



HKRITA

香港紡織及成衣研發中心

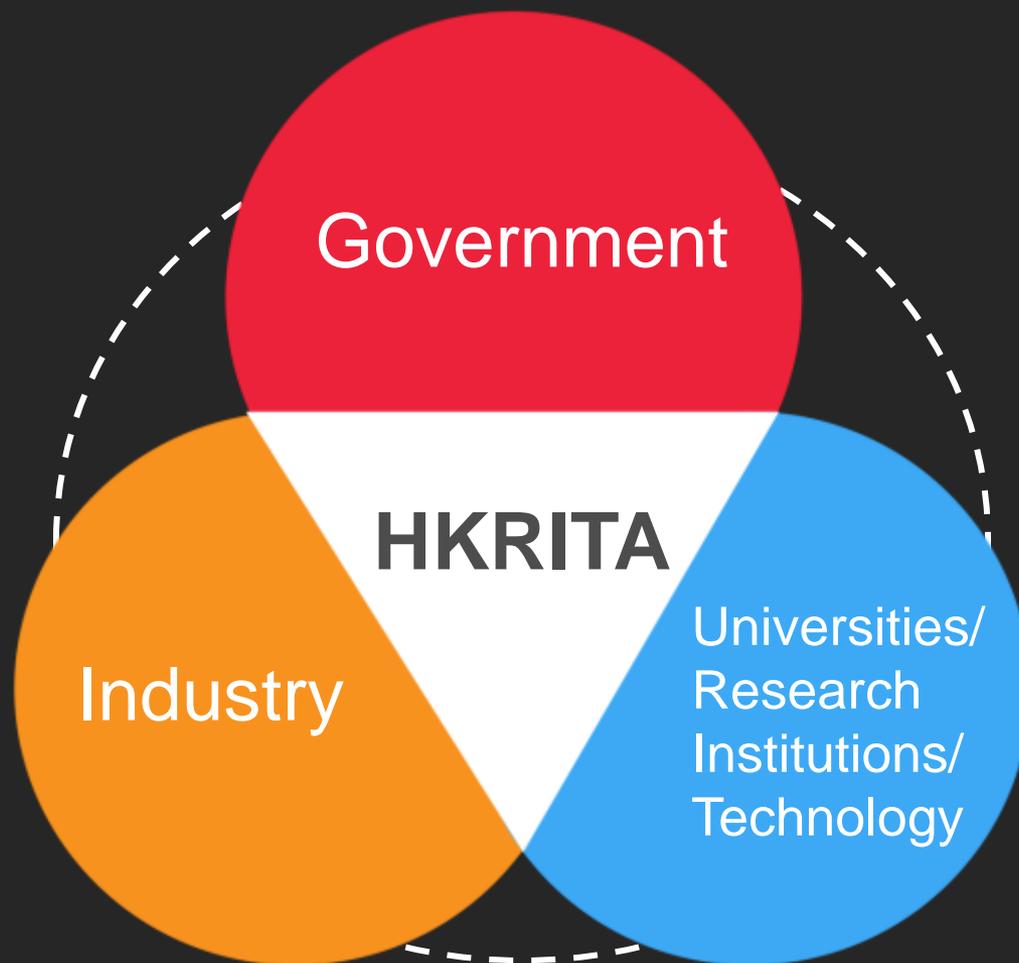
The Hong Kong Research
Institute of Textiles and Apparel



Our Background

- Innovation and Technology Fund started in Nov 1999
- HK Government's adoption of innovation and technology strategy
- Textiles and Apparel selected as a focus area
- HKRITA was established in 2006
- PolyU being the host institute

Our Stakeholders





Mill6
(Fall 2018)

Tai Po Industrial Estate
(Q2 - 2018)

