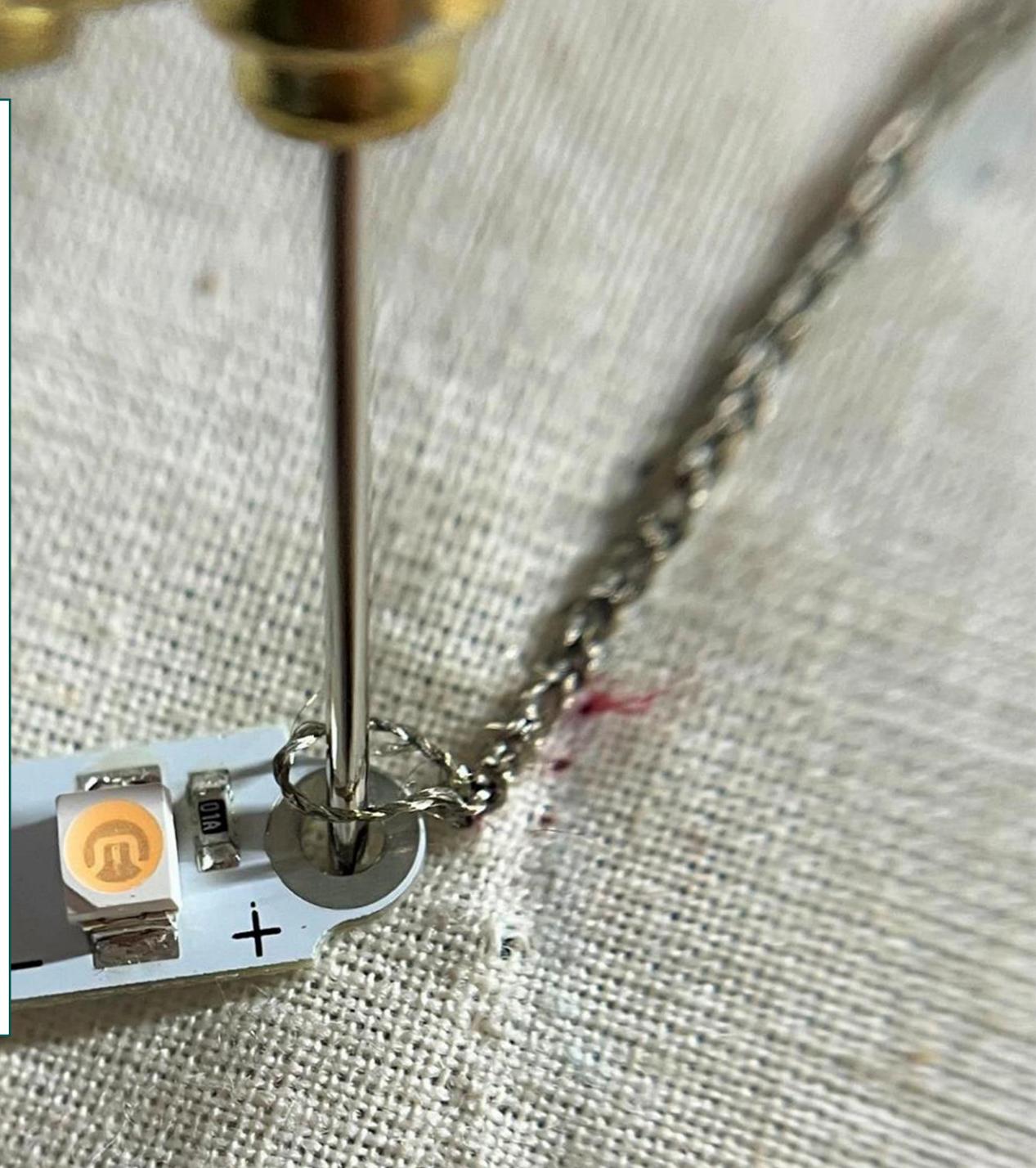


E-textile futures & textiles past: Seeking solutions from history

Dr Amy Chen

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Content

- Background
- Research interest
- Research through textile design perspective
- Disappearing Stitch project
- Current creative practice

Background

Education

- BA in Textile Design
- MA in Fashion Innovation
- PhD in Knitted E-textile Design

Experience

- Lecturer at University of Huddersfield (2021-2023)
- Present: Freelance Artist and Educator

