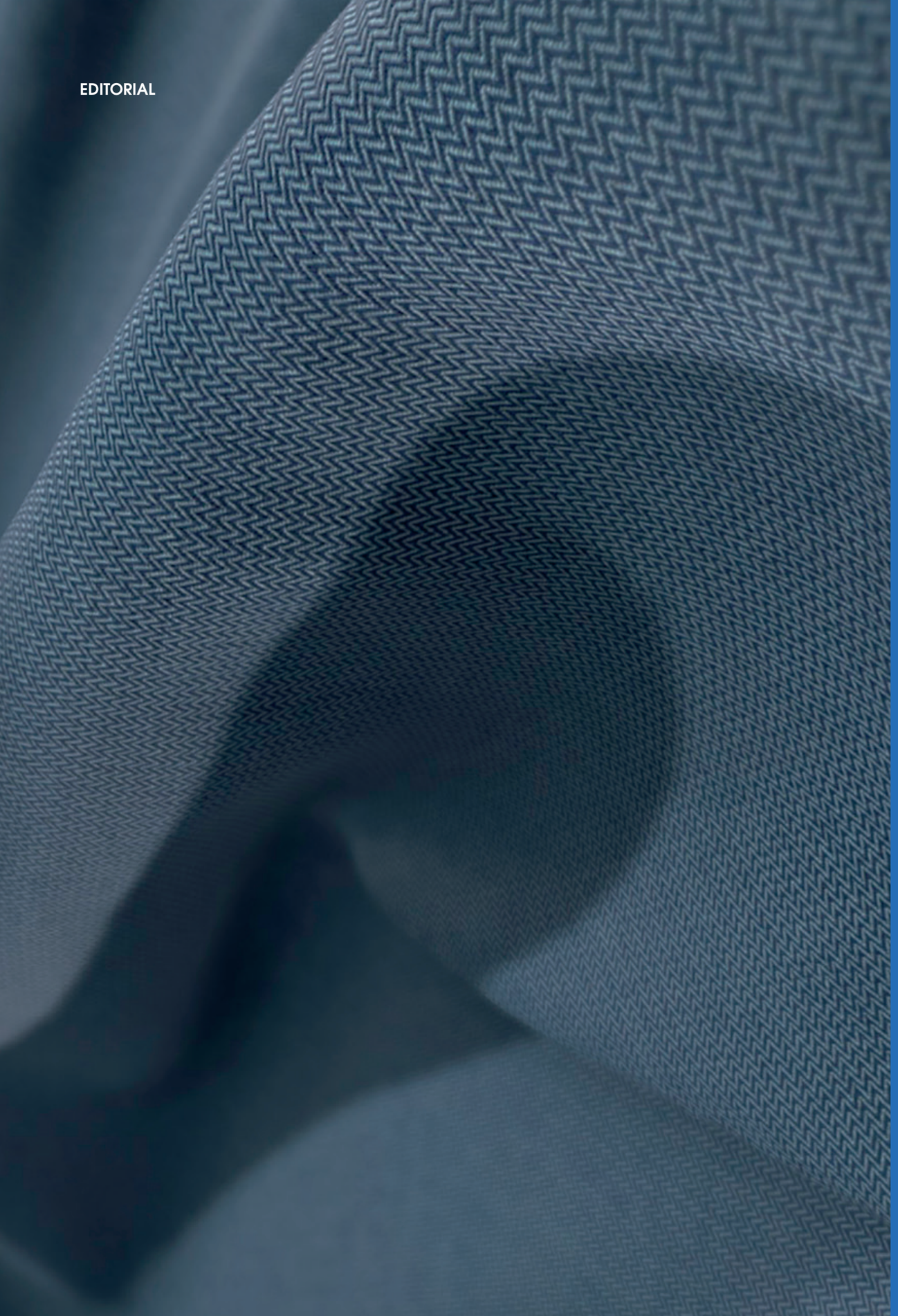
SIGNED

MAGAZINE OF HONG KONG DESIGN INSTITUTE

2022 / ISSUE 27

Rethinking the Everyday: MATERIAL ИON MATERIAL

重新思考：物質非物質



Rethinking the Everyday: MATERIAL NON MATERIAL

重新思考：物質非物質

This issue of SIGNED is the final in a three-part series exploring how design is helping to re-create the fabric of our society. Previous issues have questioned the role of food and its need for good design, and how virtual space is re-designing our collective realities. The articles in this issue, brought together under the title "Rethinking the Everyday: Material Non Material", probe the increasingly blurred lines between the physical and non-physical properties of the objects essential to our daily lives. The themed articles cover a broad spectrum of material substance in three distinct areas: the material, the inter-material, and the non material.

From dictating the growth patterns of fungi, to creating a substitute for environmentally-destructive fabrics by mimicking spiders, the material substance of the objects in our daily lives are being reformulated to allow for a more sustainable relationship with nature. The ability to communicate is at the heart of rich inter-material properties, something we see in both the ephemeral lifecycle of packaging, and the emerging value chain that will underpin the garment industry of the near future. This communicative approach is extended to the sensory world in the final article on the incredible abilities of high-tech prosthetic limbs.

Over these three issues, the critical role of communication has been emphasised time and again. Effectively, and efficiently, telling a story, whether it is a food story, a technology story, or a product story, has been consistently highlighted as the best and most viable way to bring about substantive change. Designers are an interface between what is possible to be done, and how some products, or service will be put into action. The key to succeeding in this role is to be an effective communicator, something all designers should prioritise in whatever field they work, or whether the "object" that they are facing is material, or non material.

本期《SIGNED》是我們探索設計如何幫助重塑社會組構三部曲中的最終章。我們在前兩期探討了食物在社會中扮演的角色，以及人們對其美好設計的需求，還有虛擬空間如何重新設定社會的集體現實。今期的內文以《重新思考：物質非物質》為題，檢視在我們日常生活中至關重要的事物，在實體與非實體屬性之間日益模糊的分界。專題文章涵蓋了三個不同領域的物質光譜—物質、中間物質和非物質。

從支配真菌的生長模式，到通過模仿蜘蛛來製造取代破壞環境的布料的替代品，我們在日常生活中不同事物的物質性正在被重新定義，藉此與自然建立更加可持續的關係。中間物質的特質非常多樣化，而聯繫能力就是其核心所在，在短暫的包裝生命週期，和在不久的將來支撐服裝行業的新興價值鏈中都可看到這一點。而在最後關於高科技義肢及其驚人能力的文章中，這種聯繫方式更超越物質界限，擴展至感官世界中。

我們在這三期中，一再強調溝通的重要性。要帶來實質改變，一直以來最佳和最可行的做法，便是精準無誤地說故事，無論故事是有關食物、科技還是產品。設計師是可能完成的，和如何將產品或服務付諸實行的橋樑。要做好這個角色，就要成為一個出色的溝通者，設計師無論是在哪個崗位，要處理的「對象」是物質還是非物質，都應該把這放在首位。

CONTENTS

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HKDI
HONG KONG DESIGN INSTITUTE
香港知專設計學院

Member of VTC Group
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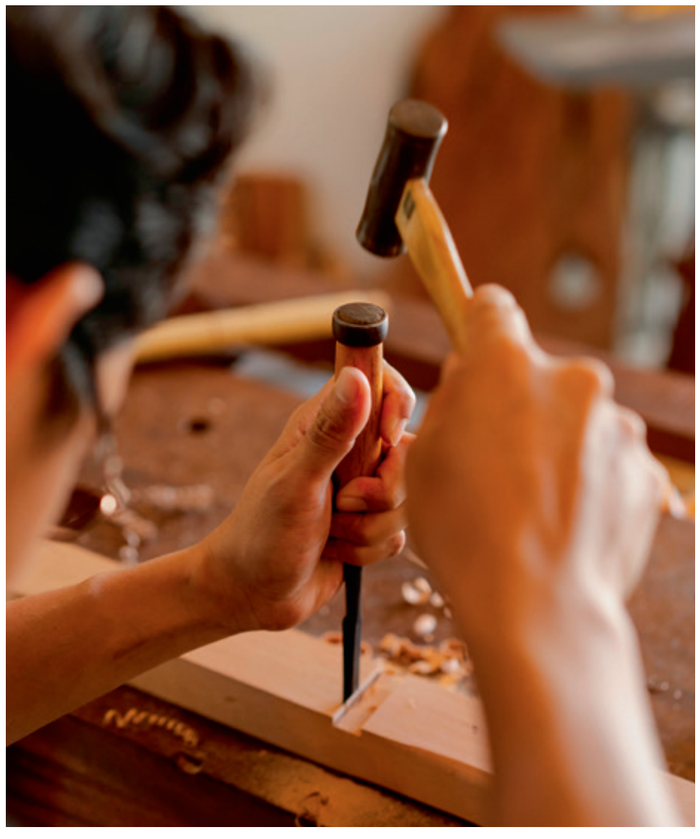
The Tree Project Vision

木材再造的可能性

賽馬會“樹木再造”
青年共創企劃
JOCKEY CLUB “TREE UPCYCLING”
YOUTH CO-CREATION PROJECT

HKDI DESIS Lab's Tree Project connects the youth through local trees.
香港知專設計學院社會設計工作室以木材升級再造聯繫青年和本地樹木。



1-2 Local carpenters will guide participants to make wooden gyro and wooden music box through online wood workshops
透過線上工作坊，本地專業木匠指導參與者運用舊木實現升級再造的木製陀螺和木製音樂盒。

Founded in 2013, HKDI DESIS Lab (Design Lab for Social Innovation and Sustainability) is a multidisciplinary research group proposing sustainable solutions in the design field. Its three-year programme, Jockey Club "Tree Upcycling" Youth Co-creation Project ("Tree Project"), brings the vision of local log upcycling to reality. It encourages young people to learn about local trees, integrate social innovative design and craftsmanship, regenerate local tree resources, and promote the social concept of "harmony between human and tree".

Tree Project breaks down the popular term "upcycling" into actions that can be accomplished by professionals and laymen. It brings together active community engagements and strong emphasis on design and craftsmanship in order to achieve the shared goal of building a sustainable future together. The first edition of the project runs from 2022 to 2023, with a series of three programmes in total. Echoing the upcycling theme, the project itself is also a recurring act, with a new round of project taking place every year until 2024.

Throughout the one-year journey, Tree Project prepares various educational sessions and community engagements by integrating a range of workshops, field trips, exhibitions, sharing sessions and seminars. For example, a log upcycling project named "Wish Wood Scheme" encouraged both primary and secondary students to design attractive upcycled products made of recycled wood using their own creativity. They could learn more about local log upcycling through a fun and creative design process. Raising awareness of the ecosystem in Hong Kong and wood waste reuse are messages Tree Project wishes to deliver to the public especially to the youth. What might not be aware of is the abundance of natural heritage and precious plant species available locally. In order to let participants learn through first-hand experience, Tree Project plans to take them on field trips across Northern District, including the Chi Kee Sawmill & Timber and North District Park guided by Health and Life Sciences students. Participants also have chances to go on field trips at log warehouses to learn about the local upcycling industry and the importance of preserving trees.

Tree Project also offers workshops for youth at both introductory and advanced level where upcycling design method and environmental-friendly design thinking are introduced through hands on experiments and creations. Participants are guided by local professional carpenters to use upcycled wood products to realise designs they came up with. Upcycled objects require a prolonged period to create, from the meticulous processes during recycling to repurpose, design and production. All these efforts are only worthwhile with a purpose. The programme has been postponed due to COVID and is planned to be resumed in July 2022 in the form of online or hybrid mode.

As one of the very first project targeting log upcycling in such depth, the meaningful programme will end with public exhibitions and sharing sessions. Audience can expect to see exceptionally creative pieces made by upcycled wood products, get inspired by the experience sharing from participants along the journey and witness how the programme spreads knowledge, raises awareness and benefits those in need in society.

香港知專設計學院社會設計工作室成立於2013年，是一個跨學科研究小組，專注為設計領域提供可持續發展的建議和方案。為期三年的賽馬會「樹木再造」青年共創企劃(「樹木再造企劃」)項目便是一個由社會設計工作室主辦、香港賽馬會慈善信託基金捐助的社群項目，鼓勵青年人了解本地樹木，融合社會創新設計和工藝，讓本地的樹資源重生，推動「人樹共融」的社會理念。

「樹木再造」企劃將近年非常受歡迎的「升級再造」一詞實行出來，而且讓專業人士和外行都可以參與及達成。其以共同構建可持續未來為目標，向參與者提供精彩的社區活動，並從中強調設計和匠人的重要性及獨特性。第一期項目由2022年至2023年舉行，包含三個階段。之後每年循環，直至2024年，名副其實是與「再造」相呼應。

在一年的活動旅程中，樹木再造企劃提供了各項教育機會和鼓勵社區人士參與的活動，包括一系列的工作坊、考察、展覽、分享會及研討會等，從不同角度讓公眾，尤其是年青人認識香港的生態系統和木材回收狀況。例如一個給中小學校園的「願・木」計劃，鼓勵中小學生接觸木地樹木升級再造，讓他們運用創意，把回收木轉化為可再用和美觀的物品，親身領略舊木材升級再造的價值和創意設計的樂趣。許多人可能不知道，香港有大量的自然遺產和珍稀植物品種。為了讓參與者通過親身體驗學習，樹木再造企劃帶他們到香港各地實地考察，包括由健康及生命科學的學生導遊，到志記鋸木廠及北區公園等地。此外，參加者亦有機會到原木倉庫實地考察，了解升級再造產業和保護樹木的重要性。

樹木再造企劃為年青人提供初級和高級木材升級再造工作坊，通過親手實驗和創作，介紹升級改造的設計方法和環保設計思維。這些工作坊讓參與者在專業木匠指導下，運用舊木實現其設計意念。事實上，升級再造工程繁雜，需時亦長，如非為了讓舊木謀得新功能，花費人力物力去回收、清潔再利用便無意義。計劃因新冠疫情而延期，將於七月以線上或混合模式恢復。

作為香港第一個深入探討舊木再造的項目，樹木再造企劃這個別具意義的項目會於結束時匯集成公共展覽和分享會，邀請廣大市民參與。參觀者可以看到舊木升級再造的獨特創意，並在參與者分享的經驗中獲得靈感，見證這個項目如何傳播知識、提高公眾意識和回饋社會。

Sustainability in Education

教育的可持續發展

At HKDI's Centre of Innovative Material and Technology, students and designers are constantly exploring how to achieve more possibilities for sustainability and upcycling through conscious material choices and innovative techniques.

在香港知專設計學院旗下的知專設創源，學生和設計師都不斷探索如何從物料的挑選和創新的技法中，實現可持續發展和升級再造的更多可能性。

1. Artworks from different events organised by Centre of Innovative Material and Technology（CIMT）
近年一些由知專設創源舉辦的活動或展覽裏面的參展作品

2. CIMT houses a series of innovative materials from around the globe
CIMT 的物料圖書館收藏全球各地創新的物料

3. Upcycling crochet workshop led by alumnus Ms. Tina Ho, an expert in sustainable textile design.
由校友、可持續紡織物料專家 Tina Ho 小姐指導的鉤針升級再造工作坊。

4. Collaborative project between HKDI and China National Silk Museum—— "Motif in Force" exhibition
香港知專設計學院與中國絲綢博物館的合作展覽項目名為「Motif in Force」

HKDI's Centre of Innovative Material and Technology (CIMT) is a powerhouse for material and technology research and innovations. Housing an extensive collection of material archive sourced worldwide, the centre emphasises on addressing the current pressing issues in design: sustainability.

CIMT's material library curates globally sourced materials. A particular section of the library is dedicated to materials that can educate and inspire students and designers from different disciplines to apply sustainable solutions in their projects.

With a mission to educate both students and the public on material sustainability and innovation, the centre serves as a platform for innovation experimentation, cross-industry research and collaborations between industry partners, students and alumni designers.

The centre constantly organises sustainability projects engaging students through hands-on practice in order to nurture their skills and knowledge in sustainable product development. Collaborations with Mainetti, the largest hanger company

in the world, gave rise to a few recent projects aligning with the overarching sustainability theme. Students participating in the filtration development process for reusable multi-purpose face masks gained first-hand experience through every step of the way including material sourcing, material analysis, material testing protocol, human performance testing and data analysis. In the natural dye project, students experimented with turmeric dye, a natural colouring agent, also an ancient anti-inflammatory herb in the application of traditional Chinese medicine, as a coating on textile.
It was found in a SGS antibaterial function analysis that the antimicrobial

effectiveness in the turmeric is as high as 70% - 90%. In other collaborative projects, the centre also invited students from Higher Diploma in Dispensing Studies in Department of Health and Life Sciences, Hong Kong Institute of Vocational Education (Chai Wan) to apply other Chinese medicine such as wormwood on materials to examine their effects.

Cultural heritage is another focus in CIMT. The centre aims to cultivate students' appreciations of art and craft through culture studies, exhibitions and participatory workshops. Currently on view at the China National Silk Museum is a recent project collaborated with China National Silk Museum. Titled "Motif in Force", it is a diverse exhibition including fashion textiles, accessories and home furnishings. Through rearranging and assigning new colour palettes to recreate motifs from ancient Chinese history, students reinterpret heritage patterns through diverse techniques including embroidery, shibori, heat transfer printing, silk screen printing and foil printing.