Industrial Scale Recycling Plant & Research Facility

HK Science Park Research Labs

HKPC Dry Labs & Test Chambers

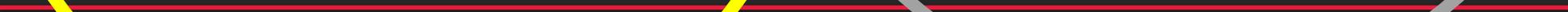
HK Poly U Offices



Sustainability

Industry
Advantage

Better Society





Sustainability

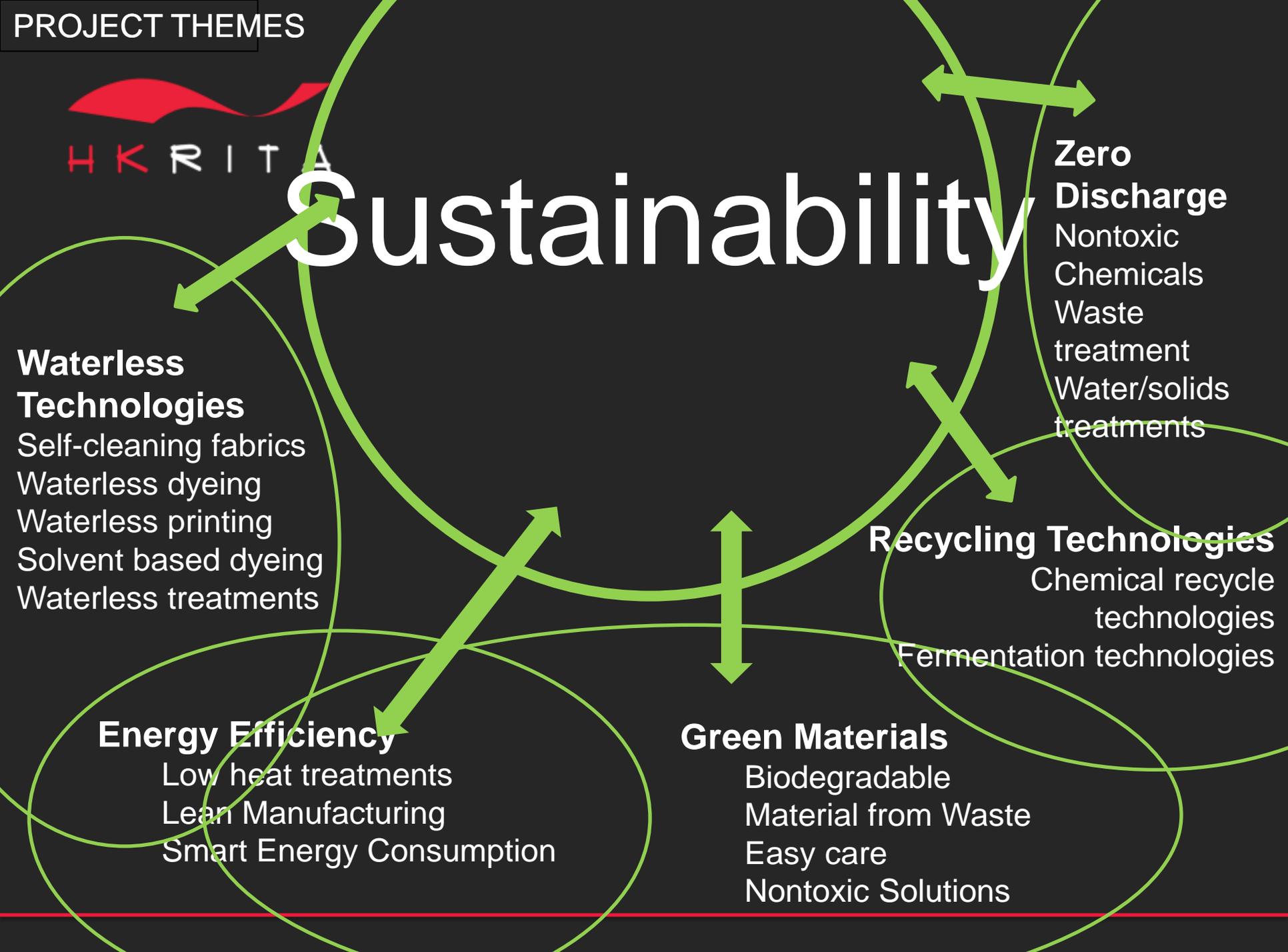
Waterless Technologies
Self-cleaning fabrics
Waterless dyeing
Waterless printing
Solvent based dyeing
Waterless treatments

Energy Efficiency
Low heat treatments
Lean Manufacturing
Smart Energy Consumption

Green Materials
Biodegradable
Material from Waste
Easy care
Nontoxic Solutions

Recycling Technologies
Chemical recycle technologies
Fermentation technologies

Zero Discharge
Nontoxic
Chemicals
Waste treatment
Water/solids treatments





Better Industry

Manufacturing technologies

Robotics- pick & place
Automation- linking
Seamless manufacturing

Material Science

High performance sportswear
Comfortable next to skin
Active support

Supply Chain Solutions

Agile manufacturing systems
demand forecasting
last mile solutions
Omni channel solutions