Research Interests

- Sensing and Illuminating e-textiles



Joyous Ocean Sensory Wall

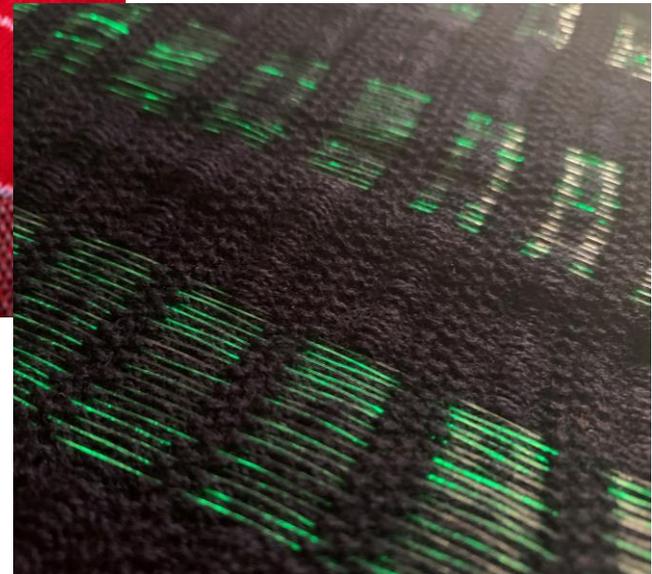
Research Interests

- Knit structures and technologies
- Sustainable approaches in e-textile design