CIMT also regularly carries out workshops to educate students and the public on sustainability. For example, the centre has engaged alumnus designer Ms.Tina Ho, an expert in sustainable design, to offer various upcycling educational workshops on crochet and weaving.

香港知專設計學院旗下的知專設創源（CIMT）是一所創新物料及科技研究中心，儲藏著大量從全球各地搜羅的物料樣品及檔案，專注應對可持續這個當前於設計界最迫切的議題。

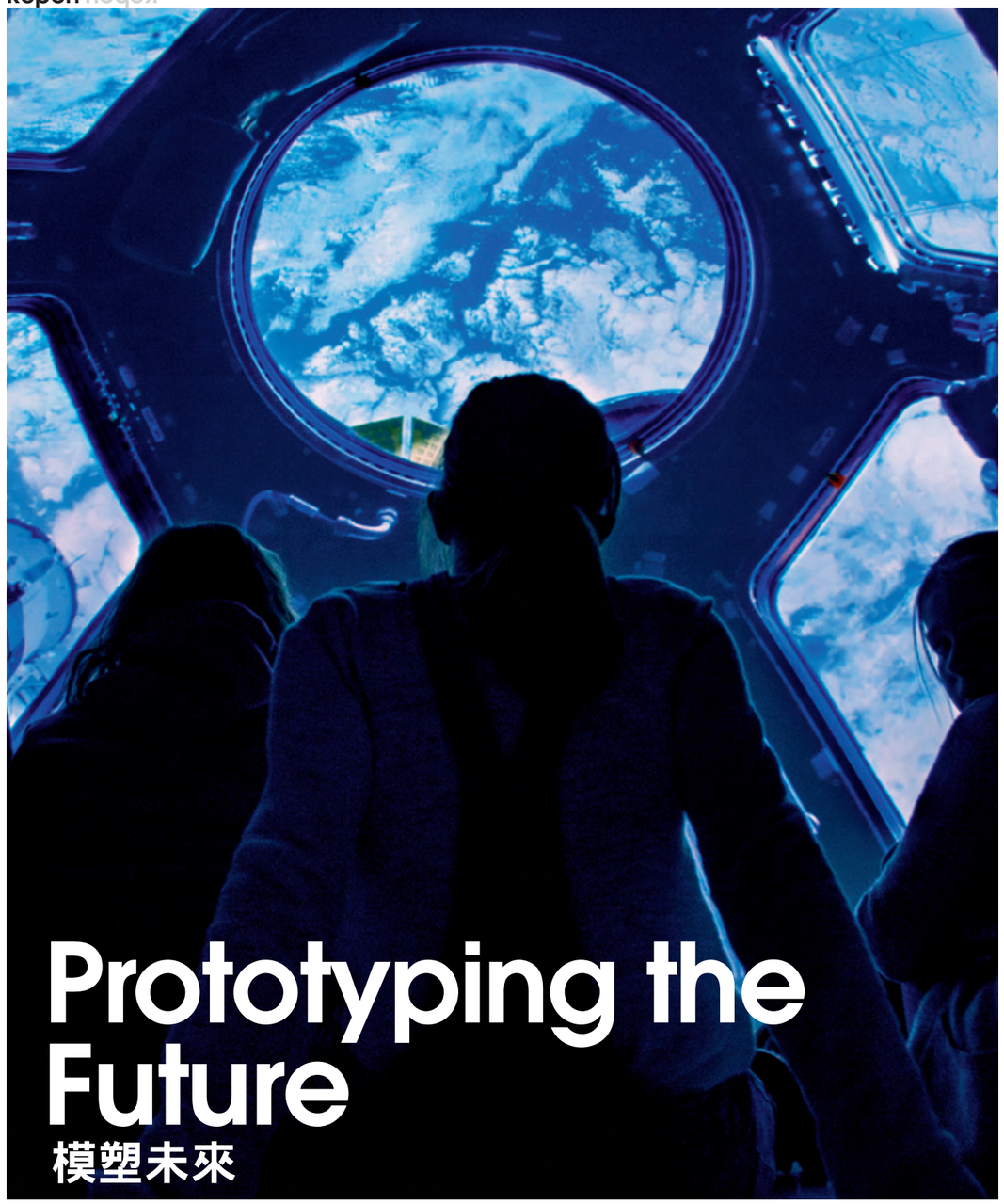
位於 CIMT 的物料圖書館收藏了全球各地創新的物料。當中有一部份專門提供教育和啟發不同學科的學生和設計師的材料，讓他們可以在自己的項目中應用可持續的解決方案。

中心的使命，是教育學生和公眾有關物料的可持續性和創新，並作為創新實驗、跨行業研究以及與業界、學生和設計師校友之間的合作平台。

中心不斷舉辦可持續的項目，讓學生通過實踐，來培養他們在可持續產品開發方面的技能和知識。與世界最大的衣架公司 Mainetti 的合作，促成了幾項以可持續發展為題的項目。學生通過參與可重用多用途面罩的過濾設計，在每個過程中，包括從物料採購、分析和測試系統，到人體功能測試和數據分析等，得到第一手的體驗。另外，在天然染料項目中，學生用了薑黃染料，亦即是一種天然顏料和古代消炎抗菌中藥，測試其在紡織物上作塗層的應用。他們發現利用薑黃染出的面料在SGS抗菌測試下有高達70%-90%的抗菌率。在其他合作項目中，中心亦邀請香港專業教育學院（柴灣）配藥學高級文憑的學生實驗如苦艾等其他中草藥在面料中的應用及效果。

文化傳承也是CIMT的研究和教育重點。中心期望能通過文化研究、展覽和工作坊培養學生對藝術和工藝的欣賞。目前在CIMT 展出師生與中國絲綢博物館最近的一個合作項目，展覽名為「Motif in Force」，展覽品包括時裝紡織品、配件及家具設計。學生透過重組和重新運用色調，重塑中國古代歷史元素，再搭配刺繡、靛藍染色技術、熱轉移印刷、絲網印刷和箔印等多項技術，重新演繹傳統圖案。

CIMT 還會定期舉辦工作坊，教育學生及公眾有關可持續發展的重要性。例如早前邀請了校友、可持續紡織物料的專家Tina Ho小姐，多次指導鉤針和編織等升級再造工作坊。



Prototyping the Future
模塑未來

Hosted by HKDI, the HKDI Inspire* Prototyping the Future 2022 in March is a three-day online conference event focusing on the current popular theme of artificial intelligence, digitisation and the metaverse. The lineup of this year's conferences includes Gerfried Stocker, Artistic and Managing Director at Ars Electronica, Jorgen Sevild, Director of Business Development and Client Strategy at INQOVA, and Yat Siu, Co-Founder and Chairman at Animoca Brands.

「HKDI Inspire* Prototyping the Future 2022」於三月份由香港知專設計學院主辦，是為期三天的線上講座，內容圍繞人工智能、數碼化和元宇宙等當前流行的主題。今年的嘉賓陣容包括 Ars Electronica 的藝術總監 Gerfried Stocker、INQOVA 的業務發展和客戶戰略總監 Jørgen Sevild，以及 Animoca Brands 聯合創辦人兼董事長蕭逸。

Deep Space 8K, a room developed at Ars Electronica Centre to showcase breathtaking pictures and videos in 3-D with unmatched precision. Visitors in this photo were experiencing the view of the Earth from International Space Station. (Photo courtesy of Ars Electronica)
Deep Space 8K 是由 Ars Electronica 中心團隊特別研發建造的展覽空間，以超高清晰度展示圖片或 3-D 影像視頻。圖中觀眾正欣賞從國際太空站拍攝的地球影像。（圖片由 Ars Electronica 提供）

Game Changer Artificial Intelligence, from Automation to of Digital Systems
人工智能，從數碼系統的自動化到自主化

Gerfried Stocker

Artistic and Managing Director, Ars Electronica

Ars Electronica 藝術總監

In Gerfried Stocker's words, Ars Electronica is "a traditional organisation focusing on digital technology". Founded in 1979 in Linz, Austria, Ars Electronica began as a five-day festival for digital art happened annually. Many in the industry consider the Ars Electronica festival to be the most exciting event for digital artists worldwide. Today, it has successfully grown from a festival to an aggregation of infrastructures supporting the digital arts industry. Prix Electronica is the other annual event under Ars Electronica and is now the largest international competition for cyber arts. "This year, we received 3,500 submissions from 95-100 countries." Stocker says.

In addition to the annual festivals and competitions, Ars Electronica also offers Ars Electronica Center, an educational facility, as well as Ars Electronica Futurelab, a research centre. "Presenting is not enough. You need your infrastructure to produce and do research for development," Stocker says.

In Stocker's opinion, Ars Electronica's decades-long success comes down to two factors. "The first important thing is joining forces, and the second is arts thinking, to be able to open up your mind to possibilities and tap into different directions. Design thinking is a very powerful tool to find solutions to problems. Design thinking narrows down, and arts thinking opens up our perspectives."

Diversity and interdisciplinary is no new tale in the world of Arts and Design, and it is the same for Ars Electronica. Stocker says: "We need to bring together the expertise of people from different disciplines." At Ars Electronica, the fusion of technology and the arts happens on a daily basis. "It doesn't matter so much how advanced the technology is. With the expertise of art, you can find a better understanding of the transformational forces technology has in society." Stocker explains.

Ars Electronica's recent projects all embody these ideas. We see a wide range of offerings by the organisation, ranging from live classical music visualised through contemporary digital art; dress made of modified silk with fluorescent proteins; song lyrics recorded as DNAs within a strand of bacteria. With art and technology, innovation and advancements in any discipline is made possible, in the meantime opening up more opportunities in research and educational purposes.

With all these exciting projects achieved, Stocker and Ars Electronica still face a fundamental question. "How far do we want to go with technology?" While the world has yet to reach to a solid agreement on the moral conduct of technology innovations and the extent of their applications, knowing that organisations like Ars Electronica are relentlessly exploring and trying to understand more, we feel that we're in good hands.

Gerfried Stocker形容Ars Electronica是「一間專注於數碼科技的傳統公司」。Ars Electronica 於1979年在奧地利林茨成立，最初是個一年一度、為期五天的數碼藝術節。許多業界人士認為Ars Electronica藝術節對全球數碼藝術家而言，是非常重要的活動。今天，它已從一個節目發展成為滙聚基礎建設，來推廣數碼藝術產業的組織。Prix Electronica是Ars Electronica旗下的另一年度盛會，是如今全球最大的網路藝術比賽。Stocker表示：「今年我們收到了來自 95至100 個國家共 3,500 份的申請。」

除了年度的節日和比賽外，Ars Electronica還設有教育中心Ars Electronica Center和研究中心Ars Electronica Futurelab。Stocker表示：「單單展示是不足夠的。 你需要基礎建設來生產和開發研究。」

在Stocker看來，Ars Electronica幾十年來的成功可用兩點概括。「首先，最重要的是聯合不同的力量，其次是藝術思維，使我們能接受新事物，發掘各種可能性。設計思維一直以來被視為尋找答案的有力工具，亦能幫助我們縮窄範圍；而藝術思維則能拓闊我們的視野。」

多元和跨學科在藝術與設計領域並不是甚麼新鮮事，對Ars Electronica亦是如此。Stocker說：「我們要匯聚不同學科人才的專業知識。」在Ars Electronica，科技與藝術融合是經常發生的。「科技有多先進並不重要。只要有藝術專業的加持，你就可以更好地理解科技在社會中的變革力量。」Stocker解釋道。

近期Ars Electronica的項目均廣泛地體現了以上的想法。如運用當代數碼藝術視覺呈現古典音樂現場演奏；將螢光蛋白基因導入絲的改良裙子；還有歌詞被轉碼成基因，再存放於一列細菌中。藉助藝術和科技，任何領域的創新和進步皆成為可能，亦為研究和教育造就更多機會。

完成這些精彩的項目後，Stocker和Ars Electronica仍然面臨一個基本問題：「我們想在科技方面走多遠？」雖然世界尚未就科技創新的道德行為及其應用範圍達成一致共識，但可以令我們安心的是，像Ars Electronica這樣的組織正不懈地就這個議題探索和了解更多。

The True Metaverse will be Decentralized
元宇宙的真諦——去中心化

Yat Siu 蕭逸

Co-Founder and Chairman, Animoca Brands

Animoca Brands 聯合創辦人兼董事長

The metaverse has a lot of uncertainties, but one thing is for sure: the future of our online lives will not be based on closed, controlled and proprietary systems. Within the metaverse, a new mode of online experience emerges, recognising our individual rights to own our personal data. Yat Siu, Co-Founder and Chairman of Animoca Brands, certainly believes so.

Animoca Brands is a Hong Kong based firm specialising in digital entertainment and blockchain gaming. It started as a traditional gaming company, but soon found itself entering the fast-growing market of blockchain economy, and forming an impressive portfolio of more than 150 blockchain-related companies including Opensea, the Sandbox and CryptoKitties.

Popular gaming technologies like VR and AR are simply different ways of experiencing the digital world. According to Siu, what is core to the metaverse is the access and ownership of the world's most valuable resource, data.

Most of us go on the internet every day. Some cannot go an hour without it, from the very minute they wake up until they go back to sleep at night. The amount of data created and the energy involved is unimaginable. However, without blockchain and the metaverse, the ownership of all the valuable data created does not go to individuals. Instead, they are owned by the platform.

We have been so used to not owning our own online data that the idea of getting the ownership back seems foreign. However, as Siu puts it, "a digital asset can have a legacy, the same way we have legacy in the real world." Decentralized ownership of digital assets makes sure your data is not used or manipulated against your own will. Social media platforms will no longer have the rights to delete your account or preventing you from modifying your own data.

In the physical world, we have our self-identities. We constantly purchase items to complement and get closer to the identity we aspire to become. Not much has changed in the digital world. According to Siu, we also buy things to create social identities, such as skins and clothing in certain games and weapons in others. With the metaverse in place, these products should be able to transcend game borders and be the purchaser's property on any platform in the metaverse. NFTs can also be seen as non-fungible self identifiers. When it comes down to the question of real and virtual value. Siu says: "Bored Ape is the same price as a Birkin bag. Same as the Bored Ape NFT, you're paying for an entirely virtual value with the Birkin. Everything you purchase today is 99% virtual value."

As we gain more control over digital assets and our digital identity, we cannot help but realise the metaverse has led us into a place where the internet is celebrating individual creativity. Technology has fused into our daily lives in ways more seamless than ever. It is no longer an extra school subject, a burden at work or an addicting leisure device. Instead, it has become a part of life, an added layer of self-identity and an extension of our intelligence and creativity. "We can unlock what is natural for us without the need of a computer." Siu says.

元宇宙有許多不確定性，但有一件事卻是可以肯定的：我們未來的網上生活絕不會是閉環、受控的專有系統。元宇宙內產生了一種新的網絡體驗，確認我們擁有個人資料的獨立權利。Animoca Brands聯合創辦人兼董事長蕭逸對此深信不疑。

Animoca Brands是一間專注於數碼娛樂和區塊鏈遊戲的香港公司。它由傳統遊戲公司起家，很快便進入了高速發展的區塊鏈經濟市場中。目前，它旗下有超過150間區塊鏈相關公司，包括Opensea、the Sandbox和CryptoKitties。

蕭逸認為，VR和AR等流行的遊戲技術只是體驗數碼世界的不同方式，元宇宙的核心在於數據，和怎樣得到和擁有這項世上最有價值的資源。

大多數人每天都會上網，甚至從一早醒來直至晚上睡覺之前都不能離開它。可想而知，每日製造出的數據量和能量是多麼龐大。然而，如果沒有區塊鏈和元宇宙，這些寶貴的數據的擁有權並不歸個人所有，而是屬於平台。

我們一向都無法擁有自己的網上數據，要拿回擁有權，好像是非常陌生。然而，正如蕭逸所說：「數碼資產也可以傳承，與現實世界的資產無異。」數碼資產的去中心化確保你的數據不會在違背自己的意願下被使用或操縱。社交媒體平台將不再有權刪除你的帳戶或阻止你修改自己的數據。

在現實世界，我們都有自己的身份，並會透過不斷購物，來建立心目中的自我形象。在虛擬世界亦如是，蕭逸表示，我們都會購買物品來建立身分地位，例如在遊戲中購買特有的造型、服裝或武器。有了元宇宙，這些產品應該能夠超越遊戲的界別，成為購買者在元宇宙任何平台上的資產。NFT也可以被視為一種不可替代的身分識別元素。當問到涉及真實和虛擬價值的問題時，蕭逸說：「Bored Ape的NFT作品與一個Birkin手袋價格相當。雖然手袋是真實物品，但其實它的價值和Bored Ape NFT一樣都是虛擬的。你現在購買的任何東西，99%都是虛擬價值。」

隨著我們掌握更多數碼資產和數碼身份的控制權，我們很自然地便會意識到元宇宙已將我們帶領到一個重視個人創意的網絡時代。科技以前所未有的方式與我們的生活無縫銜接：它不再是額外的學校科目、工作中的負擔或令人上癮的娛樂活動，而是真正成為我們生活的一部分、自我認同及延伸智慧和創造力的額外層次。蕭逸說：「我們可在不需要電腦的情況下，釋放我們原本擁有的東西。」

Why Digital Materials are Critical to the Future of Fashion
數碼物料對未來時尚界的重要性

Jørgen Sevild

Director of Business Development and Client Strategy, INQOVA

INQOVA 業務發展和客戶戰略總監

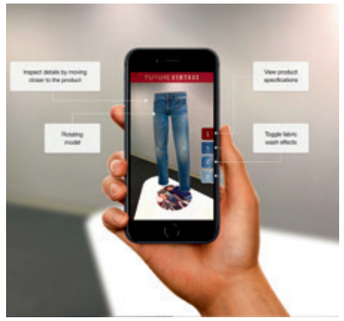
Jørgen Sevild, Director of Business Development and Client Strategy at INQOVA, believes digitisation is inevitable in the field of fashion and technologies should be accessible to all in the industry.