Health Care Solutions

H K R | Smart Materials
Wearable sensors

Protective Systems

Impact resistant materials
Air & Water filtration materials
Smart Materials

High Performance Sportswear

High Performance material
Active Support

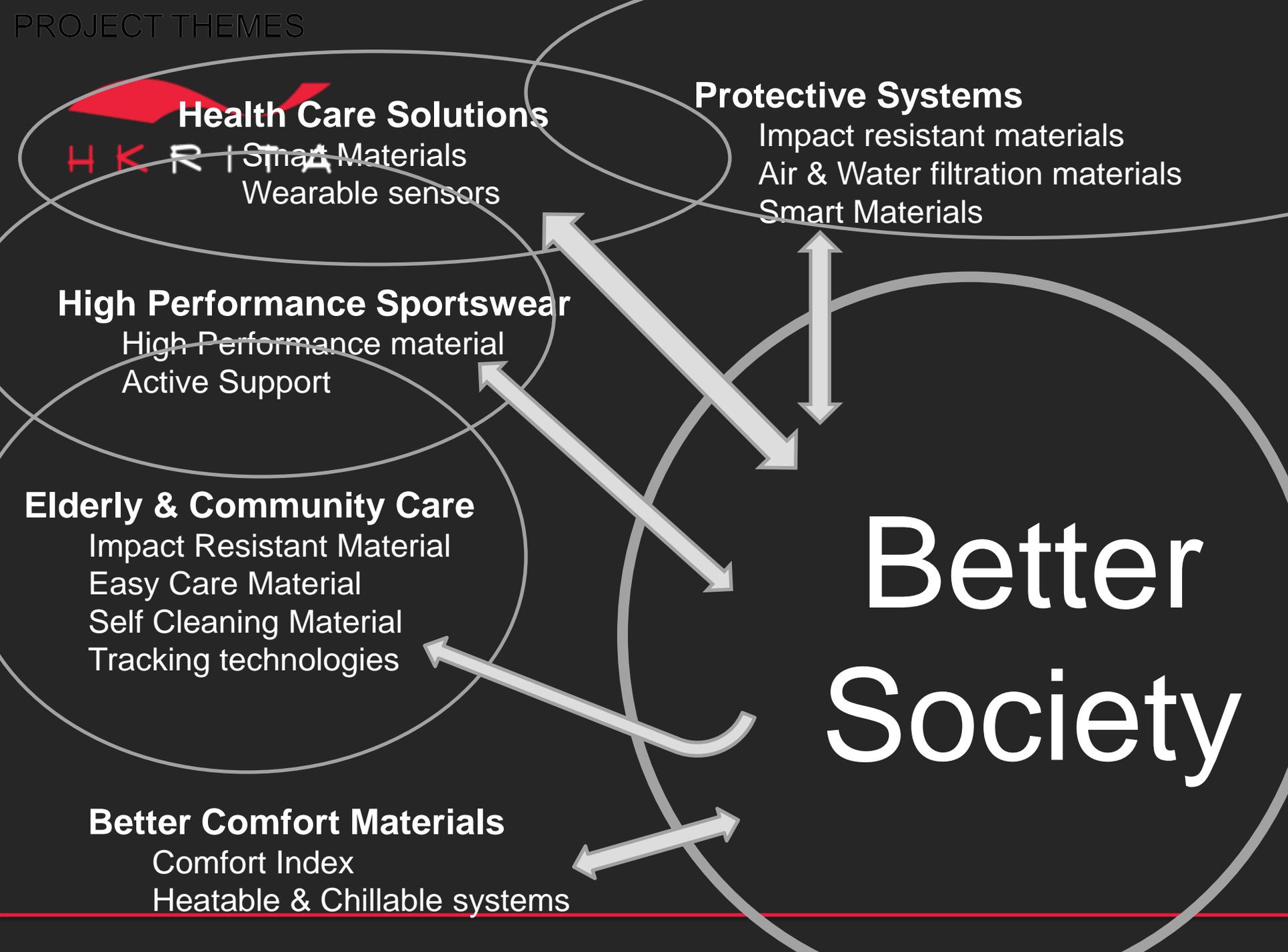
Elderly & Community Care

Impact Resistant Material
Easy Care Material
Self Cleaning Material
Tracking technologies

