

AiD Lab

Laboratory for
Artificial Intelligence in Design

人工智能設計研究所



THE HONG KONG
POLYTECHNIC UNIVERSITY
香港理工大學



Royal College of Art
Postgraduate Art & Design

The Sensory Materials Library - AiLoupe

Intelligent Design Systems for Innovation

Pecha Kucha

RP1: Ergonomic and Inclusive Design

deploys AI technologies to develop innovative body measurement and posture correction solutions to advance fashion design and wearables for health and well-being.

5 projects

- Using Augmented Reality (AR) to Understand Users' Design and Fitting Preference
- Ergonomic Design of Footwear
- AI Enhanced 3D Head Scanning Technology and Related Products Development
- Artificial Intelligence Designed Functional Clothing Design for Patients with Spinal Deformities
- 3D Modelling for Wellbeing

RP2: Innovation in Product and Service Design

focuses on participative, user-centered design research employing co-design methodologies to contribute to the continuous and iterative evolution of AI creative systems. The research incorporates machine and self-learning systems to accelerate design processes for products and services.

9 projects

- Big Data Analytics for Product and Service Design
- Human-Centred AI Design
- Intelligent Design System for Innovation
- Real-world Artificial Intelligence Narratives
- A Cyber System for Sustainable Design by Using Evolutionary Algorithms for Eco-innovation
- AI Design for the Autonomous Mobility
- Negative-mood Reduction among HK Youth with Robot PAL (Personal Avatar for Life)
- Small Scale Design Robotics
- Artificial and Distributed Intelligence and the Challenge of the 4th Industrial Revolution

RP3: Intelligent Fashion Design and Quality Control

explores algorithmic design that integrates machine intelligence and human knowledge with respect to fashion and textiles, leading to advances in design, quality control and manufacturing processes.

6 projects

- Artificial Intelligence Based Fashion Design Assistant
- Intelligent Textile System for Interiors, Fashion and Rehabilitation
- Artificial Intelligence for Fashion Illusion
- Computer Vision and Machine Learning Based Incoming Material Quality Inspection for Fashion, Apparel and Leather Products
- Intelligent Inspection System for Fashion and Textile Manufacturing Process
- Neo-Couture: Development of user-centered methodologies for AI assisted bespoke craftsmanship for couture fashion





Prof Sharon Baurley (PI)
Director of Materials Science
Research Centre



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Senior Tutor in Textiles



Dr Bruna Petreca
Senior RF in Human
Experience & Materials



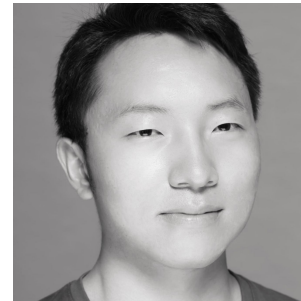
Dr Miriam Ribul
Senior RF in Materials Circularity
for Distributed Manufacture



Dr Chipp Jansen
Senior PDRA - AI



Lissy Hatfield
RA – Materials Characterisation



Toto Ma
RTH Scholar



Oscar Tuo
RTH Scholar



Designer at Future Fabric Expo from: <https://thesustainableangle.org/future-fabrics/>



- First attempt to measure fabric hand objectively
- Focus on bending



- Kawabata System (KES)
- Primary Hand Value (PHV)
- Total Hand Value (THV)
- Expert panels



- Mechanical and physical properties related to fabric hand
- Objective and subjective testing
- Trained panels

Peirce, 1930

Hoffman, 1951

Kawabata, 1980

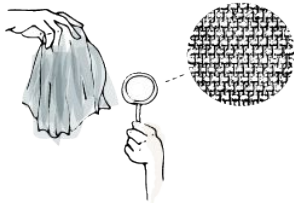
De Boos, 1994

Behery, 2005

Pan, 2007-2012

Petrecu et al., 2013

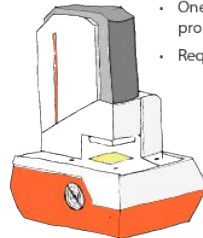
- Relation between physical properties (focus on fibre) and fabric hand



- SiroFAST System
- Focus on garment manufacture



- Partnered with SDL Atlas
- Fabric Touch Tester (FTT) - BETA testing
- One instrument measures all properties
- Requires expert knowledge



- Handling textiles is not only a semantic experience, but an emotional one.