Before tapping into the field of fabric and material digitisation, Sevild was keen on making digital denim models. With an education background in engineering and professional experience in denim manufacturing, Sevild began experimenting with the idea of constructing 3D denim models digitally with photogrammetry, a technology stitching hundreds of images together to render models. He even got his pair of digital jeans to dance. Soon, he found himself in a situation of playing with the 3D creation alone and unable to make any actual contributions to the industry.

The gap between the learning and self-exploration of technology and industry demands is what students, fresh graduates and even seasoned designers and entrepreneurs could face any day in their work. Instead of stubbornly holding on to the dancing denim, Sevild decided to dig deeper and find out what was really needed in the industry and how to make them better with technology. Knowing that the move to digital was inevitable in the fashion industry, Sevild closely examined how the industry worked, and detected the needs for digitised fibre and fabric.

Through his research, Sevild found out that many physical garment samples produced by design students and designers eventually go to waste. It also leads to waste of capital and time if the fabric sample ordered was not what the designer expected. To solve these issues, Sevild proposed a digitised database for fabric samples, where the full information of each fabric is readily available paired with high quality images or scanning of the fabric. This not only increases the accuracy of orders but also contributes to higher qualities in digital sample renderings.

Sevild also emphasises on the accessibility of 3D technology in the industry. In his opinion, these technologies should never be dreadful terms we see in research papers, but rather hands-on tools every designer can adopt if they wish to, and they all should.



In one of the technologies that Sevild introduced in his talk, a physically based rendering can be formed online with the help of any type of camera, a flash and a computer. Designers can then use the renderings on their 3D models to create a model closer to their vision.

Innovative technologies have long existed in academia and research facilities, but now, more than ever, we should encourage accessible technologies in every other field in life. Jørgen Sevild is leading that change in the field of fashion.

INQOVA業務發展和客戶戰略總監Jørgen Sevild相信，數碼化是時尚界不可避免的趨勢，而業界所有人都應該可以應用此技術。

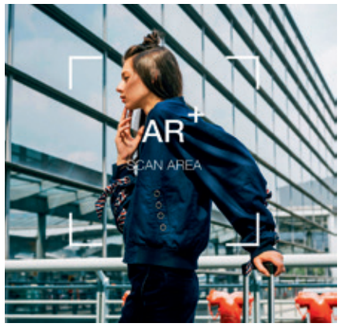
在涉足物料數碼化領域之前，Sevild熱衷於製作牛仔服飾數碼模型。憑藉其工程的教育背景和生產牛仔布料的專業經驗，Sevild嘗試透過攝影測量法，以數碼方式製作3D牛仔服飾模型，甚至有一條可以跳舞的數碼牛仔褲。但他很快就發現這些3D創作只限於自己的玩樂，無法為業界作出實質的貢獻。

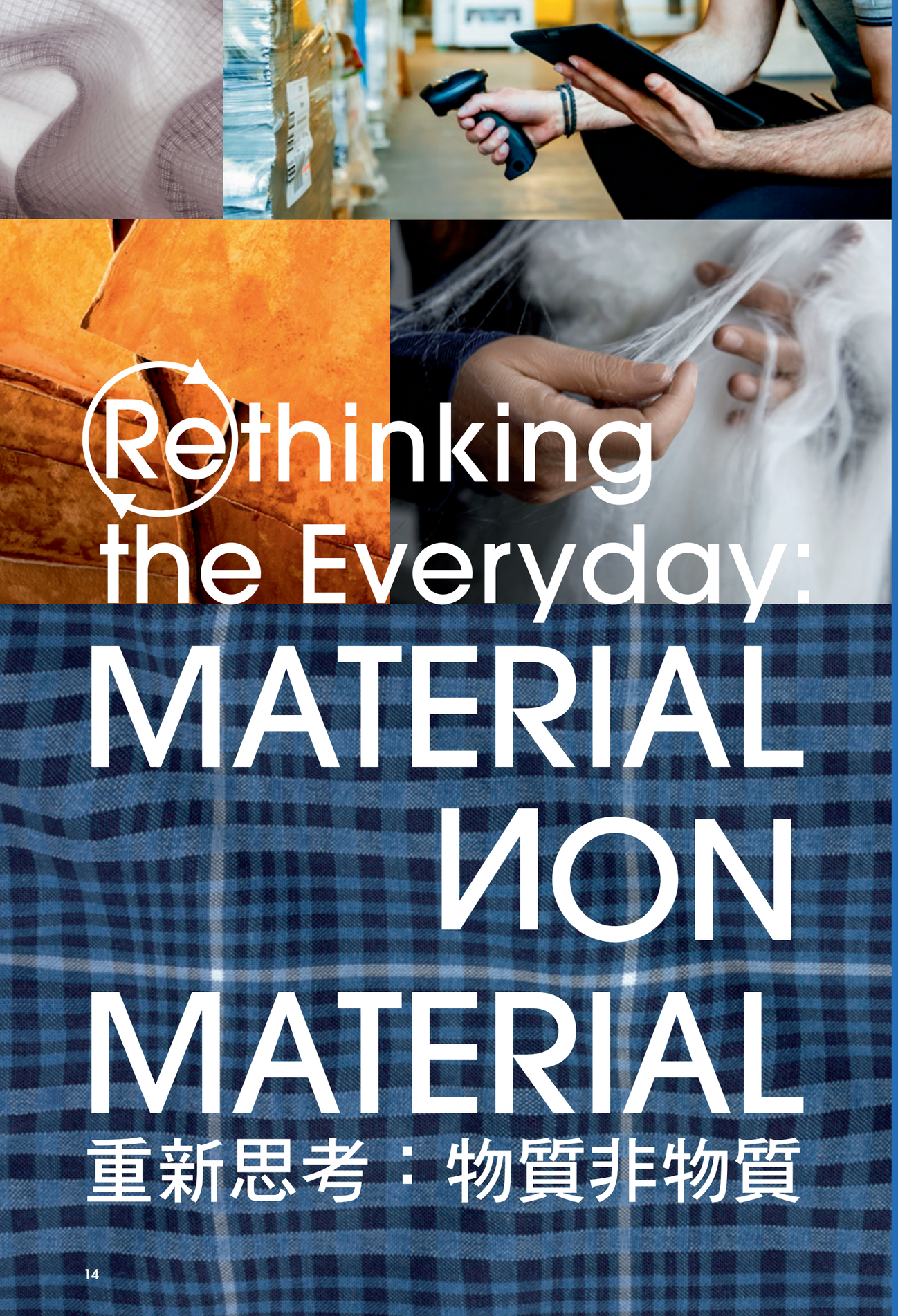
這條在學習和自行探索與業界需求之間的科技鴻溝，是很多設計系學生、應屆畢業生，甚至是經驗豐富的設計師和企業家都會面對的問題。Sevild沒有沉醉於他那跳舞的牛仔褲，而是決定深入探討業界的真正需要，以及如何利用科技加以改善。他深知時尚界無可避免會走向數碼化，因此便仔細研究整個行業的運作模式，從而發現了業界對數碼織維和布料的需求。

經研究後，Sevild發現設計系學生和設計師製作的許多實物服裝樣品最終都會被丟棄，而如果訂購的面料樣品未如設計師所想，也會浪費金錢和時間。為了解決這些問題，Sevild建立了一個布料樣品數碼資源庫，列出每種布料的完整資訊，配以高清圖像或布料掃描作參考。這樣不僅令訂單更加準確，而且有助於提升數碼樣本效果圖的質量。

Sevild也十分重視業界是否容易接觸到3D技術。他認為這些技術絕不應像在研究論文中看到的可怕術語，而是要讓每個設計師都易於使用。他在演講中介紹了一項技術，可以使用任何類型的相機、閃光燈和電腦在網上做到實物效果圖，之後設計師就能放在他們的3D模型上，製作成接近他們想法的模型。

創新的科技早已存在於學術界和研究機構中，但現在我們更應該鼓勵這些科技以親民的形式走進生活中各個領域。Jørgen Sevild 正在時尚界引領著這個轉變。





Rethinking the Everyday: MATERIAL NON MATERIAL

重新思考：物質非物質

Technology constantly brings into question our attachment to a particular material or object. What may have once been commonplace, even indispensable, can suddenly disappear before a superior technology. Just as the abacus and telegram fell by the wayside, present day materials based on non-renewable resources will be overtaken by more advanced replacements. Substituting problematic materials with better alternatives has a definite environmental upside. So too for migrating materials from a physical to a non-physical form, which will help better preserve diminishing resources. All cause for optimism about the future state of materials in our lives.

While technical advances are driving change, designers need to be included at the coalface of development to optimise results of these changes underway. The stories in this issue progress from more conventional technological developments in the substance of material, to the frontier of materials as interfaces between people, products, and the surrounding environment. Divided into three areas, material, inter-material, and non material, the following stories highlight the role technology plays in reshaping our conceptions of material substance, and how the lines between what is material and what is not, is becoming increasingly blurred and interwoven.

The first story, MycoWorks, takes us to the frontier of organic fabric development, where the humble mushroom is creating a class of material that promises both luxury and utility in abundance. Next comes Spinnova, which introduces an eco-fabric made from waste resources that promises to eventually side-line many of the environmentally destructive practices used in making conventional garment materials. An interview with Dr. Claire Sand, sheds light on the fundamental changes underway in the packaging industry, and the potential for smart packaging to redefine how a product transitions throughout its lifecycle. Another interview, this time with fabric digitisation expert Jørgen Sevild, explores the future of digital fabrics and garments as the industry moves toward virtual design mediums. The final story, Ability Hand, focuses on advances in prosthetic development, and a new world of sensory perception it enables for those in need.

When looked on as a total, these stories emphasise that the boundaries between the material and non-material aspects of our lives will continue to be blurred. Something that makes the keen eye and intuitive sense of a designer evermore important as we strive to create the best possible union of form and function in pursuit of a better future for all.

科技不斷讓我們思考某一特定物料或事物。曾經司空見慣，甚至是不可或缺的東西，在先進的科技面前都可能會突然消失。正如算盤和電報被淘汰一樣，如今以不可再生資源製造的物料，將被更先進的替代品所取代。用更優良的替代品取代有問題的物料，對環境絕對有好處。將物料從實體形式轉移到非實體形式亦有其好處，亦更能保護被日益消耗的資源。這一切的發展，都讓我們對日常生活中的未來物料感到樂觀。

在科技進步帶來變革的同時，設計師需要參與其中，以優化這些進行中的變革。本期故事涵蓋了從較為傳統的物料物質科技發展，到物料作為人、產品和周遭環境之間的連繫。故事劃分為物質、中間物質和非物質三個領域，闡述了科技在重塑我們對材料物質認知中所起的作用，以及物質與非物質之間的分界如何變得越來越模糊，但又互相交織。

在第一個故事裡，MycoWorks 將我們帶到了有機布料開發的最前線，看看毫不起眼的蘑菇怎樣創造出既奢華又實用的物料。接著是 Spinnova，它引入了一種由廢棄資源製成的生態布料，有望最終消除製造傳統服裝物料時對環境造成的破壞。而 Claire Sand 博士的人物專訪，便揭示了包裝行業正在發生的根本性變化，以及智能包裝重新定義產品如何在生命週期中轉變。另一篇是布料數碼化專家 Jørgen Sevild 的專訪，探討了業界在朝向虛擬設計媒介發展的背景下，數碼布料和服裝的未來。最後，Ability Hand 的故事討論了義肢技術開發的進展，以及如何為有需要的人帶來感官新世界。

總體而言，這些故事都在告訴我們，生活中物質和非物質之間的界線會繼續模糊下去。在我們努力將形式和功能結合成最佳狀態，以追求更美好的將來時，設計師的敏銳眼光和直覺便顯得尤其重要。

Fungi Stakes a Claim in the Luxury Market

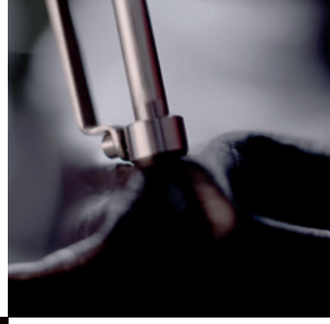
真菌進佔奢侈品市場

Text by Steve Jarvis Photographs courtesy of MycoWorks

When your company's first "alternative leather" product is released in partnership with iconic leatherware brand Hermès, it is an indication that fungi has serious credentials in the luxury fashion industry. Success has been decades in the making, but the people at MycoWorks are convinced they have developed a technology that will push the envelope of sustainable fashion.

如果你公司的首個「皮革替代品」產品能夠與奢華皮革品牌 Hermès 合作和共同發布，這便證明了真菌已經在奢侈時尚界佔一席位。成功需要數十年的努力，然而，MycoWorks 的團隊相信，他們已經開發出一種可以突破可持續時裝發展的科技。

This new material uses traditional methods of tanning and leather craft to achieve its finished product
這種新物料使用傳統的鞣製和皮革工藝來製成產品



The default image of a mushroom in most people's minds is some variation of a cap and a stem attached to a tree or coming out of the ground. Though, technically, this is actually just the fruit of a much larger fungal organism that is mostly hidden from view, buried beneath the ground, or within some other host material. The unseen body of the fungi is called mycelium, a dense substance that grows via a web of tiny fibrous filaments that meld with a host material. Mycelium's low profile is on the rise, especially amongst major fashion brands looking to diversify into environmentally sustainable materials.

Mushrooms have long been valued for their nutritional and medicinal properties. Now mycelium, with its dense yet lightweight and robust characteristics, is getting attention as an entirely compostable substitute for styrofoam packing, as a versatile building material, and as an environmentally friendly fabric. Actually, compressing the thick white body of a mycelium can produce a passable alternative to leather, though it suffers in comparison to real leather, or even a synthetic leather substitute. That is, until MycoWorks started producing a mycelium leather-like material that goes beyond what can be expected.

The "mushroom leather" MycoWorks produces is a step beyond its compressed equivalent, and in some respects even real leather, to the point the company bills its product as a completely new class of material. The sustainability merits of fungi are well established. With rapid spawning and growth cycles, it is almost infinitely reproducible, it can grow in a wide variety of host bio-mass material, including agricultural by-products, and requires low processing inputs. However, it is in MycoWorks' patented mycelium growing process, known as Fine Mycelium, that really sets their product apart.

Technology that directs growth patterns

The Fine Mycelium process engineers the mycelium, directing the growth of the root fibres to create a proprietary cellular structure that is densely entwined. MycoWorks compares their mycelium material "to the tight, triple helix of collagen, that mimics the structure of skin and many of its qualities." According to the company, "their Mycelium material is as strong, flexible, and durable, as conventional leathers, and because it is made from natural fibres it breathes and feels like leather. Even better, it is also naturally water-resistant."

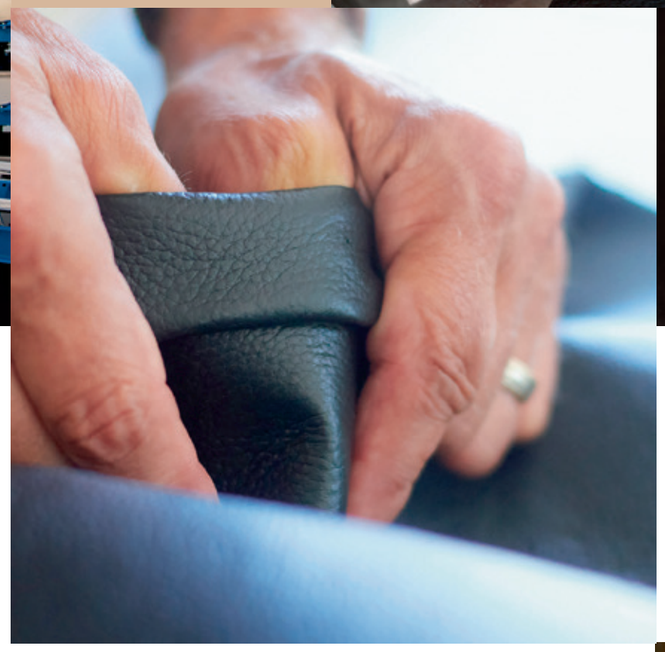
Conventional leather procssing comes with a range of problems, including environmental cost of raising livestock and treating hides with chemicals to produce leather. However, there are more prosaic limitations, such as irregular shapes inherent with hide, and the wastage that comes with cutting to design. MycoWorks comes without such downsides, "The leather is uniquely customisable. It can grow textures and other features right into the material. And, unlike animal hides, the material can be grown to nearly any size and shape. It also only takes a fraction of the time and resources to grow when compared to the processes needed to make leather from animal hides."