Better Comfort Materials

Comfort Index
Heatable & Chillable systems

**Better
Society**

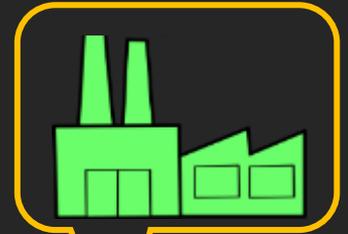




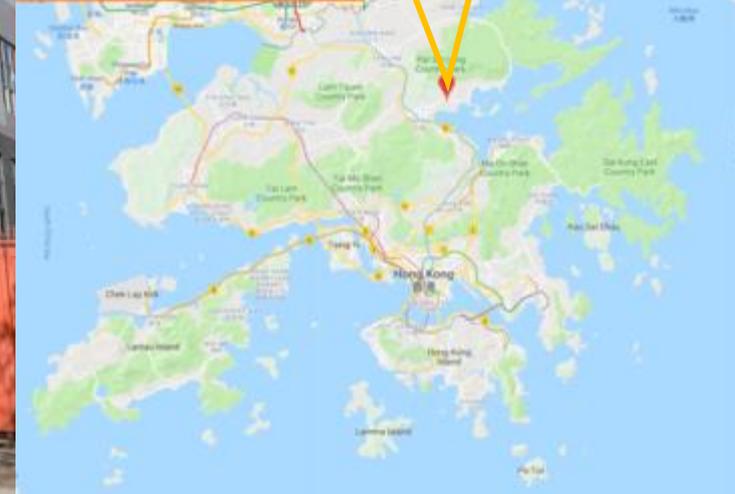
Sustainability



A Textiles Upcycling System in Hong Kong



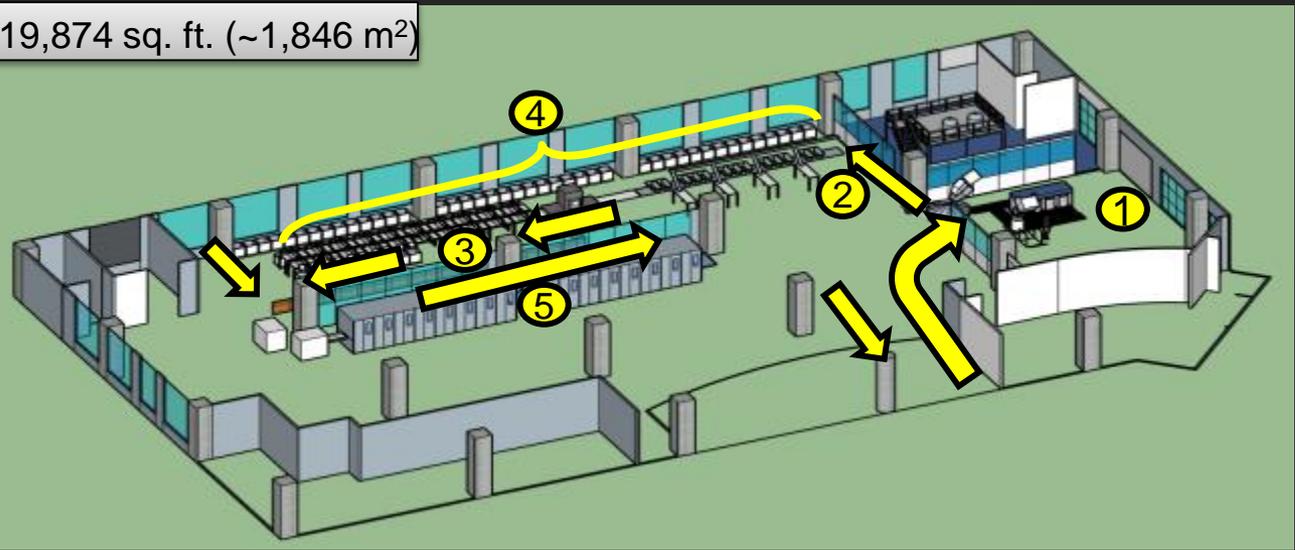
MAP OF HONG KONG





A Textiles Upcycling System in Hong Kong

19,874 sq. ft. (~1,846 m²)



- ① Ozone Sanitization Station
- ② Materials Preparation Station
- ③ Color Sorting Station
- ④ Smart Storage System
- ⑤ Fibre Processing System

⑤ Fibre Processing



Used Garments



Fiber



Sliver







Key Features of our System

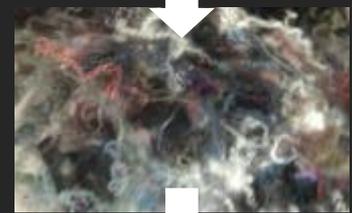
- Without the use of **Water** and no **Effluent** Discharge  
- Ozone and UV-C **Sanitization** at various processing stages to ensure product hygiene (>90% micro-organism reduction)
- **Auto-Color Sorting**  by advanced vision algorithms & **robots**
- Smart Buffer Storage using **AGV** and **Conveyors** ensure continuous production flow
- Enclosed **Dust Control** System to ensure Occupational Health and Safety



Garment to Garment (G2G)

H K R I T A

- A retail shop – recycling end user's used garment
- No water treatment
- Experience the recycling process in real time
- Educational demonstration
- Happen in a 40' container











Innovative Spinning System for Chitosan Yarn

HKRITA

- Chitosan fiber



- Naturally anti-bacterial; anti-inflammatory & analgesic
- Healing & re-generative functions; strengthening immunity

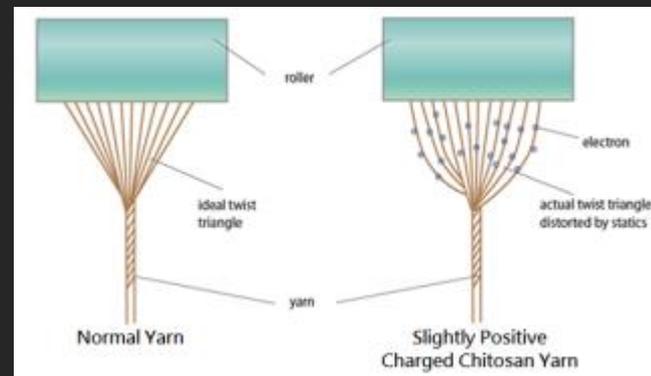
- Application

- Treatment for Epidermolysis Bullosa (EB)
- Wound healing

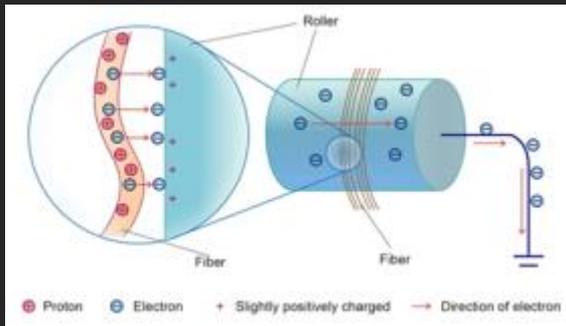


- Barriers for mass production

- High wastage due to statics
- Low productivity
- Poor mechanical properties
- High Cost – US\$80,000/ton



- Anti-static rollers for spinning



- Blended with other materials to improve the physical performance, while maintaining the anti-bacteria property