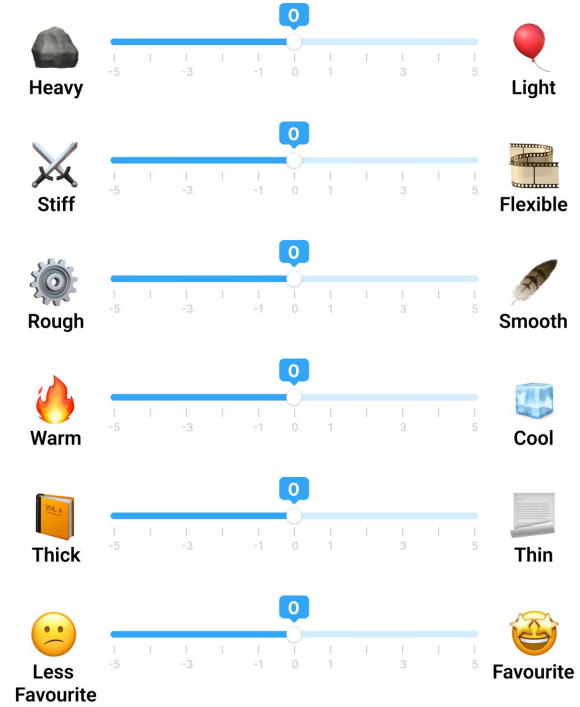


The evolution of methods for measuring the 'textile hand'
(Bruna Petrecu 2016)

CHALLENGES



Material Resource Centre @ Hong Kong PolyU



Six bipolar scales for assessing sensory properties of materials

The current state of the material library landscape



Objective testing with advanced equipment, such as the Fabric Touch Tester



Subjective testing through assessment studies with participants

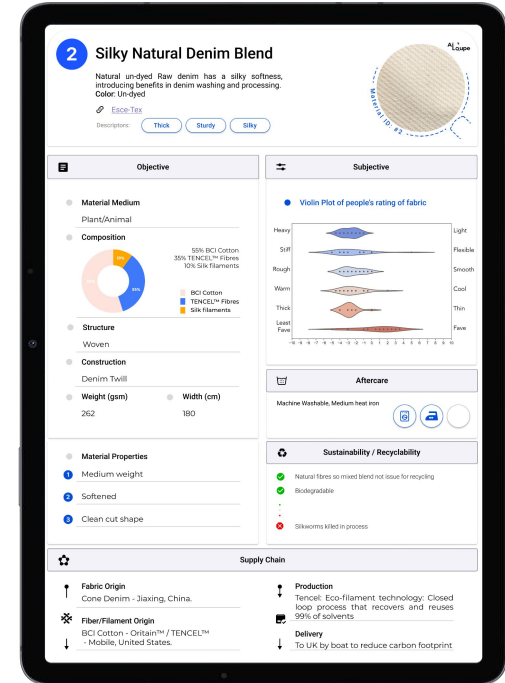


Image recognition and AI to translate data digitally through detailed material cards



MidLab

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Presenting AiLoupe @ Future Fabric Expo, London, June 23



Visitor using AiLoupe, looking at further developed material card

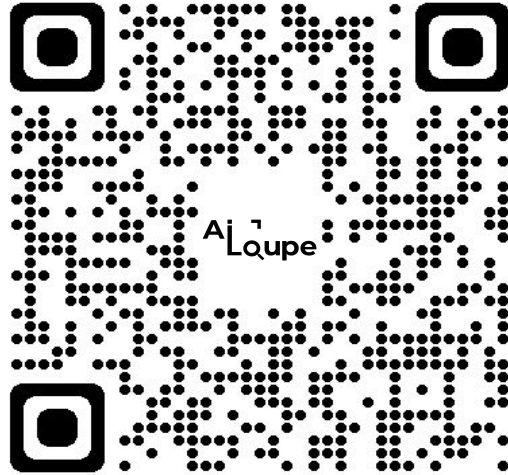


Material District 2022



Textile Circularity Centre
Consumer Experience Research Strand
<https://textilecircularity.rca.ac.uk/our-research/consumer-experience/>

sensory.materials@rca.ac.uk



Sign up for our co-creation workshop to further develop AiLoupe