Dance Lion Cushion

Inlay optical fibre knit



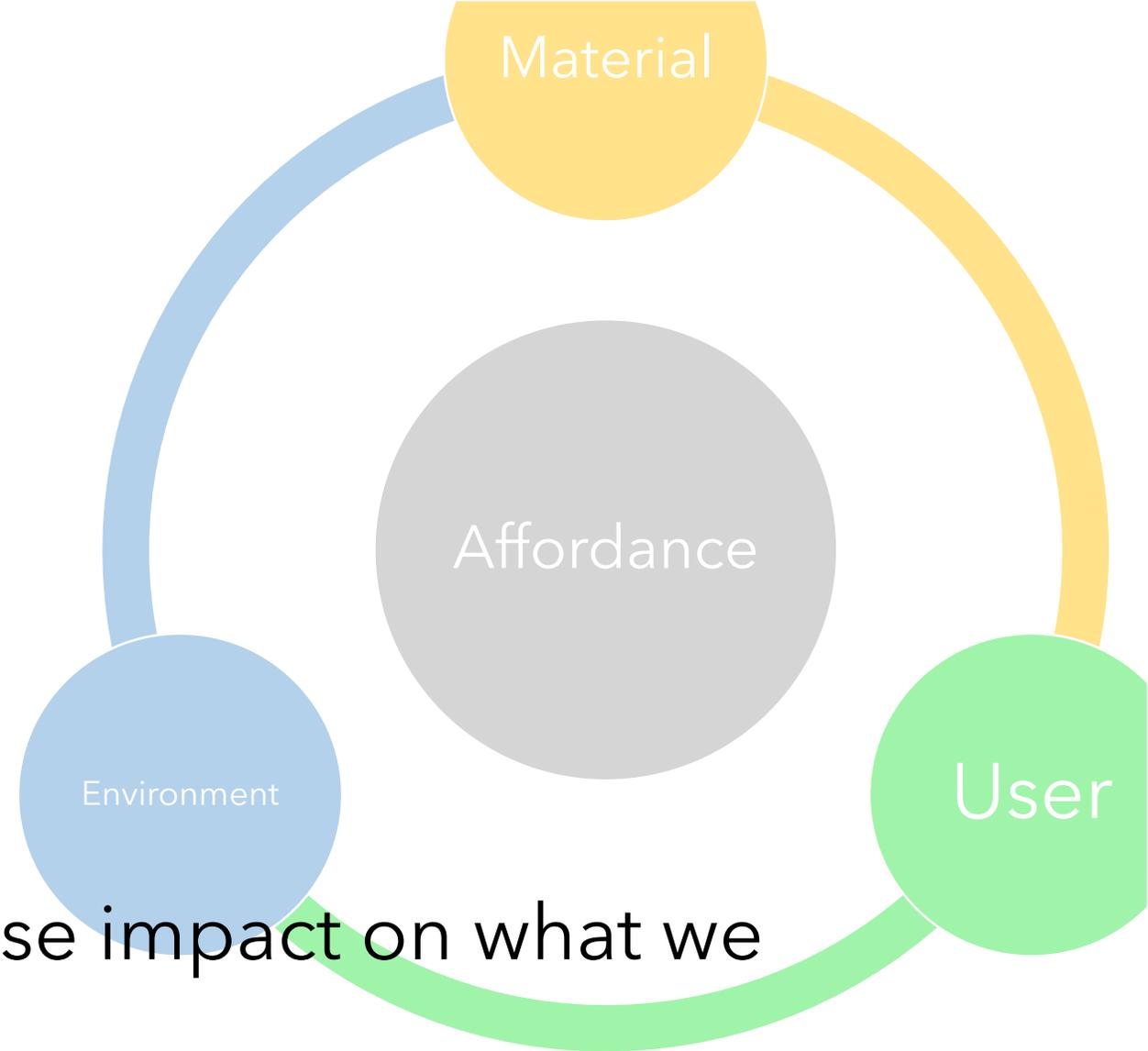


Research perspective informed by textiles design practice

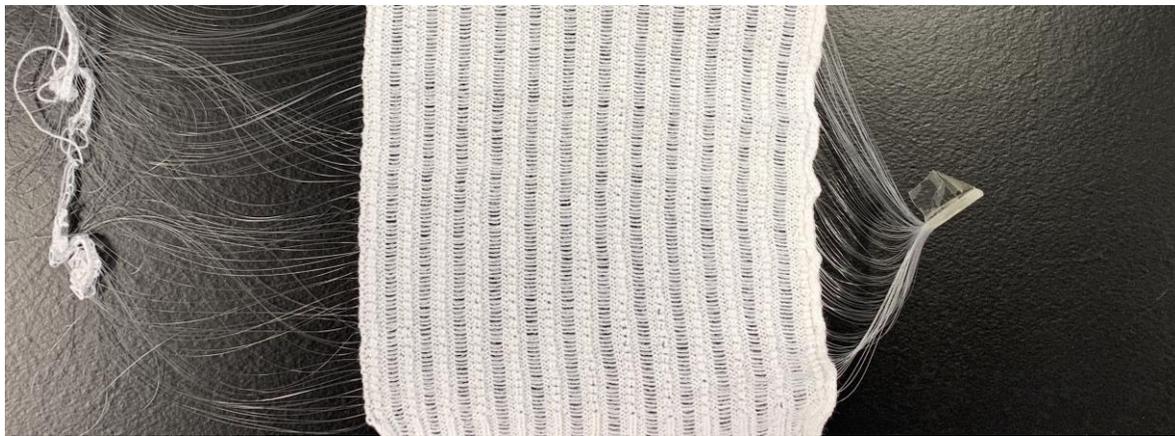
Tacit knowledge developed through material
manipulation