Sample	Antibacterial Rate by AATCC method	Antibacterial Rate by FZ method	Antibacterial Rate by ISO method
Control	-	-	4% can ensure the effectiveness of bio-function
2% Chitosan	90.69%	97.21%	1.55
4% Chitosan	99.02%	99.71%	2.53
6% Chitosan	99.02%	99.71%	2.53
8% Chitosan	99.02%	99.71%	2.53

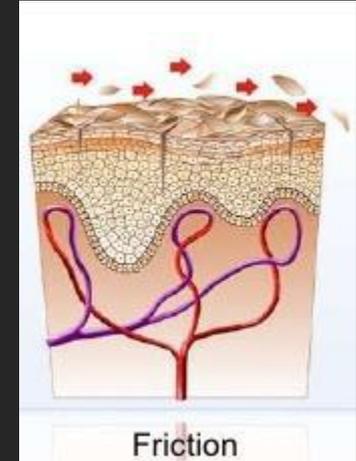
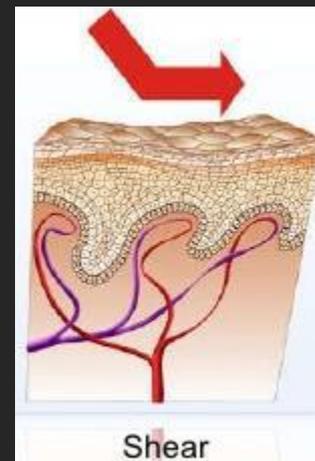
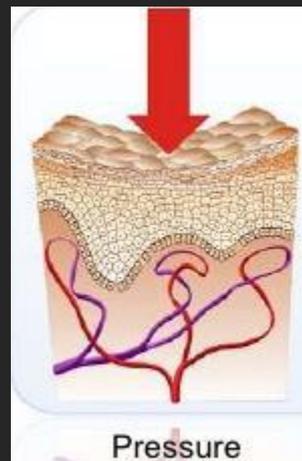


Better Society



Wheelchair Cushion

- Develop a wheelchair cushion based on biomedical; physiological & bio-mechanical needs of the Boccia player
- Provides Athletes with
 - Psychological comfort
 - Thermal and moisture management
 - Injury protection



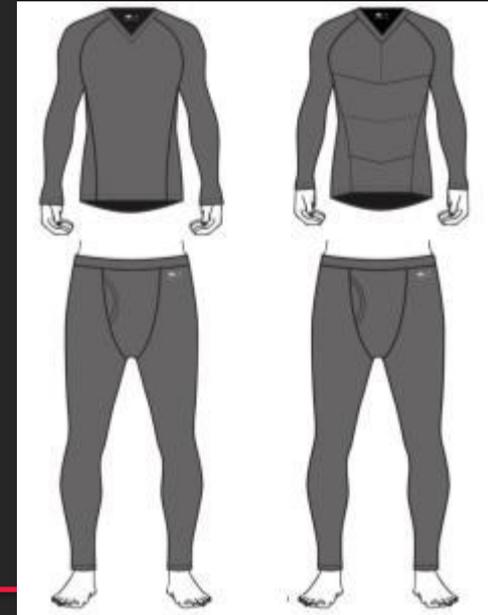


Next to Skin Uniforms

Thermal Management System

Thermal Protection Uniform

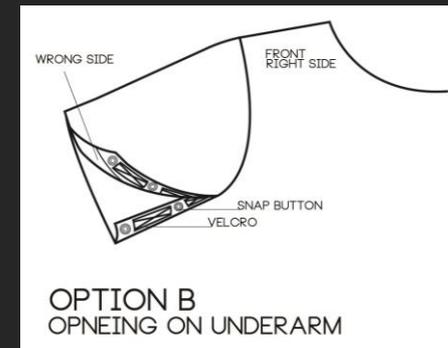
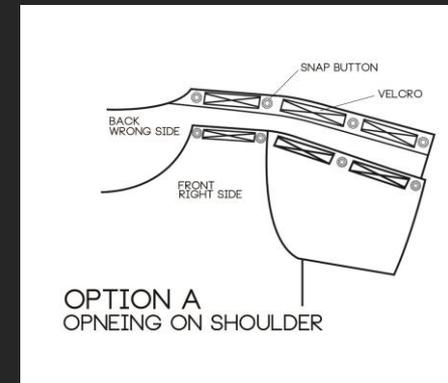
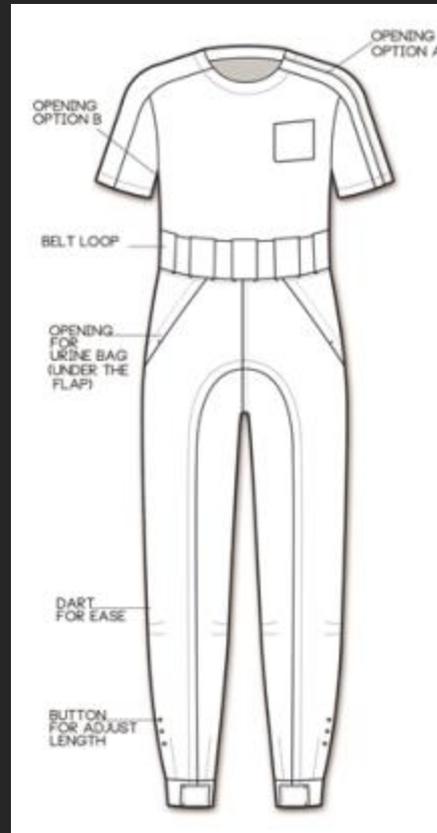
- Investigate the Marine police officers' working environment, and their thermal protection requirements on-field.
- Required key properties
 - ✓ Keep warm
 - ✓ Moisture management
 - ✓ Flame resistance
 - ✓ Light weight
 - ✓ Easy care
- Select the best fabric based on their physical properties and design the uniform.
- Produce prototype garments and evaluate the performance