The technology holds great potential as a fashion material because the softness, drape, thickness, shape, texture, flexibility, strength and density are all specifications that can be predetermined by designers. MycoWorks claims their product "provides a revolutionary advantage that gives designers full creative control, minimises waste and offers the industry the first made-to-order, high performance, sustainable option for leather." Moreover, it can be tanned, cured, stitched and embossed, allowing it to be treated like any other high-end leather material.

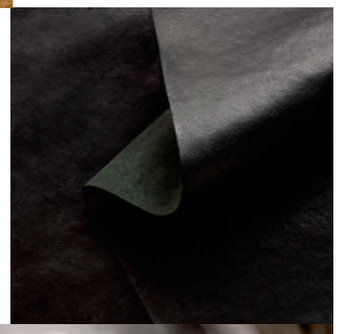
High fashion partnerships underway

Given this set of qualities, it is understandable that MycoWorks has attracted attention in the fashion industry, and the company is in the process of working out partnerships with leading brand names. Case in point, a collaboration between MycoWorks and Hermès has led to the first Fine Mycelium-created material "Sylvania." Grown to specifications in MycoWorks' California factory, Sylvania is tanned and finished in France by the Hermès tanners to further refine its strength and durability, and it is shaped in the workshops by the Hermès craftspeople. End result, the "Victoria" bag, which was featured in Hermès' autumn-winter 2021 collection.

Mycelium is grown in trays in highly sanitary facilities
菌絲體於高規格衛生防護標準的環境中培育



As strong as leather and just as versatile
猶如皮革一樣堅固結實，而且用途廣泛。



Hermès 2021 Collection's Victoria bag
Hermès 2021 系列中的 Victoria 手袋

It is no accident that MycoWorks is seeing success at the high-end of the fashion market, as it was a conscious decision by the company to pursue the luxury market. MycoWorks was founded in 2013 by Philip Ross and Sophia Wang. Ross, an established artist using the medium of living materials, had been working with mycelium to create sculptures since the 1990s. When he asked Wang, his long-time artistic collaborator, to launch a company with him, the pair initially considered using mycelium in its rigid form as a source for natural building materials. Though, they soon realised the realm of sustainable fashion had even greater potential. Wang elaborates:

"We were looking at building materials because the art objects had demonstrated that's what you could make. But as a small company, the per-unit cost of competing with something like an engineered wood product or styrofoam is really challenging. You'd have to solve insane volumes for the margin. But with fashion, making a high-value, beautiful object of desire made sense with what we were offering."

Being artists and founders helped with creating an aesthetic dimension for Fine Mycelium, something Wang thinks distinguishes MycoWorks in the fast-growing sustainable fashion sector. Many start-ups in this sector have technology roots, making it necessary to find and interact with experts and clients outside their field. Contrastingly, MycoWorks started from aesthetics with technical experience. After eight years of product development, several rounds of venture funding, and boosting their team with engineers, biologists, material scientists, and leather craftsmen, MycoWorks has created an integrated value chain for their material that can get unique materials to the market quickly.

MycoWorks believes their artistic experience, patented technology, and level of integration are strong points of difference to competitors working with mycelium in the sustainable fashion sector. This may be so, but between the annual sales of leather products, estimated at USD$150 billion and an estimated USD$8 billion market for ethical fashion by 2023, there is a lot of opportunity for growth for mycelium products, regardless of which company is selling the product. By extension, there are equally good prospects for designers wanting to flex their creativity in this fast-growing field.

大多數人對蘑菇的印象是它們有不同類型的菇傘和菇莖，通常是附在樹上或從地裡長出來。不過嚴格來說，蘑菇其實只是一種大型、埋於地下或存於其他宿主中，常常隱藏起來的真菌生物的果實。蘑菇那看不見的主體稱為菌絲體，是一種與宿主融合、稠密的微小網狀物質。雖然菌絲體低調，又常隱藏於人前，但它的地位，特別是在各大時裝品牌中，正持續上升，因為這些品牌都正在尋求多元，並陸續使用環保可持續物料。

長久以來，蘑菇因其營養和藥用價值而備受重視。現在，菌絲體以其濃密、輕盈而堅固的特性而漸漸受到注目。它不們可以作為發泡膠包裝用品的完全可堆肥替代品，還可用作多功能建築物料和環保布料。事實上，壓縮厚厚的白色菌絲體可以生產出一種皮革替代品，儘管它與真皮，甚至是合成皮革相比，仍然是稍遜一籌。直到MycoWorks開始用菌絲體生產皮革替代品，令人驚喜。

MycoWorks生產的「蘑菇皮革」比同類型的壓縮皮革更為優勝，在某些方面甚至比真皮更佳，亦因如此，公司將它稱為一種全新的物料。真菌的可持續性是公認的，憑藉快速的繁殖和生長周期，它幾乎可以無限量生產，又可在農業副產品等多種生物質宿主中生長，在生產過程中的輸入極低。然而，真正讓MycoWorks的產品與眾不同的，是其專利菌絲體生長過程，一個名為「Fine Mycelium」的專利工藝。

增長模式技術

Fine Mycelium專利工藝培育出優質菌絲體，使根纖維生長，從而建立緊密和牢固的微孔結構。MycoWorks表示，菌絲體物料在仿皮膚結構和其他特質上能與膠原蛋白的穩固三鏈螺旋結構相媲美。公司生產的菌絲體物料與傳統皮革一樣堅固、靈活和耐用，由於它是以天然纖維製成，所以它的透氣性和觸感都如皮革一樣。更好的是，它還具有天然的防水功能。

傳統皮革存在不少問題，包括飼養牲畜和生產皮革要使用化學品處理獸皮製作等眾所周知的環境成本。不過，實際上它還有很多限制，例如是獸皮的形狀不規則，以及設計時剪裁所產生的浪費等。MycoWorks的皮革則沒有這些缺點：「皮革可以客製化。它可以直接在物料中使用特定的質地和加入其他特點。與獸皮不同，這種物料幾乎可以生產成任何尺寸和形狀。生產我們的皮革所需的時間和資源，對比起用獸皮製造的皮革，只是它們的一小部分而已。」

生產這種時尚物料的技術大有潛力，設計師可以預先確定柔軟度、皺褶、厚度、形狀、質地、柔韌度、強度和密度等所有規格。MycoWorks聲稱他們的產品「提供了革命性的優勢，使設計師能夠完全掌控創意，把浪費減至最少，並為業界提供首個客製化、高性能和可持續的皮革選擇。」此外，它也可以像任何其他高級皮革一樣進行鞣製、浸酸、縫線和壓花等工序。

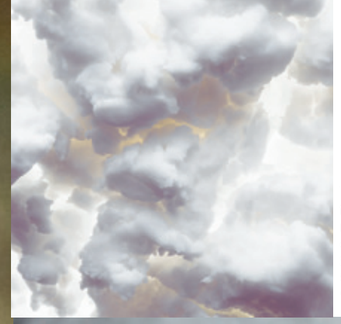
與高級時裝合作進行中

基於這種新皮革的特質，MycoWorks輕易地在時尚界受到歡迎。公司現正與業界各個頂尖品牌建立合作夥伴關係，當中一個最好的例子就是與Hermès合作，推出首個由Fine Mycelium所製、供Hermès獨家使用的物料「Sylvania」。Sylvania在MycoWorks的加州工廠按規格生產，其後由Hermès的製革匠在法國鞣製和拋光，以進一步提高其強度和耐用性，接著由Hermès的工匠在工坊塑形。最終成品就是出現於Hermès 2021秋冬系列中的「Victoria」手袋。

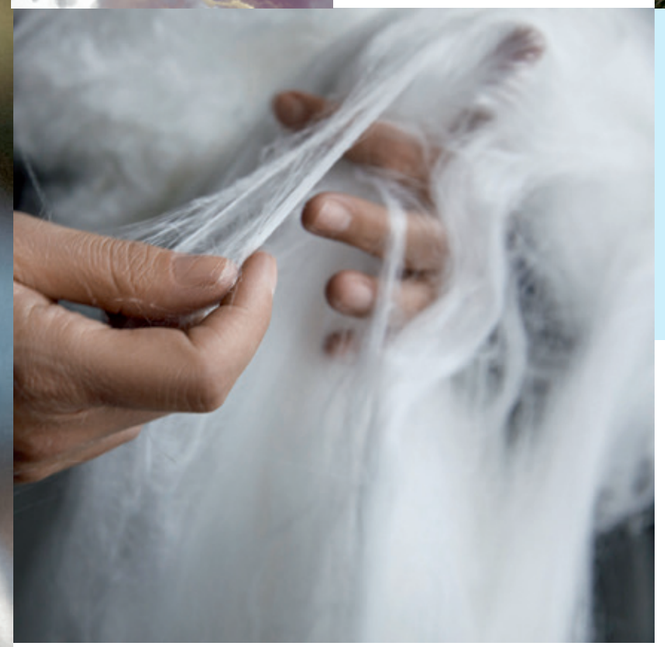
MycoWorks在高級時尚市場取得空前成功絕非偶然，公司是特意想進軍奢侈品市場的。MycoWorks由Philip Ross和Sophia Wang於2013年創立。Ross是一位以有生命的物料作為媒介的知名藝術家，自1990年代以來一直使用菌絲體創作雕塑。當他邀請長期合作的藝術夥伴Wang與他一起成立一家公司時，兩人最初考慮業務以菌絲體固有的形式，作為天然建築物料的原料。不過，他們很快便意識到可持續時尚領域具有更大的潛力。Wang解釋道：「我們考慮過建築物料，因為創作藝術品已經證明這是可行的。但作為一家規模細小的公司，菌絲體與生產複合木製品或發泡膠的單位成本相比，實在很難和它們競爭，我們必須大量生產才可獲得利潤。但是在時尚行業，我們提供的物料製作高價值而漂亮的產品則更有效益。」

Wang認為身兼藝術家和公司創辦人，有助Fine Mycelium建立美學維度，使MycoWorks在迅速發展的可持續時尚業界脫穎而出。許多初創企業在這個行業中都以技術為本，因此，他們必須尋找業界以外的專家和客戶交流。相比之下，MycoWorks以美學和技術經驗起家，經過八年的產品研發、幾輪的創業投資，以及在團隊中加入工程師、生物學家、物料科學家和皮革工匠，MycoWorks為其物料創建了一個綜合的價值鏈，可以將獨特的物料快速推向市場。

MycoWorks相信比起其他在可持續時尚行業中使用菌絲體的競爭對手，他們的強項在於藝術經驗、專利技術和整合程度。也許確實如此，但比較年銷售額預計達1500億美元的皮革產品市場以及預計至2023年達80億美元的道德時尚市場，無論是哪家公司銷售的菌絲體產品都仍有極大的增長空間。由此推之，對於希望在這個快速發展的行業一展拳腳的設計師來說，同樣會擁有一片光明的前景。



The stages of Spinnova, from filament, to spun material, as a garment, and in everyday use.
Spinnova 從細絲到紡紗物料，再成為服裝和作日常使用的各個階段。



Spider-Inspired Eco-Fabric

靈感源自蜘蛛的環保面料

Text by Steve Jarvis Photographs courtesy of Spinnova

Spinnova is made with minimal water, no harmful chemicals, produces zero micro-plastics, and is fully up-cyclable—the future of textiles may have just arrived.

Spinnova 以極少水量製成，不含有害化學物及微塑料，並且可升級再造 — 這可能是紡織品的未來。

It would raise no eyebrows to have a closet made from wood, but what is hanging inside it, well, that has to be a different material, right? The innovative people at Spinnova are set to redefine wood as something you wear. Don't worry, you won't be wearing plywood sheets out on the town, but to expect a lush textile draping over your contours instead.

Finnish company Spinnova has developed a 100% natural wood-based textile made completely from raw wood pulp. The raw material is first refined without harmful chemicals, next spun into a filament, and finally extruded at high pressure through a spinning nozzle to create a strong and natural-feeling textile fibre. The fibre, called Spinnova, is then spun into yarn that has the "stretch and strength of cotton and the insulation of lamb's wool."

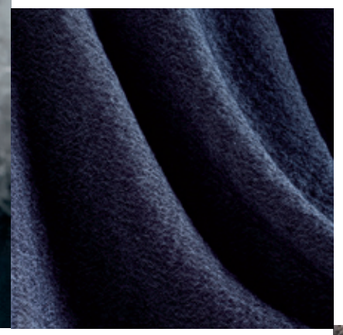
Finnish cellulose researcher Juha Salmela first hit upon the idea after attending an academic presentation on spiders in 2009. It proved inspirational. His method combines the fibrous properties of cellulose with a spinning process similar to that of a spider web that is inherently strong and flexible. Juha and his team have created a new type of fibre of excellent quality, one that is not only cost-efficient, but also industry-leading in its environmental sustainability. Spinnova is a material that could well revolutionise the textiles industry.

For now, Spinnova uses wood pulp as its primary raw material. It is the same type of wood pulp used to make paper, and all the trees used in the process are sourced from certified sustainable forestry operations. Importantly though, Spinnova's fibre can be made from any kind of cellulose, and they are currently trialing fibre created from waste biomass, and a wide variety of raw materials, including agricultural by-product such as straw, and other waste material including textile waste.

The company was founded with the goal of becoming the world's most popular sustainable material, and creating a product that actually saves more CO_2 than it produces means they are well on track to achieving their goal.
To further reduce the environmental problems found in traditional textile production, they are researching the possibilities of using post-consumer cotton as a raw material, giving a completely new life to the mountains of discarded clothes generated by the fast fashion industry. Replacing cotton is a critical issue for the textile industry, as it uses an enormous amount of water and polluting chemicals in the production process.

Spinnova is a standout alternative to cotton. The contrast is stark, it consumes only a tiny fraction of the amount of water in production, uses no harmful chemicals, and is able to be reprocessed several times without any loss of quality. When compared to cotton, there is an enormous difference in the CO_2 emissions required to manufacture the material, presenting not only an environmental gain, but also a significant cost saving for an industry that operates on tight margins.

Spinnova is as soft as cotton, and just as versatile in garments.
Spinnova 像棉花一樣柔軟，在服裝上也用途廣泛。



Spinnova is actively collaborating with major brands to promote industry acceptance for their material. Interest has been strong, quickly attracting an impressive number of major brands including H&M, Adidas, and Marimekko, companies that are increasingly conscious of the environmental costs of cotton and are actively searching for an environmentally sustainable alternative.

In cooperation with partner companies, Spinnova aims to produce one million tons of material by 2031. Confident of the scalability of their production process, the company is preparing for a rapid spike in demand as consumers want to buy evermore sustainable products. With proven technology, a successful IPO, and fashion brands lining up to be involved, the company is well positioned to be one of the strongest alternative materials in the rapidly expanding market for sustainable textiles.

用木材製成衣櫃應該不會引起你的注意，但如果裏面掛著的衣服也是用木材製造，那會否顛覆你的想像？創新的Spinnova以木材重新定義服飾 — 別擔心，你穿上的不是一塊塊硬梆埆的木板，而是豐富多樣，體貼身形的紡織品。

來自芬蘭的纖維技術公司Spinnova開發了一種由100% 全天然木漿製成的木質紡織材料。公司以專利技術紡絲，在原材料提煉過程中不需經過有害的化學品的處理，可直接將木漿紡製成細絲，再通過噴嘴在高壓下擠出，形成強韌而富有自然感的紡織纖維。這種名為Spinnova的纖維經過紡紗等工序後，會成為猶如棉花一樣具彈性和強度的隔熱羊毛狀材料。

來自芬蘭的纖維素研究者Juha Salmela，在 2009 年參加了一次關於蜘蛛的學術演示後得到啟發，萌生了一個全新的想法 — 他發現纖維素與蜘蛛網蛋白非常相似，兼具高強度和高韌性便與他的團隊將兩者的特質結合，創造了這種品質卓越的新型纖維，不僅具有成本效益，在環境可持續性方面也處於業界領先地位。Spinnova物料徹底革新了紡織行業。

Spinnova 使用木漿作為其主要原材料，與造紙的木漿屬相同類型，而且製作過程中所使用的木材均來自經認證的可持續森林。最重要的是，Spinnova 的纖維可以由任何種類的纖維素製成。團隊目前正在試驗由廢棄物生物質和各種原材料，包括稻草等農業副產品，以及紡織廢料等含纖維素的材料所製成的纖維。

Spinnova的目標是生產世界上最受歡迎的可持續材料，並希望所製造的產品可以減少碳排放，公司現在正朝著這個方向邁進。為了進一步減少傳統紡織品生產中所衍生的環境問題，他們積極研究使以用過的棉花物料作為原材料的可能性，讓快時尚行業所產生的大量廢棄服裝得以重生。由於棉花在生產過程中往往使用了大量的水和產生污染環境的化學品，因此取代棉花是當前紡織行業所面臨的一個重要議題。

Spinnova 物料是極佳的棉花替代品，在生產過程中用水極少，不會用到有害化學物質，並且能夠多次重新處理而不會降低質量，與棉花形成強烈對比。加上製造這種材料所產生的碳排放量與棉花相比亦大幅減少，不僅能帶來環保效益，也能為利潤微薄的業界顯著地降低成本。

此外，Spinnova同時積極與各大著名品牌合作，提升業界對其開發的新興材料的接受程度，成功在短時間內吸引了多個品牌的注意，包括 H&M、Adidas和Marimekko等。這些品牌都逐漸意識到使用棉花所帶來的環境成本，因而積極尋找具持續性的環保替代品。

Spinnova與合作伙伴的目標是到2031年，每年生產100萬噸物料，他們對擴展其生產過程充滿信心，並就市場對可持續產品快速增長的需求做好充分準備。憑藉成熟的技術，他們成功首次公開招股，並陸續準備與時尚品牌合作，可望於快速擴張的可持續紡織市場中，成為最強大的可持續替代物料公司之一。

Spinnova is light and breatheable, making it a sensible choice for outdoor use.
Spinnova 輕便透氣，於戶外使用是明智的選擇。

The inventor of Spinnova, Juha Salmela
Spinnova 的發明者 Juha Salmela

Inter Material

Labelling to ensure appropriate handling
加上標籤以確保處理恰當

A Step Beyond Wrapping Products

不只是包裝這麼簡單

Text by Steve Jarvis Photographs courtesy of Evigence Sensors

For all its ubiquity and diversity, product packaging doesn't get the attention it deserves. What attention it does get is usually negative, and for good reason, as plastic packaging is choking the world's waterways and wreaking havoc on delicate ecosystems. However, there are important developments underway in the world of packaging, and we talk to industry thought leader Dr. Claire Sand to discover what is on the horizon for the humble product package.