Affordance

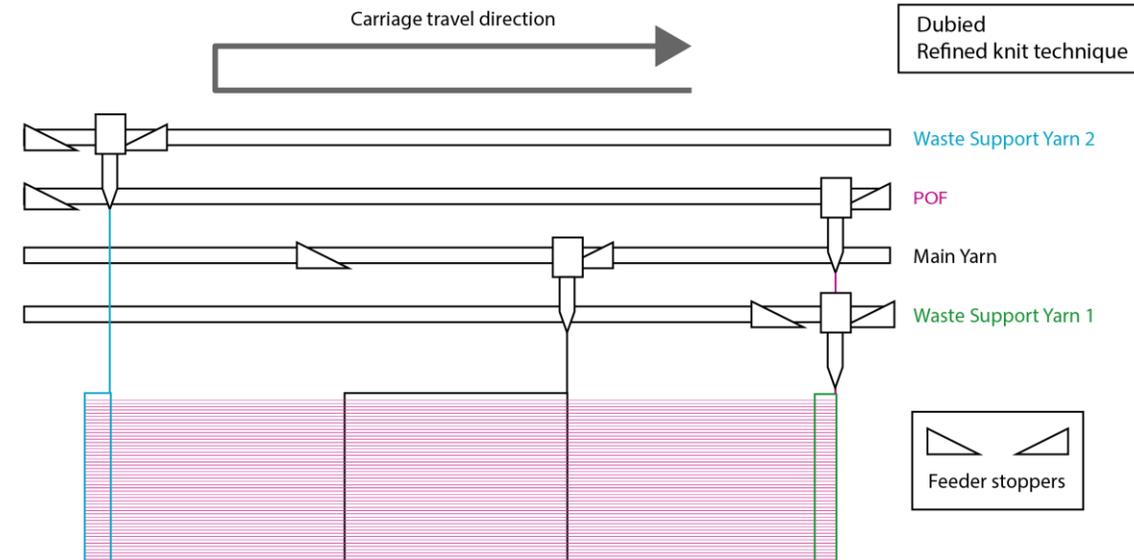
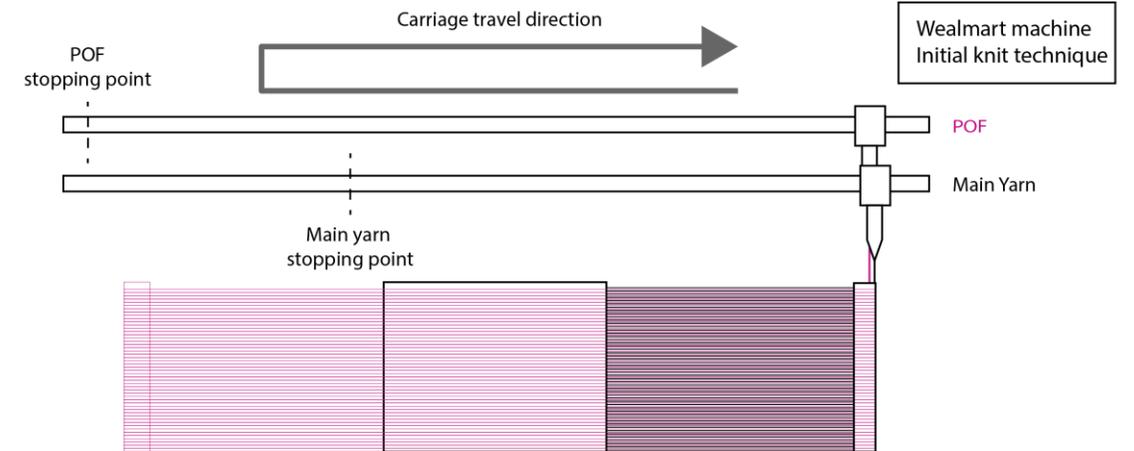
The tools and materials we use impact on what we design



Better technology equals more capability?



Knitted optical fibre structure development



New materials
enable new
functions but may
not work within
current textile
practices



Knitting fibre optics on a Shima Seiki knitting machine

Considering textiles production technology on a spectrum

Manual Intervention



Tactile Feedback



Design Complexity



Automation

Hand craft

Hand operated machines

Computer operated machines



Older technology
can allow more
innovative design
exploration

Sustainable practices may
not fit within the existing
textiles production
ecosystem

Wu, S. and L. Devendorf (2020). Unfabricate: Designing Smart Textiles for Disassembly. Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems. Honolulu, HI, USA, Association for Computing Machinery: 1-14.

Looking more widely at textiles production technology

Exploring overlooked
techniques and technologies



Cornelly Embroidery Machine (Image courtesy of Elnaz Yazdani)



Disappearing Stitch Project

- Exploring e-textiles design for disassembly (DfD)
- Leveraging a 'disadvantage' of chainstitch - it can unravel freely

Chen, A. (2023). Disappearing Stitch: Exploring e-textiles design for disassembly. The 12 International Conference on Design and Semantics of Form and Movement (DesForM), Hong Kong S.A.R., 5-7 July 2023

Disassembly in fashion and textiles

Clothing attachment techniques are designed to be permanent.

Disassembling and recycling existing garments is time-consuming and inefficient.

Existing solutions to fashion and textiles disassembly

- Dissolvable threads using radiation
 - Durham et al.,(2014);
Resortecs, (2022)
- Interlocking attachment style
 - Forst (2020); Mattocks (2022)