Anti-Strip Jumpsuit

Design Features

- Durability of zippers
- Durability of velcro
- Design of zippers
- Garment fit
- Ergonomic design (knee part)
- Functional details (urinary catheter)

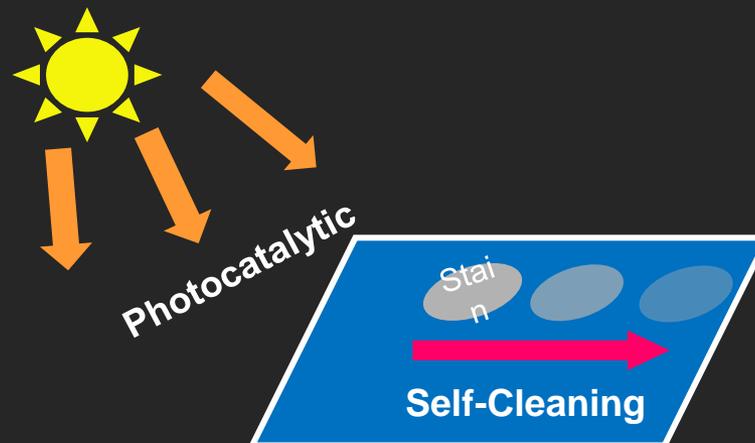




Self-Cleaning Treatment

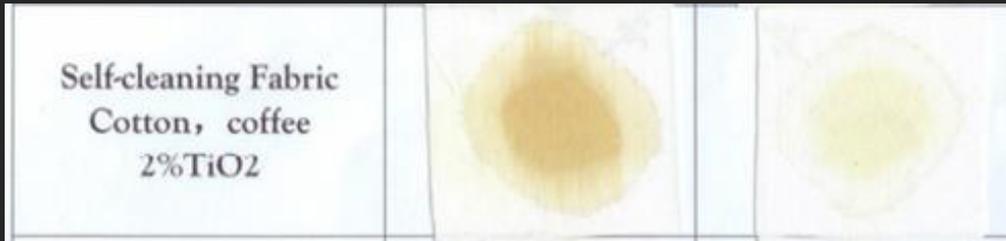
Nano-crystallite TiO_2 as photo catalyst when applied to textiles materials-

- decompose organic stains, soils, odours, harmful gases
- use simple spray process for fabric
- application under UV and visible daylight



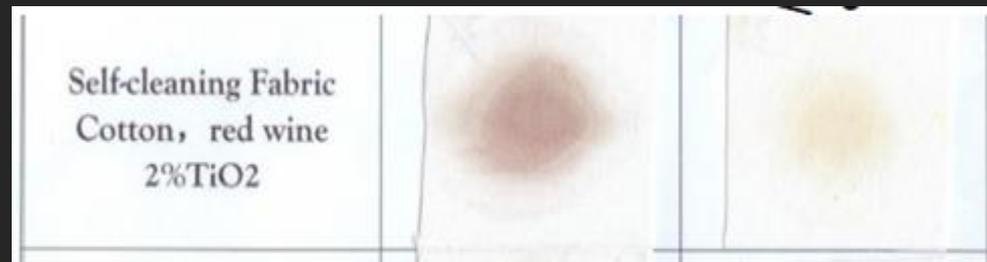
Self-Cleaning Treatment

Without treatment With 4 hrs sunlight treatment



Stain: Coffee

Without treatment With 4 hrs sunlight treatment



Stain: Red

我有正能量



■經處理的圍裙，能達到超強防水效果。

「五合一」兼度身訂造的圍裙，你聽過未？有機構與成衣研發中心合作，利用經「四合一」多功能整理技術及「自清潔織物整理技術」加工的布料，因應街市檔版的日常需要，義務為他們訂造合適的圍裙，將檔主日常使用的圍裙升級，搖身一變成為擁有多功能的「萬能圍裙」，令檔版的工作變得更加方便。

■圖：朱偉坤 / 文：湯肅皓

街市裙英



■「四合一」多功能整理技術及「自清潔織物整理技術」令布料可應付不同環境需要。



■盧樂謙（右）希望活動能將紡織文化與社會連繫。

甲殼提煉纖維 防菌抗敏

蝦殼、蟹殼都可以製衣？有成衣研發中心研究發現，從螃蟹、海蝦等甲殼類海產的外殼提煉出殼聚醣，再利用濕紡將其變成殼聚醣纖維，應用在衣物上，可達到防菌、抗敏的功效，同時更有效舒緩皮膚病患者的病情。