產品包裝現今無處不在，亦非常多元化，但似乎沒有人留意到它的重要。人們對包裝的看法，往往都是比較負面的，原因包括塑膠包裝會阻塞水道，對脆弱的生態系統又會造成嚴重的破壞。然而，在包裝領域裡正發生重要的改變，我們訪問了業界的專家 Claire Sand 博士，探索這看來豪不起眼的產品包裝的前景。

Even after three decades in the industry, academic and consultant Dr. Claire Sand is clearly excited about the future of packaging. "Materials is a really fun area to be in right now, precisely because there is so much going on. In terms of the value chain, supply chain problems caused by numerous crises and the COVID-19 pandemic are forcing companies to adopt contingency materials to cater for shortfalls and supply problems. These external stimuli are helping the industry to change and speeding up the adoption of higher performance packaging."

Sand points to a one-third increase in polymer prices in 2021, "Which prompted companies to save money on production costs by increasing filler material, such as starch, enabling them to reduce the amount of polymers needed to make PET bottles. I think economics is driving the increased use of alternative and sustainable technologies very rapidly." However, economic incentives have limits, and Sand does not shy away from the problems packaging is creating, something especially obvious in food packaging.

"Nearly one-third of all food produced ends up in the waste system. What makes it worse, the vast majority of it is thrown away at the end of the supply chain after all the value-processing, packaging, and distribution has been added." She is also quick to note that reducing this waste and increasing the amount of recycled and recyclable packaging is difficult precisely because the food system is set up to produce 30% more food than is being consumed. Sand elaborates on the dynamics behind this situation:

"If you are a farmer, and you find out you will lose 30% of your income, you are not going to be happy about that. Brands have done a great job in reducing waste in the production side of the equation because it directly comes out of their bottom line. But when it comes to reducing wastage in the hands of the consumer, incentives are just not as strong because they directly affect the production value chain. Although, recent food price increases should encourage consumers to make the switch to packaging that is proven to extend the shelf life of the food."

"Given this economic disincentive within the food system, it will take a cultural change in society to increase recycling rates. We need people to expect better packaging, and demand fewer points of friction when they try to recycle," said Sand. "However, the packaging industry also needs to step up to make packaging more sustainable, more effective at its job, and easier to recycle. There needs to be a systems-level change to make this happen, and the industry needs to be better at doing its job of protecting and tracking the products we use."

Temperature and time sensitive labels will change inventory management and bring savings to consumers
對溫度和時間敏感的標籤，將改變庫存管理，並為消費者節省金錢。

Smart packaging is active and intelligent

Enter "smart packaging", an amalgam of technologies that together promise to create packaging that better caters to the needs of consumers while also reducing its negative effect on the environment. Active and intelligent packaging are two forms of smart packaging.

Active packaging employs technology that intentionally releases into or absorbs compounds from the food or the headspace of food packaging. These actions extend the shelf life of products by stalling the degradative reactions of lipid oxidation, microbial growth, and moisture loss. "As active packaging becomes more mainstream, even more innovation and application will become possible as the technology is increasingly refined to protect brand integrity and extend food shelf life. Active packaging technology is on the cusp of enabling personalisation of food just before eating, and increasing manufacturing agility. Also, we are starting to see packaging that deliver nutrients, flavours, odours, textures, and colours in response to environmental conditions, time, or consumer interaction."

"On the other hand, intelligent packaging communicates to consumers and others throughout the value chain, from food manufacturers, distributors, retailers, consumers, to post-consumer package handlers. Freshness indicators are used in some intelligent packages to communicate the shelf life of products within the value chain – for example from blueberry farms to grocery distribution centres. However, because so much food waste occurs after the purchase of food products, it is essential to ensure that freshness indicators can also communicate to consumers. The use of freshness indicators that indicate shelf life after opening and current freshness can be expanded to decrease food waste and increase the value of packaging."

"It is now possible to do so much with packaging, including all the active and intelligent options, but the next level could be to also use packaging as a communications device to the consumer to tell them how to recycle the package, and how they could possibly benefit from doing this correctly. It is possible to even track all aspects of the recycling and make it into a competition amongst friends and neighbours to improve the recycling rates."

Sand is optimistic that technology will soon push communicative packaging to the next level. "We have been able to print RFID tags, etc. for a long time, but the real game-changer in this area is being able to print packaging that includes a thin-film battery, essentially they are printing a battery on paper. This research is now advancing rapidly and is attracting a lot of interest within the packaging industry."

The label changes in response to time and temperature change
標籤會隨著時間和溫度改變而變化

The future is integrated packaging

For Sand, integration is the most exciting thing happening in packaging right now. "We are really good at active packaging, and have been using it for a long time and there are lots of great innovations. With intelligent packaging, we are communicating things like temperature, what temperatures a product has been exposed to, and how this is related to potential dangers from microbes. Linking the two together presents tremendous opportunities for the future."

This integration of packaging is starting to be referred to as the Internet of Packaging (IoP). "It holds incredible opportunities, primary of which is a fully integrated value chain. When we have this, not only can we record specifics such as location and harvesting details, but also the nutritional breakdown of the contents of that individual container. Moreover, it is all trackable and traceable. I believe the potential for IoP is profound because it connects all this data to help create a more sustainable packaging system for the entire value chain."

While much of the technology is already here, Sand notes "It is the actual adoption of more sustainable materials, technologies, and especially consumer action that need to be better addressed." She goes further to identify the largest stumbling block, "The number one thing is waste collection. It may sound strange, but it is true. There are amazing technologies and material science out there, great recycling facilities, and RFID technologies incorporated into the packaging, but it is for nought if we don't collect it. If recyclable material can't be collected, the value chain breaks down."

Designing for recycling is key

"We need to make consumers responsible for what they buy, not just the product, but also the packaging, and this responsibility is not being effectively communicated. One of the big trends we need to understand is "recycle ready", designing packaging to make it incredibly obvious to consumers how a package can be pulled apart and made ready for recycling. Brands are finally doing this, but the ultimate responsibility lies with the consumer, which is a fundamental area requiring action." She continues, "Collecting waste isn't sexy, but it is so important, and we need creativity in solving these problems."

Sand has a suggestion for designers, "It is critical that packaging designers are designing for recycling right from the very start. To do this successfully, it needs to be made so obvious to the consumer what action to take. In addition, it needs to be done for different types of consumers and economic brackets, and it requires consumer testing to work out what is really intuitive." She notes that health and beauty aids provide good examples of adaptation, and these once complicated high-end packaging products are now much easier to break down. Sadly, most other products have a long way to catch up.

Well aware of their role as an interface between producer and consumer, Sand issues a challenge to designers, "We need to design products that will encourage consumers to recycle. This is an emotional challenge, which can only succeed if we better connect with people's desire to help the environment. I think this is a truly worthy design challenge for our age."

即使已在業界工作了30年，身為學者和顧問的Claire Sand博士仍然對包裝行業的未來充滿憧憬。「正因為周圍有這麼多事情發生，物料領域變得非常有趣。在價值鏈上，由許多危機和新冠肺炎疫情引起的供應鏈問題，正迫使企業採用應急物料來應付短缺和供應相關的問題。這些外來的刺激正幫助業界改變，加速他們使用更高性能的包裝。」

Sand指出，2021年聚合物價格上漲了三分之一：「這促使企業通過增加使用如澱粉等填充物料來節省生產成本，從而令他們減少用於製造塑膠瓶的聚合物量。我認為經濟上的考慮因素正迅速推動替代性物料和可持續技術。」然而，經濟誘因是有其限制的。Sand並不回避包裝所帶來的問題，這一點在食品包裝方面尤為明顯。

「在所有生產的食物中，有近三分之一最終會被浪費。更糟糕的是，在經過加工、包裝和分銷的流程之後，絕大部分在供應鏈的最後一段就被丟棄了。」她還指出，減少這種浪費或是增加可回收和可循環使用包裝的數量都很困難，因為食物系統的生產量比消費量多出30%。Sand詳細闡述了這種情況背後的原因：

「如果你是一個農民，而你發現你將失去30%的收入，你是不會感到高興的。品牌在減少生產環節的浪費方面做得很好，因為這對會直接影響他們的利潤。但是當涉及到減少消費者層面上的浪費時，動機就沒有那麼強烈了，畢竟這直接影響到生產價值鏈。近期的食品價格上漲應該會令消費者轉買那些確實可以延長食品保質期的包裝。」

「鑑於在食物系統裡不利的經濟因素，要提升回收率，社會必須在文化上作出轉變。人們要期待更好的包裝，而且要減少他們在回收過程中遇到的阻礙。」Sand 說。「然而，包裝行業也需要更加努力，使包裝更具可持續性，並且更容易回收。這個目標需要在系統層面作出改變才能實現，更要好好保護和追蹤我們所使用的產品。」

智能包裝——活性包裝和智慧型包裝

「智能包裝」這個技術，一方面創造出更能滿足消費者需求的包裝，同時亦減少對環境的負面影響。智能包裝的形式包括活性包裝和智慧包裝兩種。

活性包裝藉著釋放或吸收食品與食品包裝空隙的化合物的技術，從而延遲脂質氧化、微生物生長和水分流失的降解反應，延長產品的保質期。「隨著活性包裝成為主流，保護品牌誠信和延長食品保質期方面的技術日益完善，更加創新和更多的應用便可得到發展。活性包裝技術在推動餐前食品個性化和靈敏生產模式極為重要。此外，我們開始看到根據不同環境因素、時間或消費者互動而發出不同的營養、味道、氣味、質地和顏色的包裝陸續出現。」

「另一方面，智慧包裝不單與消費者互動，還對整個價值鏈中的其他人從食物生產商、分銷商、零售商、消費者，到消費之後的包裝處理人員聯繫。有些智慧包裝使用了新鮮度指標，傳達價值鏈，如從藍莓農場到雜貨店分銷點的過程中產品的保質期，。然而，由於食品被購買後會出現大量浪費，因此讓消費者了解新鮮度指標也是很重要的。多利用能夠表示開封後及即時的新鮮度指標，可以減少浪費食物，亦能增加包裝的價值。」

「現在包裝能夠做到的，包括活性包裝和智慧包裝的事情有很多，下一步是包裝或許可作為一種與消費者溝通的媒介，告訴他們如何進行包裝回收，和讓他們知道正確回收對消費者本身又有什麼好處。我們甚至還能追蹤回收的每一個環節，將這成為朋友和鄰居之間的賽，以提高回收率。」

Sand相信科技很快會便會將互動性包裝推向一個新的水平。「我們能夠打印RFID之類的標籤已經有一段時間了。但是真正的變革，是能夠打印含薄膜電池的包裝，本質上是在紙上打印電池。這項研究正在快速進行中，並在包裝業界引起了高度的關注。」

整合包裝是未來的方向

對Sand來說，整合包裝就是當下令人興奮的趨勢。「我們在活性包裝上已經做得很好了，也做了很長時間，許多包裝也是非常創新的。智慧包裝可讓我們傳達不同信息，例如溫度、產品所處的溫度，以及怎樣的溫度會造成怎樣的微生物風險。將活性包裝和智慧包裝兩者結合起來，能為未來造就許多機會。」

整合包裝開始有包裝互聯網（IoP）這樣一個稱號。「這蘊含極好的機會，首先就是它可以完全整合價值鏈。當我們有了這個技術，不僅可以記錄地點和農作物收穫的細節信息，還能了解單一容器內的食物營養細節，而且這一切都可追蹤和追溯。我相信IoP的巨大潛力，因為它可以把這些數據連接起來，為整個價值鏈創建一個可持續的包裝系統。」

雖然大部分技術現已存在，但Sand表示：「我們仍要採用更多可持續物料和技術，其中，消費者的行為便要著墨更多。」她進一步指出最大的阻礙：「第一是是廢物收集。這聽起來可能很奇怪，但事實確是如此。儘管有先進的技術和物料科學、良好的回收設施和融合在包裝裏的RFID技術，但若我們沒有把廢物收集起來，這些作用都等同於零。如果不能收集可回收物料，那麼價值鏈就會斷裂。」

回收設計是關鍵

「我們需要讓消費者為自己的購物行為負責，不僅是他們所購買的產品，還有產品的包裝，這個責任仍未很有效地向消費者傳達。我們需要理解的一個大趨勢是『回收就緒』，即包裝設計能夠非常明確地讓消費者理解包裝應如何分拆以準備回收。品牌終於開始在做這點，但最終責任依然在消費者身上，這是需要實際行動的基本環節。」Sand繼續說道：「收集廢物不是什麼有吸引力的事，但是卻非常重要，我們需要一些創意去解決這些問題。」

Sand 對設計師有一個建議。「包裝設計師應該從一開始設計就考慮到回收問題，這一點至關重要。想要成功做到這點，便需要向消費者清楚表明如要他們回收，需要採取怎樣的行動。除此之外，還要考慮到不同類型的消費者和經濟類別，以及進行消費者測試，看看他們怎樣才會以最直接的反應去正確回收。」她指出保健和美容產品就是很好的例子，這些產品過往曾使用繁複又高端的包裝，現在更則容易拆解了。然而，其他產品想要趕上，仍有很長一段路要走。

Sand深知包裝設計師作為生產商和消費者之間的連接角色，因此向設計師提出挑戰：「我們需要設計出能鼓勵消費者回收的產品。這是一項有感染力的挑戰，只有我們可更好地與人們希望保護環境的願望聯繫起來，才能成功。我認為這個設計挑戰在這個時代是非常值得做的。」

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Non Material

Sampling the Future of Fashion

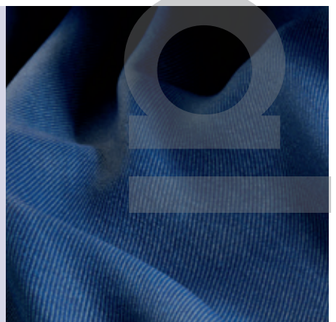
為時尚界的未來採樣

Text by Steve Jarvis Visuals courtesy of Jørgen Sevild

Jørgen Sevild's session at HKDI Inspire (see Page 13) gave a peek into the frontier of digital materials technology, and the possibilities for it to reshape the fashion industry. Such a profound change is worthy of a deeper dive, and here we join Sevild to discuss the future of fashion.

Jørgen Sevild 在 HKDI Inspire（見第 13 頁）讓觀眾一瞥最尖端的數碼物料技術，以及探索這技術重塑時尚界的可能性。如此深遠的改變值得我們深入探討，接下來，我們將與 Sevild 一起討論時尚界的未來。

Digital fabrics rendered over 3D backgrounds add mood and showcase the potential of what a garment could look like
3D 渲染的數碼布料營造風格並展示了服裝外觀的可能性



"The 3D rendering technologies can make it seem so real that we can't tell if it is a rendering or a real photograph. You can even render designs onto real human beings using augmented reality technology and a photograph, and these are ideal for marketing and e-commerce purposes. The technology can even generate realistic garments dressed on people that are doing activities, such as playing tennis, and it is now possible to create marketing campaigns based solely on 3D models."

Sevild notes that giving manufacturers the ability to create and distribute digital samples of their physical material will ease pressure throughout the supply chain, speed up the acquisition of physical materials and other production elements, and help synchronise the production cycle with expected demand. "The savings from reducing fabric sample shipments between mills and product designers alone will be enormous, and massive implications for resource savings, cost savings, and impact on the environment. This is a really big change!" He also sees a broader shake-up of the fashion industry value chain on the horizon.