*Ochre Leather Saddle Bag -
Lee Mattocks (2022)*

Disassembly in E-textiles



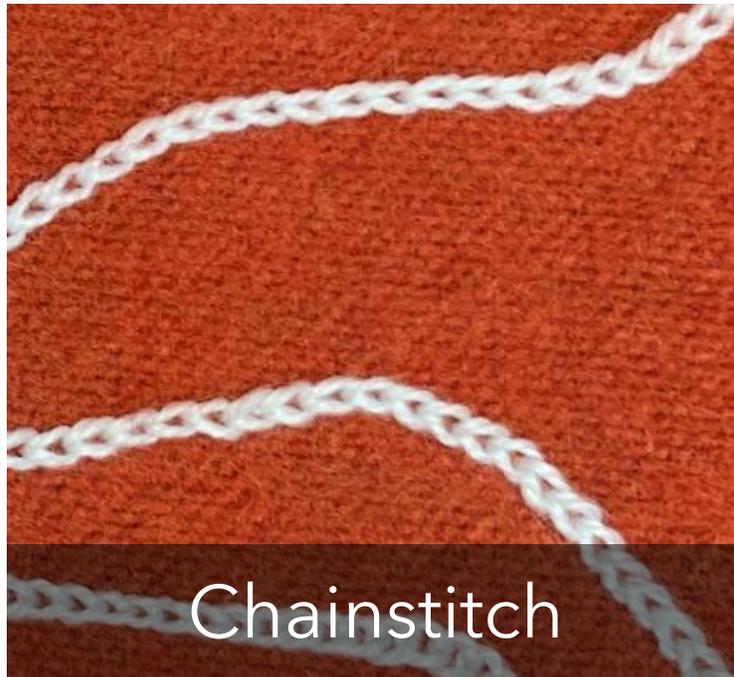
Punch-Sketching E-textiles...- Jones et al., (2021)

- Delamination
 - Veske et al., (2019); Klamka et al., (2020)
- Punch needling
 - (Jones et al., 2021)
- Designing for woven e-textiles for disassembly
 - Wu and Devendorf (2020)



Moss stitch

Too insecure



Chainstitch

Balance of security and
removability



Lockstitch

Too difficult to remove

Experimenting with removable stitch

Design inquiry: chainstitch for e-textiles

- Using a **series of sensitising activities** to identify areas of opportunity and concern

Key considerations:

1. Attaching rigid electronics
2. Designing for disassembly
3. Designing for maximum material recovery

Attaching rigid electronics

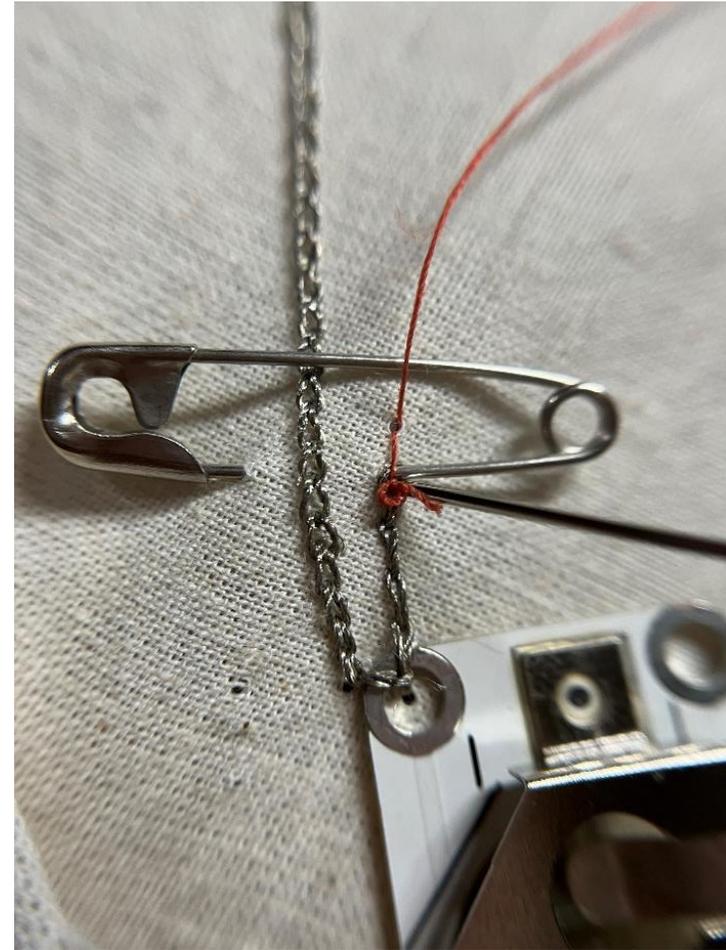


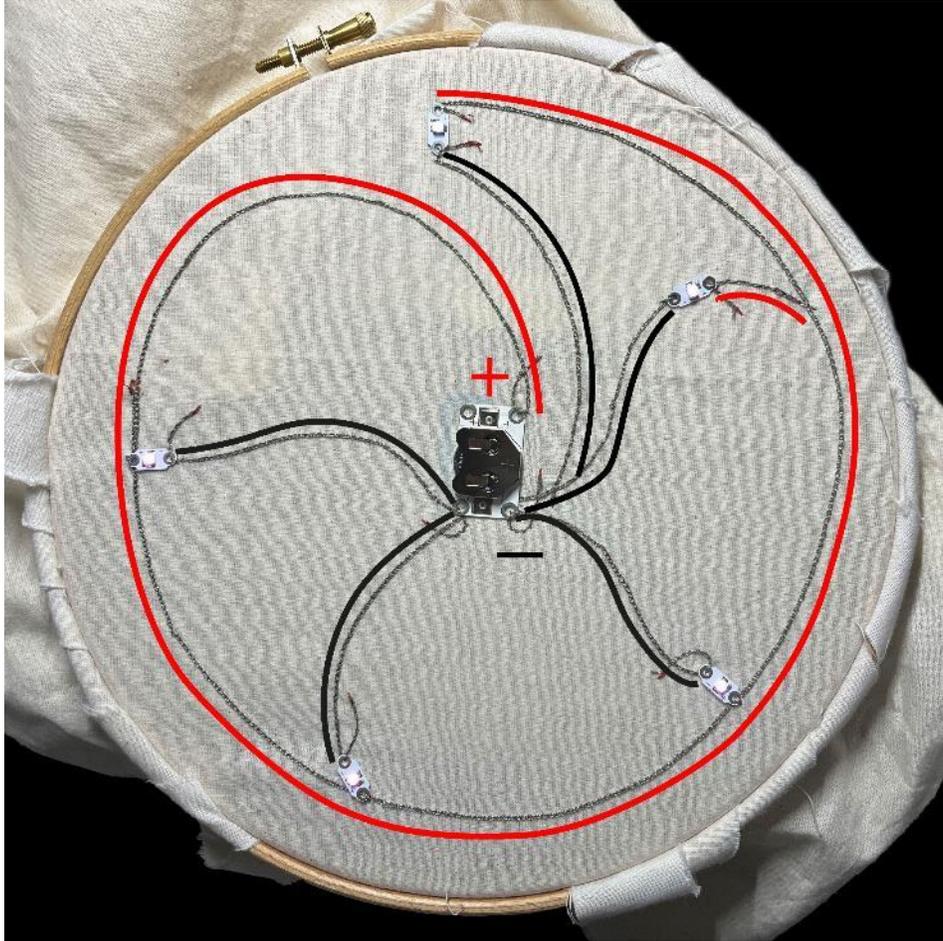
Using the machine for most of the circuitry

Hand stitch to attach electronic components

Designing for disassembly

Contrasting stitch to indicate the end of a chainstitch

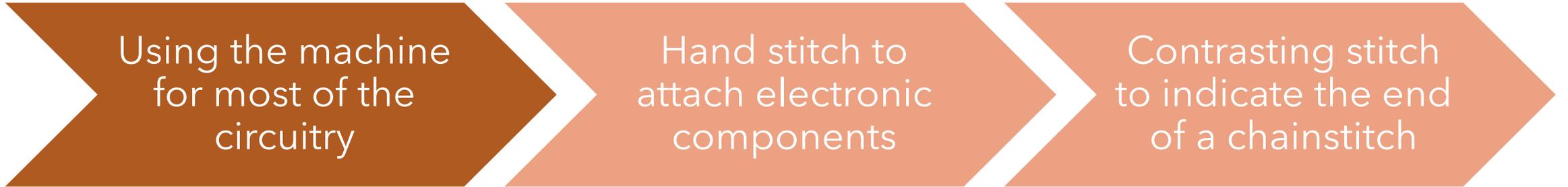




Designing for maximum material recovery

The circuit needs to be designed to minimise the number of short conductive stitching sections