有效護膚舒緩濕疹

香港紡織及成衣研發中心業務拓展總監陳慧欣表示，由於殼聚醣具有生物抗菌功能，因此可以達到百分之九十九的抗菌功能，有效舒緩濕疹患者的病情，並達到保護皮膚的功能。另外，殼聚醣纖維不會被洗走，可以永久留在衣物上。

她又指，由於殼聚醣纖維有促進傷口愈合的功能，現時已被大量應用在醫療用的繃帶及膠布上，協助傷口愈合，「我哋相信，只要將殼聚醣纖維大量應用喺衣物上，將可為紡織界帶來重大改變。」



■有人替馮婆婆度身訂造圍裙，令她十分高興。



■有肉檔東主鍾情牛仔布，故阿健（圖）在設計圍裙時，以半牛仔、半棉布搭配。

為連結社區，發揚紡織藝術的可能性，六廠基金會近年與香港紡織及成衣研發中心（HKRITA）合作，舉辦「香車製造」項目，將HKRITA研發的科技注入布料，為荃灣香車街街市的檔版，設計出合適的多功能圍裙，為他們的生活帶來改變。基金會策展人盧樂謙說道：「圍裙同檔版們嘅生活密不可分，義務幫佢哋設計圍裙，可以同社區有更多嘅交流，持續嚟城市內推廣紡織活動，將紡織文化同社會連繫。」

度身義製 檔版受惠

為設計出一條檔版心儀而又合適的圍裙，升級再造設計師阿健（阿健）花了數個月的時間搜集資料，除了長時間觀察外，亦與檔版們溝通，了解他們工作情況，成功製造出切合他們需要的圍裙。阿健指，「唔同檔口嘅圍裙有唔同需要，好似豆腐檔同菜檔，由於檔口容易接觸到水，所以圍裙要以防水為主，並且要夠長；相反豬肉檔因經常沾染豬血同肉碎，所以圍裙用咗有自清潔織物整理技術嘅布。」他亦會按檔版要求及喜好，設計圍裙的款式及顏色，如有檔版鍾情牛仔布，他亦會盡量滿足。

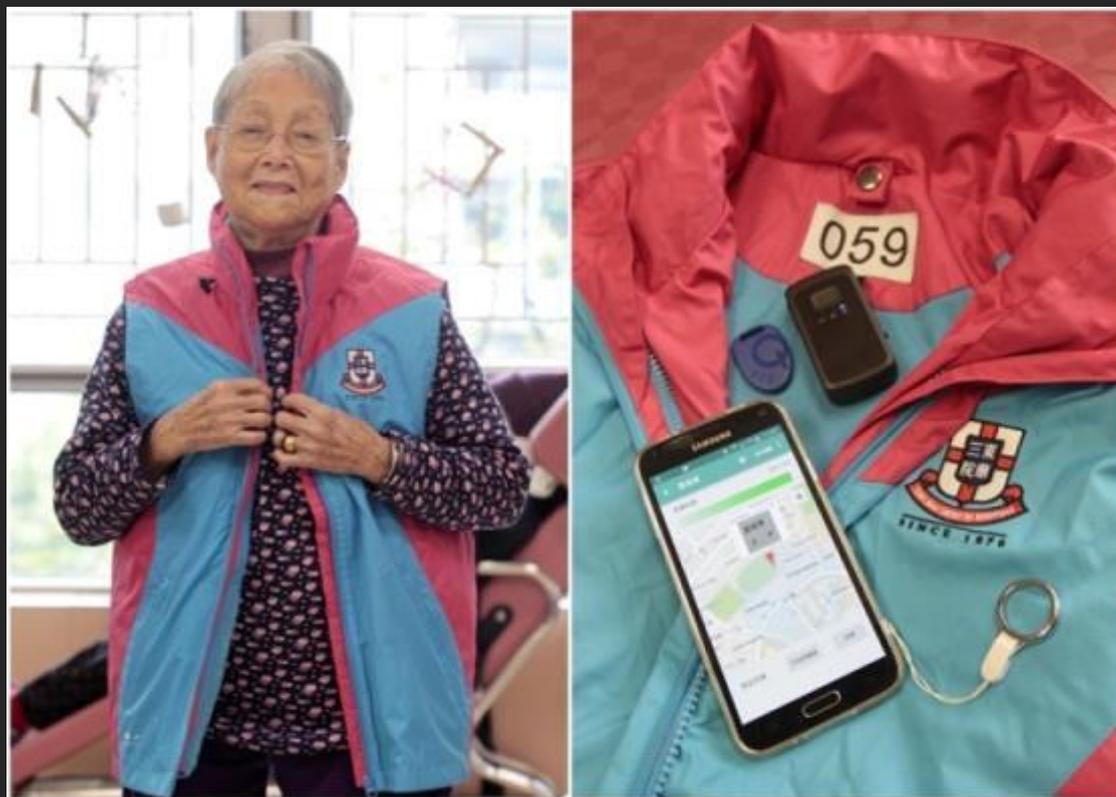
加工布料 防污防水

「好開心有人幫我度身訂造圍裙，自從着咗呢條高防水圍裙後，做嘢時圍裙冇再濕立立鎖住我。」阿健為馮婆婆設計圍裙時，特地用了經「四合一」多功能整理技術加工的布料，令其達到高效的防水功能，他更細心地在圍裙兩邊各縫上口袋，「佢幫我整咗一邊有拉鍊嘅袋用嚟裝錢，而另一邊打個嘅袋就用来裝工具，有咗呢條圍裙，做起嘢上嚟方便好多。」

