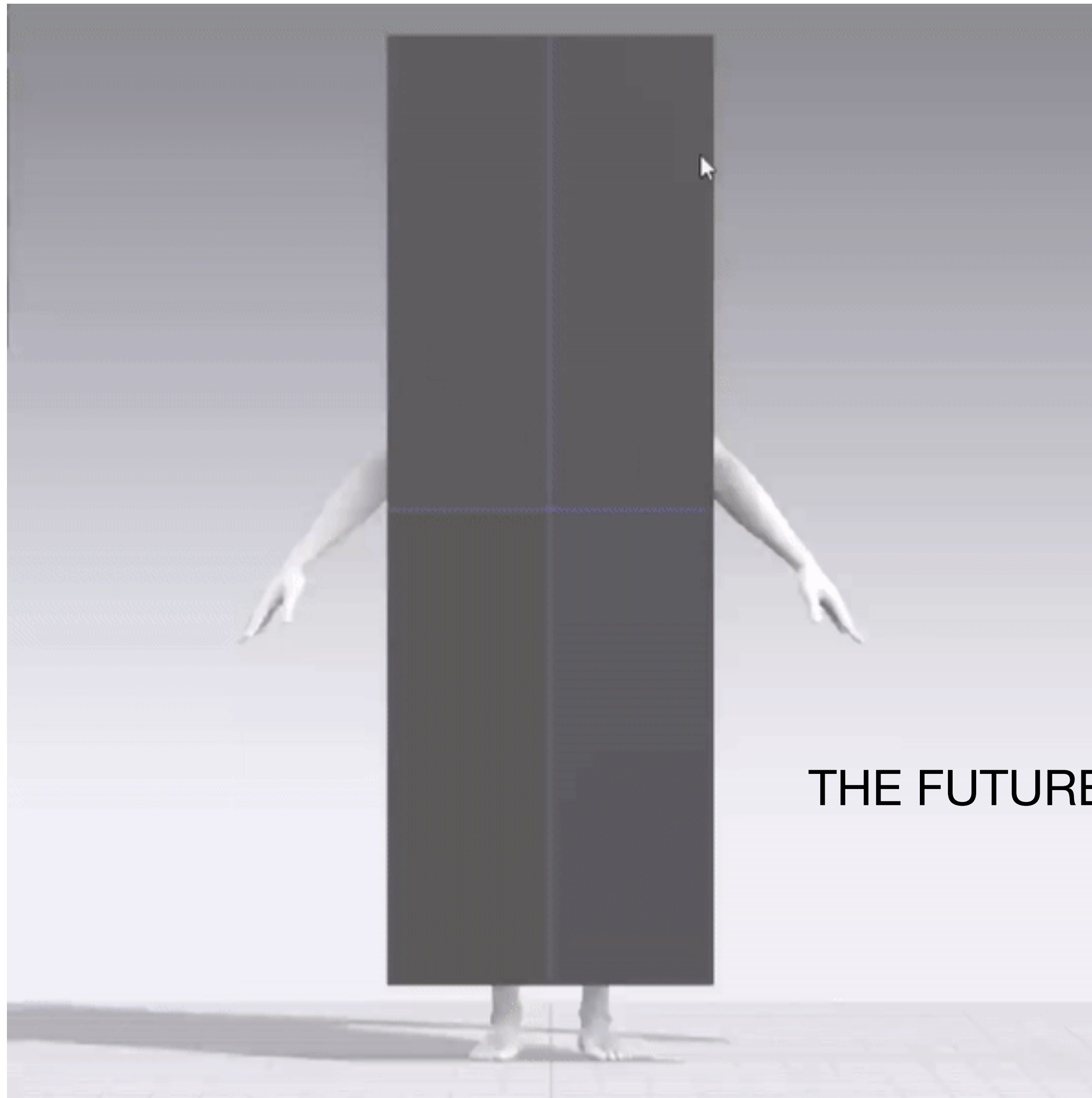
Stark veränderte Nahtführung und Fadenläufen verändert das Aussehen des endgültigen Kleidungsstücks natürlich sehr, aber so können auch neue Ideen für Volumen und Passform entstehen.

RULE THREE: Die Stoffbreite bestimmt das Design.

Zero-Waste-Design beginnt immer mit der Stoffbreite. Die Breite des Stoffes ist der entscheidende Faktor beim Zero-Waste-Design. Ohne die Breite des Stoffes im Voraus zu kennen, kann ein abfallfreies Kleidungsstück weder entworfen noch hergestellt werden. Anstelle der traditionellen Skizze beeinflusst nun also der Schnittmusterprozess selbst das Kleidungsdesign. Der Zuschnitt ist somit der wichtigste Faktor für das Design.

RULE FOUR: Ein Schnittmuster = eine Größe

Konventionelle Methoden das Schnittmuster zu gradieren sind im Zero-Waste-Design nicht möglich. Es gibt keinen Raum um Schnitteile zu vergrößern, da jeder Zentimeter der Stoffbreite ausgenutzt wird. Typischerweise werden Schnittmuster auch mehr in der Breite als in der Länge gradiert. Dies ist beim Zero-Waste-Design nicht möglich, da die Schnittmusterteile fest ineinandergreifen. Eine Drehung des Schnittbildes würde zwar ein Wachstum in Längsrichtung des Stoffes ermöglichen, doch würde sich dadurch der Fadenlauf der Schnittmusterteile ändern, was wiederum Fall und Gesamtbild des Kleidungsstücks verändert. Eine alternative Methode ist die Verwendung von geometrischen Einsätzen z.B. (dekorativ als Spitze) um verschiedene Größen zu kreieren.



THE FUTURE OF ZERO-WASTE-DESIGN?



Le Ngoc Ha Thu, Redress Design Award 2020 winner, created this shirt by deconstructing a yukata and developing a zero-waste pattern with CLO-3D.



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