Assembly



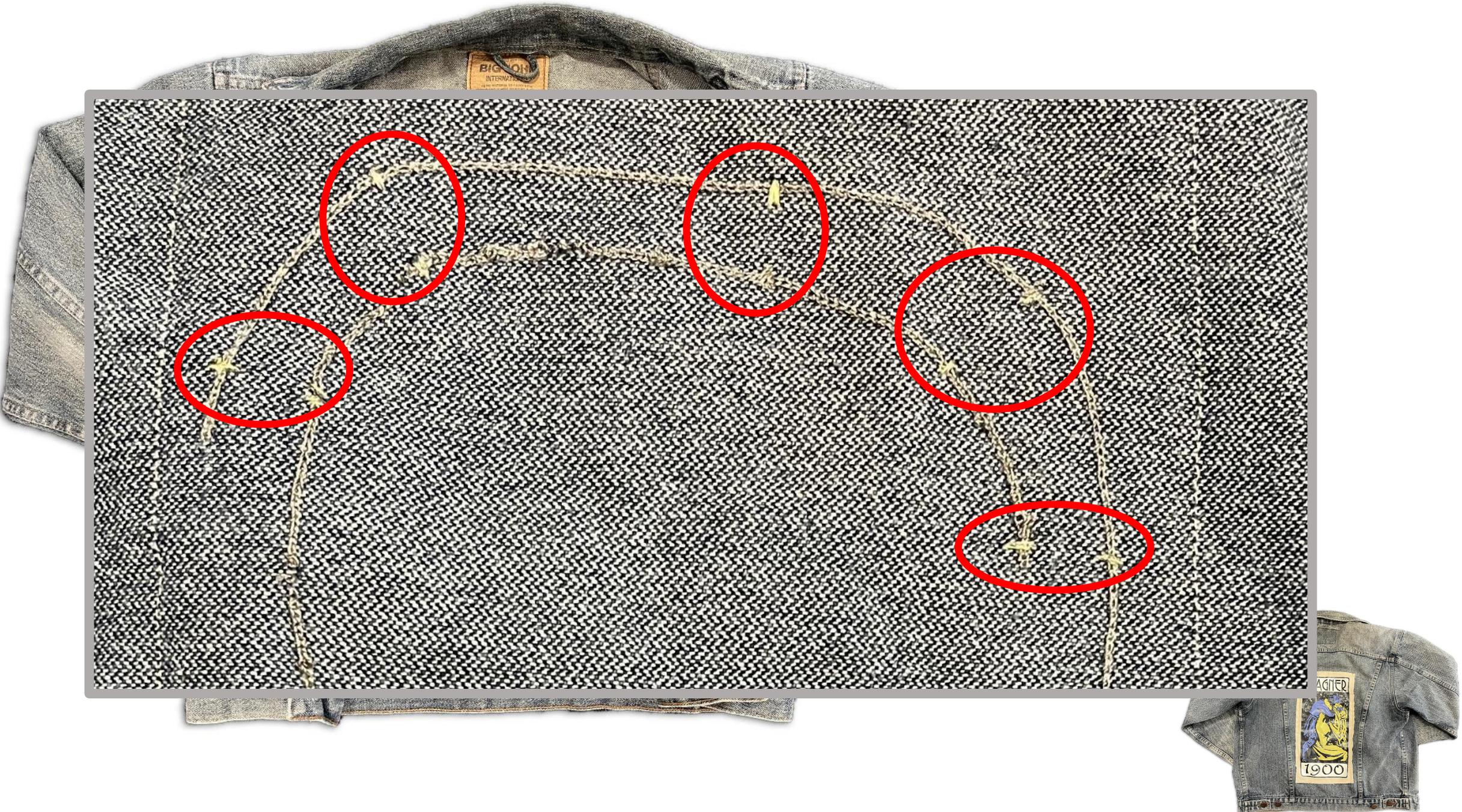
...and disassembly





Proof of concept: Embellished Jacket





BIG JOHN
INTERNATIONAL

WAGNER
1900



BIG JOHN
INTERNATIONAL

58





Applying e-textiles DfD to
creative practice

Costume design for Callaloo carnival arts 'Mersquerade'

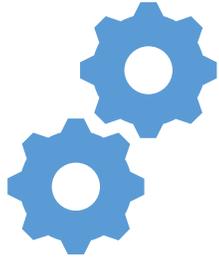




Building a small-scale textiles production space around DfD

Acquiring vintage miniature sewing machines that produce chainstitch

Future development



Refining the circuitry sewing process for efficiency



Chainstitch's aesthetic possibilities in e-textile design



A closed-loop e-textiles system needs to be developed to ensure e-textiles products are recycled

Thank you

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