「四合一」多功能整理技術係指防污、防油、防水同防皺；而自清潔織物整理技術，則係將沾上污漬嘅衣物放喺陽光下，就可以自行清潔。」香港紡織及成衣研發中心業務拓展總監陳慧欣表示，此兩種技術，能令衣物應付到不同的環境需要；其加工過程亦很簡單，「只要將化學品浸透布料，再用機器進行壓吸、預乾、固化嘅程序後即可」。經過加工的布料，一般更可經歷二十次的洗水。

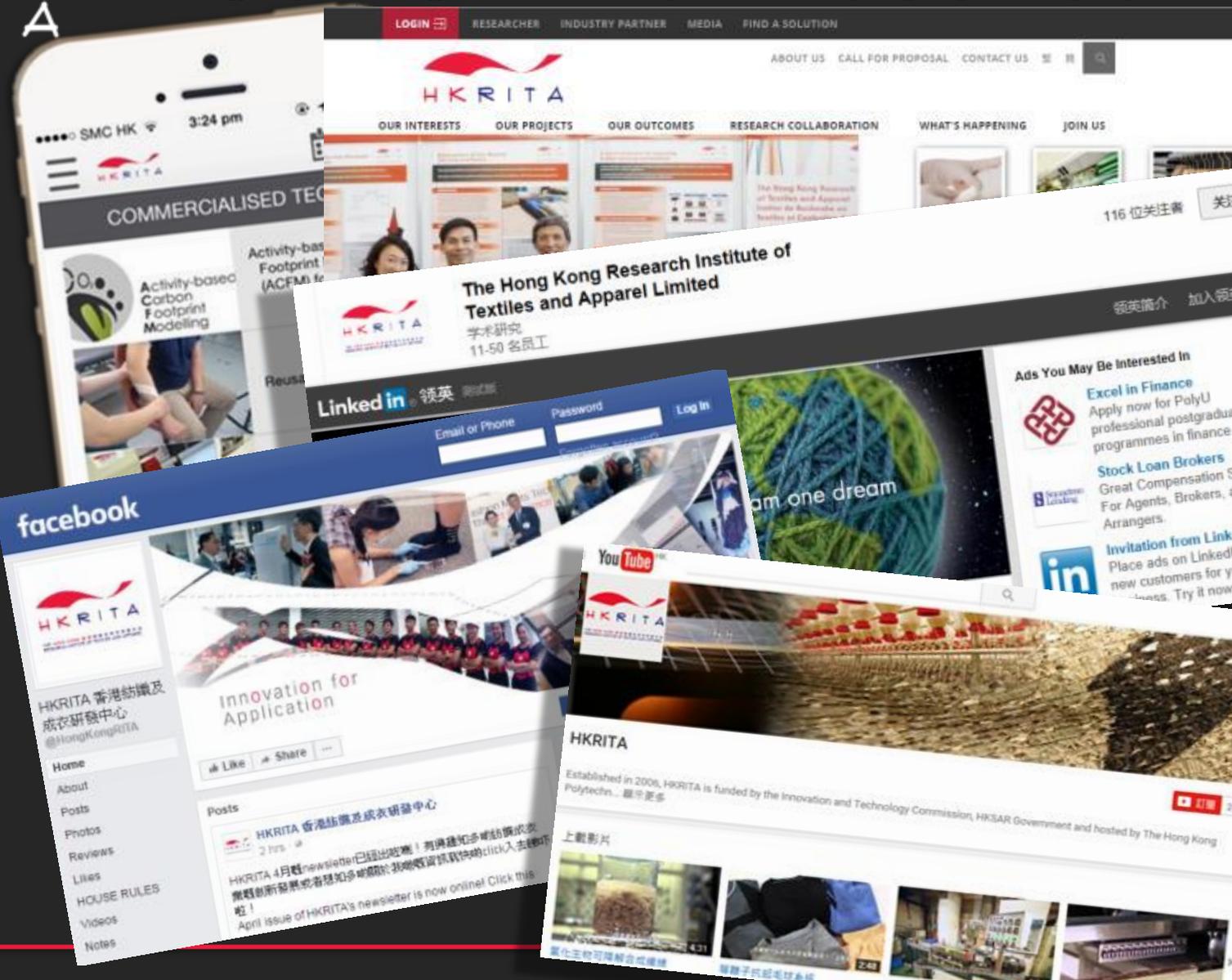
Elderly Jacket with GPS

The Tung Wah Group of Hospital Elderly Care Centers





Our Online Presence





Thank You

By Yan Chan, HKRITA
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