"For instance, pre-buying garments, where you can set a target for orders that need to be reached before production, will become mainstream. If it doesn't reach the target, backers can be refunded. Contrastingly, if the demand is very high the production side can adjust for greater demand accordingly. This completely changes the dynamics of the fashion industry, which I consider quite broken, especially in areas such as forecasting—predicting trends and human behaviour—which is a really hard thing to do. So now, we don't have to rely just on predicting the future."

The technology may be new, but when Jørgen Sevild starts talking about high-quality digital fabric samples, he speaks with the authority of being a trailblazer in the field. An industrial systems engineer by training, a marketing entrepreneur in the garment industry by profession, and a technology buff at heart, he wanted to bring these elements together to make his mark by helping fashion adapt to the "phygital" (physical + digital) space. A space between the material and non-material world.

Driven by a simple question, "How do we take digital technology and improve the way things are being done in the real world?" Sevild's foray into digital fabrics started with the founding of INQOVA. After five years of experimenting with AR/VR, scanning, and design tools to accurately digitise fabrics, he is convinced we are on the cusp of systemic change for the fashion industry.

"In the future, fashion designers will be able to design an entire 3D collection by using highly realistic digital materials. A full set of digital versions of everything they plan to produce could be sent directly to the garment manufacturer. The new sketchbook will be digital, and we are now seeing this trend take shape with various online 3D garment design services."

Having good material is a foundation for good design

While excited about 3D garment design, Sevild notes, "We need really good digital materials, such as realistic digital textile samples, to make good digital design. Without good components the overall end product will suffer. You can't make good products with poor materials, and this applies as much to the digital world as it does to the physical world." The technology is starting to catch up, as he notes, "We are now producing high quality digital textures that are good enough to fool the human eye into thinking it is real."

New Possibilities with Digital Twins

Recently, Sevild took up a new position at Bandicoot, with its market-leading technology in material digitalization, he believes the company's technology is a game changer, as it is not only unmatched in quality, but it is also accessible, simple, fast, flexible, and compatible with all 3D CADS. This DIY material digitisation technology allows the creation of what he calls a "Digital Twin", an information-rich "data container" that captures all aspects of a fabric, and dramatically increases the creative potential for designers. He points to three areas that will be profoundly affected: 3D simulation, transparency, and traceability.

"Information-rich digital twins can open a new realm of value-adding elements such as personalisation and history, and it gives a wider scope to build relationships with an item, building care and concern for a product that is far greater than the physical version. We need to be able to bring data and the possibilities for tracing its life through the product lifecycle, even to the point identifying material sources and production processes, and all aspects of the creation of the garment and its effects on the environment. Until recently, there was no way to capture that data, but this has been radically changed with the emergence of digital twins and blockchain technology."

Sevild envisions the day when brands will be putting clothes in an e-commerce store that have yet to be created. "Once sufficient orders have been placed, then they will go and produce it. This will dramatically reduce the wastage that floats around the value chain and the industry. it will also be reflected in greater product customisation and the diversity of options available to consumers." He continues, "Fast fashion sells

products that a million other people could have, whereas the smaller retailers are nimble and trade on exclusivity. The big fashion brands could struggle to adapt to this changing ground, and it could well be a bonanza for small independent labels, designers, and retailers."

When pressed on how designers can best prepare for this changing fashion landscape, Sevild is adamant about understanding the basics. "Learning 3D design tools is a fundamental skill that will be essential for nearly any design endeavour. Designers need to find what is being used, and learn the software and tools that are relevant to their chosen field. It is the next big frontier." That is advice you can take it to the bank, as fashion designers in the future will have to be as skilled in non-material aspects of creative expression as they have always been with their physical material.

高質的數碼布料樣品是一項新技術，Jørgen Sevild是這個領域的開拓者，在他開始談論這個議題時，很自然地便成為這個領域的權威。本身是工業系統工程師出身，職業是製衣業市場推廣企業家，內裡是個名副其實的科技愛好者，他想將這些要素結合在一起，通過協助時尚界適應「實體數碼化」(實體 + 數碼)來在業界佔一席位。

Sevild 的動力是想解決一個簡單的問題：「我們如何利用數碼科技去改善現實世界中的工作方式？」他涉獵數碼布料，始於創立 INQOVA 。在運用擴增實境、虛擬實境、掃描和設計工具進行了五年的實驗後，他得以準確地把布料數碼化，並深信我們正處於時尚界系統性變革的風口浪尖之上。

「將來，時裝設計師可以使用高度逼真的數碼物料來設計整個 3D 系列，並將計劃生產的所有產品以數碼化形式呈現，再直接發送給服裝製造商。新的草圖將會數碼化，現時網上也出現不少 3D 服裝設計服務，可見這個趨勢正逐步形成。」

良好的物料是優質設計的基礎

Sevild對3D服裝設計十分期待，同時亦指出：「我們需要質素非常好的數碼物料，比如像真度高的數碼布料樣本，以做出優質的數碼設計。如果沒有好的組件，最終的成品一定會受到影響。你不能用劣質的材料製造出好的產品，這個道理，在數碼和現實世界都同樣適用。」正如Sevild所說，科技正逐漸趕上：「我們正在生產高品質的數碼材質，它的質素足以使人看到後以為是真品。」

「3D繪圖技術幾可亂真，令人很難分辨是3D繪圖還是真實照片。你甚至可以使用擴增實境技術和真實照片，將設計繪圖放在真人身上。這些技術對於市場推廣和電子商務，是非常有用的。這項科技甚至可以產生真實的服裝，放在正在活動，例如是在打網球的人身上。現時，市場推廣活動已可以完全使用3D模型進行。」

Sevild指出，賦予生產商創建和分配實物材料的數碼樣本的能力，可以緩解整個供應鏈的壓力，加快購買實物材料和其他生產所需，並讓生產周期配合預期需求。「單單是透過減少工廠和產品設計師之間的布料樣本運輸，就能夠節省大量資金，對節約資源、減低成本和對環境帶來的影響，也有巨大意義。這是一個非常重要的變化！」他還預視到，這會對時尚產業的價值鏈帶來顛覆性的影響的。

Having fully digital material allows designers to explore all avenues of creativity without ever wasting any physical materials.
完全數碼化的物料可以讓設計全方位發揮創意，而不會浪費任何實際物料。

「比如說，預購服裝將會成為主流，這可以在生產前設下訂單目標。假如沒有達標的話，便可以退款給預購者。相反，如果需求非常高，生產方便可以作出相應的調整，以滿足需求。這徹底改變了時尚界的生態，而這是難以預測的 — 畢竟預測趨勢和人類行為的確是一件非常困難的事情。現在，我們不需要單單依靠預測了。」

數碼孿生的可能性

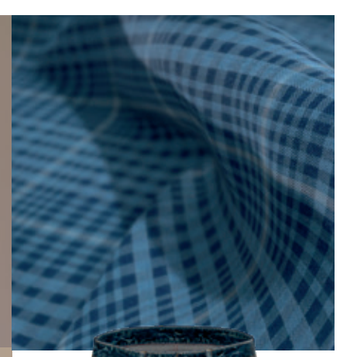
最近，Sevild在先進的物料數碼化公司Bandicoot擔任了新職位。他相信公司的技術改變了業界的遊戲規則，因為這種技術不僅能以容易得到、快速和靈活的方式提供高的質素，並且與所有3D CAD 軟體兼容。這種 DIY 物料數碼化技術可以實現所謂「數碼孿生」，即以信息豐富的「數據容器」取得布料各方面的特徵，大大增加設計師的創造力。他亦指出三個影響深遠的範疇，分別是3D模擬、透明度和可追溯性。

「信息豐富的數碼孿生可以為增值元素開闢新境界，例如客製化和歷史軌跡等，並在與物品建立關係時有更廣泛的應用，對產品的看法亦不限制於物理層面上。我們要掌握數據，透過產品的周期追蹤其產品壽命，甚至是識別物料來源、生產過程、與服裝生產有關的各個層面和其對環境的影響等。過往我們沒有辦法取得這些數據，但隨著數碼孿生和區塊鏈技術的出現，這種情況發生了根本性的變化。」

Sevild 設想有一天品牌會將衣服放在尚未創建的電子商店中。「一旦有足夠的訂單，他們就可以投入生產，這將大幅減少價值鏈和行業中的浪費，並可以看到更高程度的產品客製化和消費者多樣性的選擇上。」他繼續說道：「快時尚銷售百萬人都可擁有的產品，而小型的零售商則以靈活性及獨特的商品取勝。各大時尚品牌可能難以適應這種變化，因此小型獨立品牌、設計師和零售商或許能從中得益。」

當被問及設計師該如何因應時尚界不斷變化的環境下做好準備，Sevild堅持要打好基礎。「學習使用3D設計工具是基本的技能，對任何設計工作都至關重要。設計師需要知道正在使用的是什麼東西，並學習與他們領域相關的軟件和工具。這將是下一個尖端的領域。」這絕對是重要的忠告，要成為成功的時裝設計師，在非物質方面的創作，亦要像他們對實際的物料般熟悉。

Digital materials created by Hong Kong-based company Virtual Touch
由香港公司 Virtual Touch 創作的數碼物料



These washed-out jeans only exist in the virtual world
這水洗牛仔褲只存在於虛擬世界中

Jørgen Sevild
Jørgen Sevild has spent the past 10 years working with simulation and information technology across the global fashion supply chain. Together with Bandicoot Imaging Sciences, he is now making it possible for anyone with a camera to digitise fabrics for use in 3D design software, and for designers to sample materials digitally directly from the factory.

Jørgen Sevild
Jørgen Sevild 於過去 10 年一直致力於全球時裝供應鏈的模擬和信息技術。於 Bandicoot Imaging Sciences 公司裡，他使任何擁有相機的人都可以將布料數碼化，以應用於 3D 設計軟件上，並讓設計師可以直接在工廠對物料進行數碼化採樣。

A Feel for the Future of Bioengineering

感受生物工程的未來

Text by Steve Jarvis Photographs courtesy of PSYONIC

Smashing martial arts boards with your prosthetic hand is not in the user manual, but, if it is called the Ability Hand, and if it is capable of doing that, then why not? Impressively, the same hand is also able to pick up individual raspberries with ease. Once a staple of science fiction, the future of bionic prosthetics is already here.

說明書上並沒有講解怎樣用義肢砸碎武術木板，但是如果這隻能力之手（Ability Hand）能夠做到這一點，那又有何不可？更厲害的是，這隻手還能輕鬆地拿起小如一粒紅莓。仿生義肢曾經是科幻小說中的主要內容，此刻，未來已然到來。

The maker of Ability Hand, PSYONIC, a start-up out of the University of Illinois Urbana-Champaign, has spent the last eight years refining their bionic hand, and the company now boasts one of the most affordable, robust, and useful prosthetic devices ever created. We speak to the founder of PSYONIC, Dr. Aadeel Akhtar, about his journey and what lies ahead at the frontier of bioengineering.

Clicking the hand into place on a nearby arm prosthetic socket, Akhtar, enthusiastically launches into the details of the Ability Hand. "There is a spring steel link connecting the joints through a 3D-printed bone made of rubber and nylon, making it flexible in the lateral direction, allowing movement side to side, but still rigid when something needs to be gripped. The palms are made of carbon fibre, which gives structure to the motors and other components, while allowing the hand to be very strong and durable. The hand itself is detachable, comes in different sizes, and weighs less than an average human hand. You can even charge your phone on its USB-C rechargeable battery."

As cool as it looks on the outside, it is on the inside where the magic happens. Akhtar continues, "Inside each of the fingers are six touch sensors, one on the fingertip, one on the finger pad, two on the lateral side and two on the medial side for a total of six sensors per digit. Then there is a vibration motor positioned appropriately on the residual limb so users can receive haptic feedback from the touch sensors."

The Ability Hand's sensory system is compatible with most major control systems, opening up the technology to a wide range of users. "A common way to control a hand is using two muscle sensors located on the forearm, where even without a hand you still have these muscles, but there are also three or four other ways to get motor control and sensory perception via different muscles and skin regions such as shoulders, etc.," said Akhtar.

While Akhtar enthuses over the technology, he is quick to point out that having an artificial hand that can replicate much of what a real hand can do is an incredibly empowering experience for people with limb differences. Moreover, having something that looks futuristic and cool is a real image change for prosthetics, inspiring interest and awe rather than pity for an appendage that has been lost.

Highly responsive digits enable diverse grip patterns
反應靈敏的手指可實現多種抓握模式

A technical and personal journey

Prioritising the human element is an important part of the Ability Hand story. Actually, it is a very personal journey for Akhtar, one that has its roots in a childhood visit to Pakistan where he saw an amputee, a girl his age, hobbling along with only a stick for help. The comparison with his life was confronting, and he vowed to someday help people like her. It was no faint promise. With degrees in Biology and Computer Science, a Masters in Electrical and Computer Engineering, and a PhD in Neuroscience, he has been constantly moving toward this goal.

"When I was in graduate school we visited Ecuador and saw a patient who had lost his left hand. After fitting the prototype, the recipient Juan said it was as if a part of him had returned after 35 years. This was the real start of PSYONIC, and was a very motivating factor because I could not accept that this life-changing technology could be left on the shelf as an unused project, something we see so often with academic projects." Akhtar wanted every amputee to feel the way that Juan did when he tried on the hand for the first time.

Akhtar first started making bionic hands in 2014, and in the subsequent eight years they have gone through nine prototypes. "The first four hands were 3D-printed in plastic, but it was after the fourth prototype we started this process called "customer discovery" and talked to as many end-users as possible. This amounted to hundreds of patients and clinicians, and the number one thing they complained about, even with $50,000 injection moulded and custom machined steel bionic hands, was that they were brittle and fragile. It wasn't as if they were doing anything crazy. Something as mundane as hitting their hand on a table would break it because they were rigid and would just snap at the joints."

This crystallised the parameters for Ability Hand. Akhtar explains, "The goal became being able to use low-cost 3D printing, but make this hand more robust than anything out there. This led us to the soft robotics literature, where researchers were experimenting with low-cost silicone with properties similar to our own ligaments, skin and tendons. So we started 3D-printing a rubber bone reinforced with nylon and encased it in silicone. This made it stiff in the areas where we needed it to be stiff, but also flexible where needed. The result is a hand both flexible and tough."

The Ability Hand is a marvel of bioengineering, but it can only be a pale imitation of what nature and evolution have provided us. Akhtar elaborates, "The Ability Hand only has six motors and therefore six degrees of movement, but it is much less than an actual human hand that has closer to 23 degrees of movement. Given these limitations, to make the most of the hardware we needed to think what information was required to give the body in order to give the mind a complete representation of what is happening with the hand."

Tough enough for load bearing and delicate enough to grip instruments, the Ablity Hand gives users a new lease on life.
Ablity Hand 足夠堅強去承重，同時也足夠細膩去抓握物件，讓用家重獲新生。

Sense catching is a fine art

Akhtar gives insight into this complex sensory arrangement, "A short haptic buzz lets the user know when they have come into contact with an object, and also how hard they have grabbed the object via the strength of the vibration signal. This is combined with a contact reflex, where a sensor will detect pressure over a minimum threshold and then the hand physically slows down or stops automatically. It is an artificial version of a reflex so the user isn't directly controlling this, but it slows the process down enough for the user to define control over how they want to control or squeeze an object."

"The most sophisticated control comes with having the haptic feedback work in conjunction with the contact reflex function, allowing the delicate control necessary to touch fragile objects," said Akhtar. However, for him, the biggest challenge facing prosthetics' development is actually proprioception, which is the ability for us to know where our joints are located in space without us having to look at them.

"Your mind has a representation of where your hands or feet are, and this movement is synced with your mind, and this allows what is called embodiment. It is the thing that makes us feel like an object isn't just an object, but actually part of our own body. So, if you stimulate the proprioception sensory nerves when you move your finger, you can stimulate it appropriately to make it feel like your phantom hand or finger was actually moving. This is the point when you have created a bond between the mind and the machine, and it actually feels like an extension of your body."

Akhtar thinks bionics will undergo ever-more biological integration, "We have been partnering with university research labs that are not only working in peripheral nerve sensing, but also in the brain, directly stimulating these neural networks. The goal is to be able to move the hand directly from the brain, and we are now exploring integrating sensors into the bones, residual muscles and nerves as the next level of integration," said Akhtar. Something that will be critical for their next project, the Ability Leg, "It is a leg that is directly integrated into the bone, but also able to directly read the nerve signals so you can bend your ankle with the fidelity that a person had prior to their amputation. That is the future we are looking at."

The robotics and AI industry are also taking a close interest in Ability Hand. Akhtar elaborates, "These companies are trying to build robots that are doing human tasks, and we built a hand that was optimised for humans to do human tasks, so the crossover is clear when you are trying to design robots to do human tasks. It just makes sense. Facebook, for example, has bought some of our hands and has installed them on robotic arms being developed for applications like remote medicine. Or more everyday things, like grabbing pill bottles and opening caps or bottles of water. This is an entirely additional application, one we considered in the past, but we didn't realise how synergistic the crossover is between robots and prosthetic limbs."

Bioengineers need good designers

Given his work's reliance on integration and seamless communication, we asked Akhtar his opinion on what role designers can play in bioengineering. "At the end of the day user experience is most important. How it feels and functions are critical to making a good product, but traditionally there has been less of a focus on aesthetic factors, the thing that makes you feel cool to be wearing a bionic limb. This is where designers can contribute by helping engineers to come up with something that is not only functional but also aesthetically appealing. More than just a tool, it should be an extension of their body."

A lot of the designers Akhtar has worked with in the past have been able to come up with great renders of really interesting ideas. Yet they are not applicable to real-world applications because of engineering limitations. He continues, "That is why it is so critical to have a dialogue at the earliest stages, because engineers don't have sophisticated design skills that make the technology user-friendly, but they do understand what is required to make it work. Having a dialogue helps synchronise both sides of the equation. Merging the engineering and the design side is so important when you are making something that is real."

The Ability Hand can give a new lease on life
Ability Hand 可以賦予用家新生命

Ability Hand的製造商PSYONIC是來自伊利諾伊大學厄巴納-香檳分校的一家初創公司，過去八年一直在完善他們的仿生手。現時他們的義肢設備是市場上最實惠、堅固和實用的產品之一。我們專訪了PSYONIC的創辦人Aadeel Akhtar博士，談談他的製作歷程以及生物工程的未來發展。

Akhtar將仿生手裝入身旁的手臂義肢插座上，便開始熱切地介紹Ability Hand：「這裏有一個彈簧鋼條，通過由橡膠和尼龍製成的3D打印骨骼連接各關節，使其具有橫向靈活性，可以向側移動，但在需要抓握東西時，它仍然可以非常穩定。手掌是由碳纖維製成，既為起動機和其他組件提供結構性的支持，同時使手掌非常堅固耐用。仿生手本身是可拆卸的，有不同的尺寸，重量比普通人的手要輕。你甚至可以用它的USB-C可充電電池為手機充電。」

它的外表看起來很酷，內部亦暗藏玄機。Akhtar繼續說道：「每隻手指裏面有六個觸覺感應器，一個在指尖，一個在指墊，兩個在外側，兩個在內側。在殘肢的適當位置裝上感應器，用家便可以透過感應器的振動起動機得到得觸覺。」

Ability Hand的感應系統與大多數控制系統兼容，因此可為廣泛用家提供這項技術。Akhtar表示：「控制手部的常見方法是使用位於前臂上的兩個肌肉感應器。即使沒有手，你仍然有這些肌肉。但也有另外三四種方法，通過不同的肌肉和肩膀等皮膚區域，讓用家得到活動控制和感官知覺。」

Akhtar對這項技術充滿熱情，他指出擁有可以模仿真手大部分功能的人造手，能給予有不同肢體障礙的人士帶來超乎想像的自主體驗。此外，這看起來充滿未來感和型格的義肢，為義肢帶來形象上的改變，它能夠激起人們的興趣，同時令人驚嘆不已，而不是對失去肢體的人士感到遺憾。

技術和個人之旅

優先考慮人類元素，是Ability Hand的一個重要部分。事實上，這對Akhtar來說是一個非常個人的歷程。他在童年時曾造訪巴基斯坦，在那裏遇見一個與他同齡的截肢女孩，只靠一根棍子的幫助蹣跚而行。 他感到很震驚，並發誓有一天要幫助像她一樣的人。這並不是一個輕淡的承諾。其後他獲得生物學和計算機科學學位，電子和計算機工程碩士學位，以及神經科學博士學位，一直在朝著這個目標前進。

「在研究生時期，我們到訪厄瓜多爾，看一個失去左手的病人，也是產品測試者Juan。為Juan裝上義肢後，他說自己的一部分彷彿在35年後回來了。這標誌著PSYONIC的真正開始，也是一個令我非常鼓舞性的因素。我不能接受這種改變生活的技術變成一個被束之高閣的閑置項目，這種情況在學術專題項目中可謂非常普遍。」Akhtar希望每個截肢者都能像Juan一樣，獲得第一次試用義肢時那種感覺。

Akhtar在2014年首次開始製作仿生手，隨後八年先後開發了九個樣品。「前四隻仿生手是用塑膠3D打印的，但到第四個樣品之後，我們才開始了這個稱為『客戶發現』的過程，盡可能多與用家交流。我們和數百名病人以及臨床醫生討論，他們抱怨的第一件事就是，就算是價值五萬美元的注模客製鋼鐵仿生手，也是非常脆弱易壞的。用家並不是做了什麼瘋狂的操作，他們只是把手碰到桌子這樣平常的東西，仿生手便會受破損，因為它們都是硬的，往往在關節處斷裂。」

這促使了Ability Hand的各項參數變得更具體。Akhtar解釋說：「我們的目標是能夠使用低成本的3D打印技術，製造出比現有產品都要堅固的仿生手。順著這一思路，我們閱讀了有關軟體機器人的文獻，其中研究人員試驗低成本的矽膠，質感類似我們的韌帶、皮膚和肌腱。就是這樣，我們便開始以3D打印了一個橡膠骨頭，用尼龍加固並以矽膠包裹。這讓它在該堅硬的地方堅硬，該靈活的地方靈活，最後就得出一隻既靈活又堅韌的手。」

Ability Hand是生物工程的一個奇跡，但Akhtar表示它只是對自然和生物進化的粗略模仿。他解釋道：「Ability Hand只有六個感應器，因此只有六種移動方式，相比起實際人類手部近二十三個移動方式要少得多。因為這些限制，要最大程度運用到硬件，我們需要思考要給身體提供哪些信息，才能讓大腦充分反映手上正在進行的動作。」

感官捕捉是一門藝術

Akhtar深入分析這複雜的感官活動：「短促的觸覺提示可以讓用家知道他們接觸到一個物體，並通過振動信號的強度知道抓住物體力度的大小。這與接觸反射相結合，感應器檢測到超過最低閾值的壓力，接著手部動作就會自動慢下來或停止。這是一個人工的反射動作，所以用家並不是直接控制，但它令這個過程漸漸慢下來，然後慢到足以讓用家決定如何控制或擠壓一件物體。」

他表示：「最複雜的操作是讓觸覺反饋與接觸反射功能同時運作，容許觸摸脆弱物體時所需的精細控制。」不過對他而言，本體感覺才是義肢發展面臨的最大挑戰，也就是我們無需查看，就能知道關節所處的空間位置的能力。

「你的大腦中存在著四肢在哪的概念，它們的動作和大腦同步，這就實現了所謂的具身認知。它讓我們感覺到一個物體不僅僅是一個物體，而實際上是我們自己身體的一部分。因此，如果你在移動手指時刺激本體感覺神經，你可以通過適當的方式刺激，使它就如虛幻的手或手指在移動一般。這就是你在思想和機器之間建立聯繫的重點，實際上你會感覺它是你肢體的延伸。」

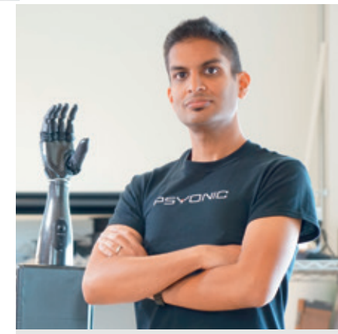
Akhtar認為仿生學將會經歷生物整合不斷推進的過程，他說：「我們一直在與大學研究實驗室合作，這些實驗室通過外圍神經感應或在大腦中直接刺激這些神經網絡。我們的目標是能夠直接通過大腦指揮手部動作，現在正在探索將感應器結合到骨骼、殘餘肌肉和神經中，作為下一個整合的階段。」Akhtar說這對他們的下一個項目 — 能力之腿（Ability Leg）是至關重要的一環。「這條腿可以直接和骨頭結合，也可以直接讀取神經信號。這樣，用家就可以有一種猶如截肢前彎曲腳踝那樣真實的感覺。這就是我們想要的未來。」

機器人和人工智能業界也對Ability Hand產生了濃厚的興趣。Akhtar 解釋道：「這些公司正在嘗試製造執行人工任務的機器人，而我們製造了一隻專為人類執行任務而優化的手，因此他們想要合作的想法自然很合理。例如Facebook購買了我們的一些仿生手，並安裝在應用於遠程醫療等方面的機械手臂，或者是更多日常的事項，例如拿藥瓶、打開瓶裝水的瓶蓋等。這是一個完全附加的應用，我們過去曾考慮過，但我們沒有意識到機器人和義肢之間的合作可以如此相輔相成。」

生物工程師需要優秀的設計師

由於Akhtar的工作依賴整合和無縫溝通，我們詢問了他對設計師在生物工程中可以扮演什麼角色的看法。「歸根究柢，用家體驗是最重要的。它的感覺和功能對於製作一款好的產品至關重要，但傳統上人們很少關注美學元素，即佩戴仿生義肢會讓你感覺很酷那樣。這就是設計師可以通過提出實用而美觀的東西，來幫助工程師。它應該是他們身體的延伸，而不僅僅是一個工具。」

許多Akhtar過往合作過的設計師都能夠提出非常有趣的意念。然而，基於工程上的限制，有些構想並不適用於實際應用上。他繼續說道：「這就是為什麼在最早階段進行對話是如此重要，因為工程師並沒有具備精緻的設計技巧去到技術能方便用家使用，但他們確實知道需要甚麼可行的條件。對話有助雙方同步。當你製作真實的東西時，將工程和設計結合便變得非常重要。」



Dr. Aadeel Akhtar
Dr. Aadeel Akhtar is the CEO and Founder of PSYONIC, a company developing advanced bionic limbs that are accessible to all people with limb differences. Dr. Akhtar received his PhD in Neuroscience and MS in Electrical & Computer Engineering from the University of Illinois at Urbana-Champaign in 2016. He received an MS in Computer Science in 2008 and BS in Biology in 2007 at Loyola University Chicago.

Dr. Aadeel Akhtar
Aadeel Akhtar 博士是 PSYONIC 的行政總裁和創辦人。該公司開發先進的仿生肢體，讓有不同肢體障礙的人士都可以使用。Akhtar 博士於 2016 年在伊利諾伊大學厄巴納 - 香檳分校獲得神經科學博士學位，於 2008 年在芝加哥洛約拉大學獲得電子和計算機工程碩士學位，並於 2007 年獲得生物學學士學位。

Beyond Design
超越設計

Martine Bedin recollects her Memphis days, where furniture existed beyond functions, and designs transcended borders.

Martine Bedin 回憶在孟菲斯設計集團的歲月。在那裏，家具超越功能，設計跨越界限。

In February 2022, HKDI, in collaboration with Novalis Art Design and Italian Culture Institute in Hong Kong, invited Martine Bedin to give a Master Lecture themed Memphis Memories. It was also served as a brief for project "Memphis: the Post-Contemporary Object" in which students in the Furniture and Lifestyle Product Design and Interior Design will design a series of furniture that declines the aesthetic identity of Memphis in a way that is consistent with the brand and, at the same time, in line with the new aesthetic sensibilities native to digital networks. The prototypes will be displayed at Emerging Design Talents 2022 of HKDI and IVE (Lee Wai Lee), International Design Furniture Fair "25 Years of Design" as well as K11 Art Mall from August.

1

1. Martine Bedin co-founded the Memphis Group back in 1980s
於 1980 年代共同創辦孟菲斯設計集團的 Martine Bedin

2. A living room full of the Memphis Group signature furniture design
滿佈孟菲斯設計集團經典家具的起居室

3. A group portrait of founding designers of the Memphis Group
孟菲斯設計集團一眾創始設計師合照

2

In the welcome remarks by Michael Chan, Head of Academic Development at HKDI, he said, "Why is the Memphis design so attractive to me? Because it gives me more questions than answer. When you see a Memphis design, it is not only about how you use your brain to process its function, but you have to use your heart to feel it. It is just like a piece of good music or good food, or even a love story."

When asked to use two words to describe renowned Italian architect and designer Ettore Sottsass, Martine Bedin, industrial designer, artist, architect and teacher, replies slowly but firmly, "I've no words. Two words for him is not fair."

When Bedin met Sottsass in Milan, she was just a 23-year-old student. Soon after that, together with several other members, they co-founded one of the most influential design groups in history, the Memphis Group.

Bedin admits that "heart" played a crucial role at Memphis. "We mixed up the brain and the heart, sometimes too much. It got us into troubles at times, but that's exactly how we worked."

To understand the Memphis style, one needs to first understand the context when it emerged. Decades before the birth of Memphis, the end of WWI left people with no affection for bright colours or intricate details in design. Europe was dominated by Modernism. Designers like Le Corbusier expressed "maximum modernity through minimum space". However, things changed drastically after WWII. People were still left with uncertainties, but they learned to cherish peace and life. Rebuilding, reconstruction, rediscovering the meanings of life and reinventing became the norms.

In 1969, Olivetti introduced the Sottsass designed Valentine typewriter to consumers. The red portable typewriter was a statement justifying that technology could have a friendly image. The same idea also applied to automobile. "Shape follows function, but they also follow the dream of the function." Bedin says, "If the car has to be fast, the shape has to be like birds and fish."

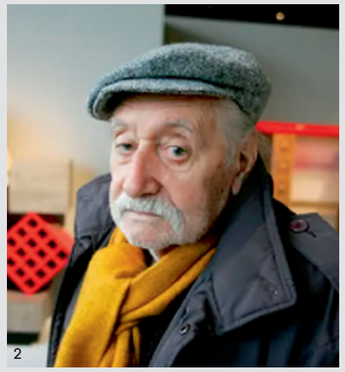
The market gradually dominated consumers. Every choice of purchase was made under the conditions given by the market. Trying to address and combat such issue, Italian design students from the 70s founded Architettura Radicale. They discussed the harm of mass production and the loss of meanings for objects, which in turn unfolded the Memphis Group concept.

Seeing the bold colours and shapes from Memphis, some say Memphis design is the representation of childlike innocence, some argue it is a political declaration against social hierarchy, others claim it is the humour left within the pessimists. As co-founder of the group, Bedin says, "Memphis was an international language. People can connect with it quickly. Memphis was the new international style. Unlike Postmodernism taking references from Classical Architecture, Memphis was inspired by everything that was not in the academia, but in the suburbs, or foreign funny houses."

The famous and influential designers today were just students when they started designing at the Memphis Group. With Sottsass's trust and support, they devoted their true selves and dreams into designing. Bedin recollects her conversation with co-founder Michele De Lucchi about Sottsass:

3


1


2

"We were so young, why did he choose us?"

"He needed our energy, without background, just doing designs."

"We were as new as the things we were designing."

The group prepared the first Memphis exhibition in 1981 under the dark, but its popularity exceeded everyone's wildest dreams after opening. "Even now, I don't understand why people came to see an exhibition that they didn't even know what to expect."

Bedin designed the manifesto for the first Memphis exhibition, but it was her "Super Lamp" that turned her into a superstar overnight. Bedin explains, "I was studying in Paris and I was putting bubble lamps in everything. I had to travel back and forth between Milan and Paris and came up with the funny idea of carrying my lamp as my dog behind me." Just like that, the Super Lamp became the best-seller at Memphis. "I guess it was because that was the cheapest product there." Bedin laughs.

Bedin's playful designs may have come from her attitudes of holding objects dear and regards furniture as friends. She says, "When you stumble upon a piece of furniture in the dark in the middle of the night, you probably aren't happy. When it happens to me, I say sorry to the table."

Being made famous by Memphis at a young age, the group of designers continued to grow, both together and apart. Bedin's Super Lamp also grew in its own way. As for Bedin, she works in and out of the industry, experiments with diverse materials including marble, bamboo, ceramics and glass. She continues to broaden her design language and touch and inspire with her designs.

As she puts it, "We have to keep on looking at the horizon, where new ideas and poetry await to be understood and transmitted, and let's dream."

2022年2月，香港知專設計學院與Novalis Art Design和意大利駐港文化處邀請了Martine Bedin為線上大師班主講，主題為「孟菲斯歲月」。講座同時也是給家具及時尚產品設計和室內設計高級文憑學生的「Memphis: the Post-Contemporary Object」項目的導讀。學生在了解孟菲斯的美學精神後，需要運用當中的元素，設計符合現今數碼網路美學的全新家具系列。家具原型將於八月在香港知專設計學院（HKDI）及香港專業教育學院（李惠利）（IVE（Lee Wai Lee））的2022年度設計展、國際設計家品展之「25 Years of Design」展覽及K11購物藝術館等地展出。

在致歡迎詞時，香港知專設計學院學術發展主管陳詩華對孟菲斯設計集團的欣賞溢於言表。他說：「為何孟菲斯的設計如此吸引我？因為它給我的問題永遠多於答案。當你看見一件孟菲斯作品時，你不僅要用大腦理解它的用途，還需用心去感受它的的設計。孟菲斯的作品就像是一首好音樂、一道美食，甚至是一個愛情故事。」

在線上講座上，當擁有工業設計師、藝術家、建築師及教師等多重身份的Martine Bedin被問及可否用兩個字詞來描述意大利著名建築師及設計師Ettore Sottsass時，她緩緩而堅定地說：「我說不出來。只能用兩個字詞來形容他並不公平。」

當Bedin在米蘭初次見到Sottsass時，她還是一位23歲的學生。不久之後，他們就與其他幾位夥伴一起成立了世界上最具影響力的設計團體之一，孟菲斯設計集團。

Bedin坦言「心」是孟菲斯設計中重要的元素。「在孟菲斯，我們結合腦中所想與心中所願，有時結合得太多，還曾令我們陷入窘境，但那正正是我們做事的方法。」

要理解孟菲斯風格，便要先理解當時的社會境況。在孟菲斯誕生的數十年前，第一次世界大戰完結後，人們無心關注色彩與繁複的設計細節，當時歐洲就被風格簡約的現代主義主導，像以勒·柯比意為首的設計師以最簡單的空間，演繹最強烈的現代感。然而，第二次世界大戰以後發生了巨大的變化。雖然人們對很多事情並無把握，但他們更懂得珍惜得來不易的和平和生命。因此戰後重建、重新發掘生命的意義和重塑事物便成為了新常態。

1969年，Olivetti推出由Sottsass設計的全紅色Valentine便攜打字機，提出了科技亦可以擁有平易近人的外型的理念，因此一推出便風靡社會。汽車也一樣。「外形隨著功能變化，亦隨著功能的夢想而改變。」Bedin解釋：「一輛車如果需要速度快，那麼它就要有猶如鳥或魚的外形。」


3

市場亦逐漸主導消費者，購物的選擇在市場所定的條件下作出。為了應付這個問題，70 年代的意大利設計系學生推動了「意大利激進建築運動」。他們討論大規模生產的害處和物體意義的喪失，這亦成為發展孟菲斯設計集團概念的開端。

看到孟菲斯家具大膽的色彩和高調的形狀，有人說孟菲斯的設計是童心的象徵，是抵制階級制度的政治宣言，也有人說它是悲觀主義者心中留下的幽默。創始人之一Bedin表示：「孟菲斯是一種國際語言，人們很快就能與它建立聯繫。孟菲斯是新的國際風格，與借鑒古典建築的後現代主義不同，孟菲斯的靈感不是來自學術界，也許是來自鄉間，或者是異域的有趣房子。」

這些如今功成名就的設計師在創立孟菲斯時，都還只是初出茅廬的學生。在Sottsass 的信任和支持下，他們將真實的自我和夢想投入在設計中。 Bedin 回憶她與聯合創辦人 Michele De Lucchi 一段關於 Sottsass 的談話：

「我們當時那麼年輕，他為何選擇我們？」

「他需要我們的能量。那種沒有任何背景和牽絆，純粹做設計的能量。」

「我們就像我們設計的物件一樣新鮮。」

集團於1981年籌備首屆孟菲斯展覽時仍是什麼都不會，未來境況未明，然而開幕後取得空前的成功，受歡迎的程度遠超他們想像。「直到今天我也不明白，人們為何對一場他們甚至不知道有甚麼看的展覽趨之若鶩。」Bedin說。

她為第一屆孟菲斯展覽設計了宣言，但令她聲名大噪的，是一盞名為「超級燈」（Super Lamp）的可移動小型地燈。Bedin解釋說：「我在巴黎讀書時已熱衷於小燈泡，什麼設計都要加上。那時我需要在米蘭和巴黎穿梭，於是便產生這個有趣的想法：為何不做一盞可以像狗一樣跟在我身後的燈？」隨後，它便成為了孟菲斯展覽上最賣座的產品。「我想這可能是因為它也是那裏最平價的產品吧。」Bedin笑着說。

Bedin的作品玩味十足，也許是源於她珍視物品和視家具為朋友的態度。她說：「當你晚上在黑暗中不小心撞到一件家具，你一定是不開心的。但是當這件事發生在我身上，我會向桌子道歉。」

這班設計師在年輕時因孟菲斯而成名，無論是一起還是分開，他們都不斷在成長。Bedin的超級燈也發展出自己的一片天。至於Bedin，她在這個行業內外開展了自己的歷練與修行。這些年來，她以大理石、竹、陶土、玻璃等多種元素進行實驗性創作，不斷拓寬其設計語言，受到廣泛好評。

她說：「我們要不斷放眼遠方，新的思想與詩歌總會在那裏，靜待被挖掘和傳揚。讓我們永遠擁抱夢想。」

4

1. Furniture ideas inspired by the Memphis aesthetics and created by the students from the Furniture Design and Interior Design programmes at HKDI
受到孟菲斯設計美學啟發的概念家具，由香港知專設計學院家具設計及室內設計學生構思創意。

2. Renowned Italian designer and leader of the Memphis Group, Ettore Sottsass.
著名意大利設計師，孟菲斯設計集團精神領袖 Ettore Sottsass。

3. Titled "Rice Noodle Roll + Fish Ball + Siu Mai" , a shelving system inspired by different forms of Hong Kong's popular snack.
名為「腸粉 + 魚蛋 + 燒賣」的陳列櫃設計，靈感源自香港地道小食的不同形態。

4. A more futuristic approach in creating chairs and benches
以超前的方法構想椅子及長凳的未來設計

5. Titled "Lam Tsuen Wishing Tree", a display and hanging system inspired by Hong Kong famous wishing destination of Wishing Trees at Lam Tsuen, Tai Po.
名為「林村許願樹」，靈感源自香港大埔著名許願樹景點。


5

VR for Pain Management

虛擬實境應用設計——疼痛管理

1

HKDI has worked with different stakeholders on "VR for Pain Management", a well-being design project which adopts design thinking and innovative approach of digital media to develop a pain management experience for patients. The objective of the project is to provide a pleasant, low risk and easily tolerated option for the patients through VR game solution in order to achieve a medication-free surgery and operation.

香港知專設計學院與不同持份者合作開發「痛症管理虛擬實境技術」，用設計思維和數碼媒體的創新方案，應用於痛症管理上，希望透過這個項目，利用虛擬實境（VR）遊戲，為患者提供一個愉快、低風險且易於接受的選擇，令他們無需透過藥物進行手術。

1. The VR programme revolves around the theme of diving by recreating the context of underwater environment based on its relaxing and meditative nature
VR 遊戲內容圍繞潛水展開，環境被設定為能為人類帶來冥想式能量的海中。

2. Each scenario in the VR programme comes with tasks to complete
整個 VR 體驗會通過故事線和任務來激發用戶的專注與特定情緒

1

While VR has become extremely popular in the gaming industry, equal amounts of attention have been given to VR in the healthcare sector. For example, there has been ongoing research on VR aiding recovery of symptoms ranging from eating disorders to post-traumatic stress disorder (PTSD).

HKDI sees well-being design as the major trend in the industry internationally and locally. Different stakeholders in the industry have started to explore deeper meaning of well-being design in different perspectives. Composed of a local medical centre Genesis Minimally Invasive Surgery Centre and doctors of general surgery including Dr. Tony Chan Tung Fei, Dr. Ng Wai Tat and Dr. Tsui Tsun Miu, the project team invited academic experts from HKDI Design Thinking Team, the Transmedia programme under the Department of Digital Media, Health and Life Sciences Department, Dr. Anthony Kong, and Ms. Jasman Pang Wing-yan to provide advice for this VR experience enhancement service.

In the project, VR becomes a tool to help patients to go through difficult times mentally and physically in surgeries. The immersive technology here does not directly cure patients, but provides a service to reduce discomfort, which is equally important for patients.

The VR program revolves around the theme of diving by recreating the context of underwater environment. The context choice was made based on the relaxing and meditative nature of underwater environments.

The system targets the triggering of different emotions among different age groups of users. It aims for relaxation and tranquility within the elderly; joy and excitement for children; and mystery and suspicion for adults. Within each age or emotion group, there are six scenarios for users to explore and interact with. Each scenario comes with tasks to complete and lasts for about six to seven minutes, as advised by medical experts. The entire game continues to run unless someone interrupts the session.

With both visual and sound elements in place, users gain an immersive experience in the VR diving experience. The interactive game setup allows users to stay focused inside the virtual reality instead of the discomfort brought by the surgery, mentally and physically.

20 students from the Health and Life Sciences Department participated in the VR project by conducting experiments, research and prototyping as their final year projects. In the real-life user experience data they collected, participants claimed they were able to calm down and focus on completing VR game tasks during the surgery.

The interdisciplinary project not only contributes to project-based learning for our students, but also the collaboration approach in VTC and network buildings with industries in the forms of industrial attachment and career by combining the development of a set of VR equipment (hardware) with an immersive game programme (software) with industry practitioners.

VR在遊戲行業中一直都非常流行，其實在醫療衛生領域，VR 亦同樣受到重視，例如VR對幫助舒緩飲食失調症、創傷後遺症(PTSD)等各種症狀的研究一直都在進行。

香港知專設計學院一直視舒適設計為國際和本地業界主要趨勢。業內不同的持份者已開始從多角度探索舒適設計的更深層意義。是次項目團隊由本地的精研微創外科中心以及陳東飛醫生、吳偉達醫生和徐俊苗醫生幾位外科醫生組成，並邀請了香港知專設計學院設計思維團隊、數碼媒體學系超媒體和健康及生命科學的學術專家，還有江培強博士和彭詠欣女士，為提升這次 VR體驗提供寶貴的意見。

在這項目中，VR 幫助患者在手術中度過身心艱難時期。這種沉浸式科技並不是直接治癒患者，而是減輕他們在手術過程中的不適，對患者來說，這是同樣重要的。

VR項目以潛水為主題，模擬置身水中的環境。團隊選擇這個背景的原因是由於水中環境具有放鬆和冥想的性質。

系統希望觸發不同年齡層的使用者不同的情緒：老年人可以感到放鬆和寧靜；小孩子可以感到快樂和興奮；成年人則可以感到神秘和疑惑。在每個年齡層或情感組別中，都有六個場景供使用者探索和互動。根據醫學專家的建議，使用者在每個場景都需要完成任務，時間大概是六至七分鐘。整個遊戲除非被人打斷，否則會一直繼續。

透過視覺和聲音元素，使用者可在VR潛水體驗中身歷其境。這個互動遊戲設置可以讓使用者專注於虛擬實境中，從而忘卻手術在精神和身體上帶來的不適。

20 名來自健康及生命科學系的學生，將透過參與此VR項目的實驗、研究和原型設計作為他們的畢業專題報告。從他們在真實使用者收集到的體驗數據中，反映了使用者能在手術過程中冷靜下來，並且專注於完成 VR的 遊戲任務。

這個跨學科項目透過與業界人士共同研發VR設備硬件和沉浸式遊戲軟件，提升了學生在專題研習方面的技巧，加強了職業訓練局內的協作，亦藉著工作實習和就業，與業界建立聯繫和網絡。

2

The Future of Urbanism
都市化的未來

Patrik Schumacher, Principal of Zaha Hadid Architects, discusses high-rise, topology optimisation and vertical urbanism in his inspiring Master Lecture at HKDI.

Zaha Hadid Architects 董事長帕特里克·舒馬赫於香港知專設計學院的大師班帶來充滿啟發性的演講，與觀眾探討高樓、拓撲優化與垂直都市主義。

Following HKDI's flagship exhibition of the year, *Zaha Hadid Architects: Vertical Urbanism*, the institute presents an online Master Lecture on ZHA (Zaha Hadid Architects).

The event opens with a lecture given by Patrik Schumacher, Principal of ZHA, followed by a roundtable discussion session. Simon Yu, Director of Zaha Hadid Architects in Hong Kong also sits at the panel alongside of seven other panelists hailing from diverse backgrounds, including architects like Florence Chan, Ar. Donald Choi, Dennis Ho and Anderson Lee, also M+ Curator of Design & Architecture, Shirley Surya and Director of School of Architect in The Chinese University of Hong Kong, Professor Hendrik Tieban.

In the lecture, audience gets an invaluable experience of Schumacher himself introducing and explaining the ideas behind the ZHA style of vertical urbanism. He examines how urbanism and high-rise typology has evolved from the Le Corbusier kind of rigid hierarchical structures and shares his view on how urbanism should focus on the more complex issues in society today.

ZHA spots the changes happening in socioeconomic dynamics, patterns of life, ways of working and collaborations and addresses them through design. The stylistic output from ZHA is one of a kind, but the more exciting and inspiring aspect about it is achieving the sense of monumental yet seamless and almost "invisible" at the same time – monumental in terms of its breathtaking appearance, and invisible in terms of how it smoothly adapts to the urban fabric and connects each internal programme together.

In a ZHA building, the top-down bureaucratic layout no longer exists. Instead, one finds interdisciplinary communication and spatial equality achieved by abundant atriums, bridges and programme-filled voids; vertical movements are replaced by internal connectiveness through interlacing paths; porous structures allow for ample visibility from the inside. A clear view of the top floor right from the ground level is even made possible. While the people inside can always find a way to reach the outer urban fabric, the meticulous use of curtain walls also allow those outside of the building to witness the vigourous internal ecosystem.

As an avid advocator for parametricism, Schumacher also offers audience a peek into topology optimisation as both a stylistic and functional solution to building more efficient, cohesive and interconnected urban fabrics.

"Vertical urbanism is also a three-dimensional city." Schumacher says, "It is a very Hong Kong idea." He zooms in on a few of the Asian projects ZHA has worked on over the years, including the unrealised Peak Clubhouse proposal, the more recent exoskeleton Morpheus Hotel in Macau and the Innovation Tower at The Hong Kong Polytechnic University.

The Henderson in Central is ZHA's latest construction in Hong Kong after the Innovation Tower almost a decade ago. We are looking forward to seeing changes in society reflected on this ZHA design and how it can bring more diversity, vibrancy and interconnections to one of the busiest cities in the world.

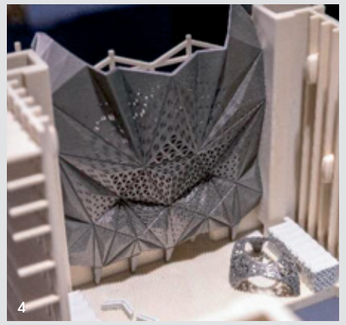
繼香港知專設計學院的年度展覽「Zaha Hadid Architects: 城市境築」後，學院舉辦了 Zaha Hadid Architects（ZHA）的網上大師班講座。

是次活動先由 Zaha Hadid Architects 董事長帕特里克·舒馬赫演講，緊隨其後的網上圓桌論壇環節，由 Zaha Hadid Architects 香港總監俞錦文與另外七位來自不同背景的講者一同參與，包括多位建築師如陳麗珊、蔡宏興、何顯理和李亮聰，以及 M+ 設計及建築策展人王蕾和香港中文大學建築學院主任田恆德教授。

舒馬赫於大師班親身講解 ZHA 垂直都市主義風格背後的理念，令觀眾受益匪淺。他探討了都市主義與高層建築如何從勒·柯比意時期的現代主義逐漸演變成今天的樣貌，並分享了他對都市主義應如何面對更多複雜社會問題的看法。

ZHA 通過設計去應對社會經濟、生活方式、工作與合作方式的變化。其建築風格獨一無二，聞名世界，最激發人心和具啟發性的，是他們所設計的作品既有雄偉的外觀，同時以無縫流線的設計，完美地融入城市環境肌理中，而又能與內部每個細節相連接。

在 ZHA 的建築中，從上而下的官僚格局和封閉的建築模式已不復存在，取而代之的是開放且互連互通的建築模式，通過大量的中庭設計、連廊和細緻規劃的空間感，以內部層疊式的交錯路徑取代垂直發展；孔洞結構讓置身其中的人能看到絕佳的景觀，甚至可以從地面清楚望向最頂層。建築物內的人可隨時接觸到城市外部的環境肌理，當中巧妙使用了建築幕牆，讓建築外的人看到充滿活力的內在生態系統。



舒馬赫是參數化設計的倡導者，他亦帶領觀眾一睹拓撲優化技術如何在風格和實用性上構建更高效、更有凝聚力和更緊密互扣的城市建築群。

「垂直都市主義也是3D城市。」Schumacher 說：「這是一個非常香港的概念。」他向觀眾介紹了 ZHA 的一些亞洲項目，包括未能落實興建的香港山頂俱樂部方案，較近期的則有採用外骨骼結構的澳門新濠天地摩珀斯酒店和香港理工大學賽馬會創新樓。

位於中環的 The Henderson 是 ZHA 繼賽馬會創新樓建成將近十年後在香港的最新力作。我們期待看到這個 ZHA 設計反映的社會變化，以及它如何為香港這個世界上最繁忙的城市之一帶來更多活力、多元和聯繫。

1. Concept model of The Peak Project in Hong Kong
香港山頂俱樂部項目的建築概念模型

2. Thallus showcased at "*Zaha Hadid Architects: Vertical Urbanism*" Exhibition, Installation, 2017
Sculpture developed by ZHCode with ZHD, in collaboration with AiBuild, Odico Formwork Robotics, Armadillo Engineering.
於「城市境築」展覽展示的幾何實驗雕塑 Thallus，裝置，2017 雕塑項目由 ZHCode 及 ZHD 研發，並與 AiBuild、Odico Formwork Robotics 及 Armadillo Engineering 合作。

3. Patrik Schumacher , Courtesy of Zaha Hadid Architects.
帕特里克· 舒馬赫，照片由 Zaha Hadid Architects 提供。

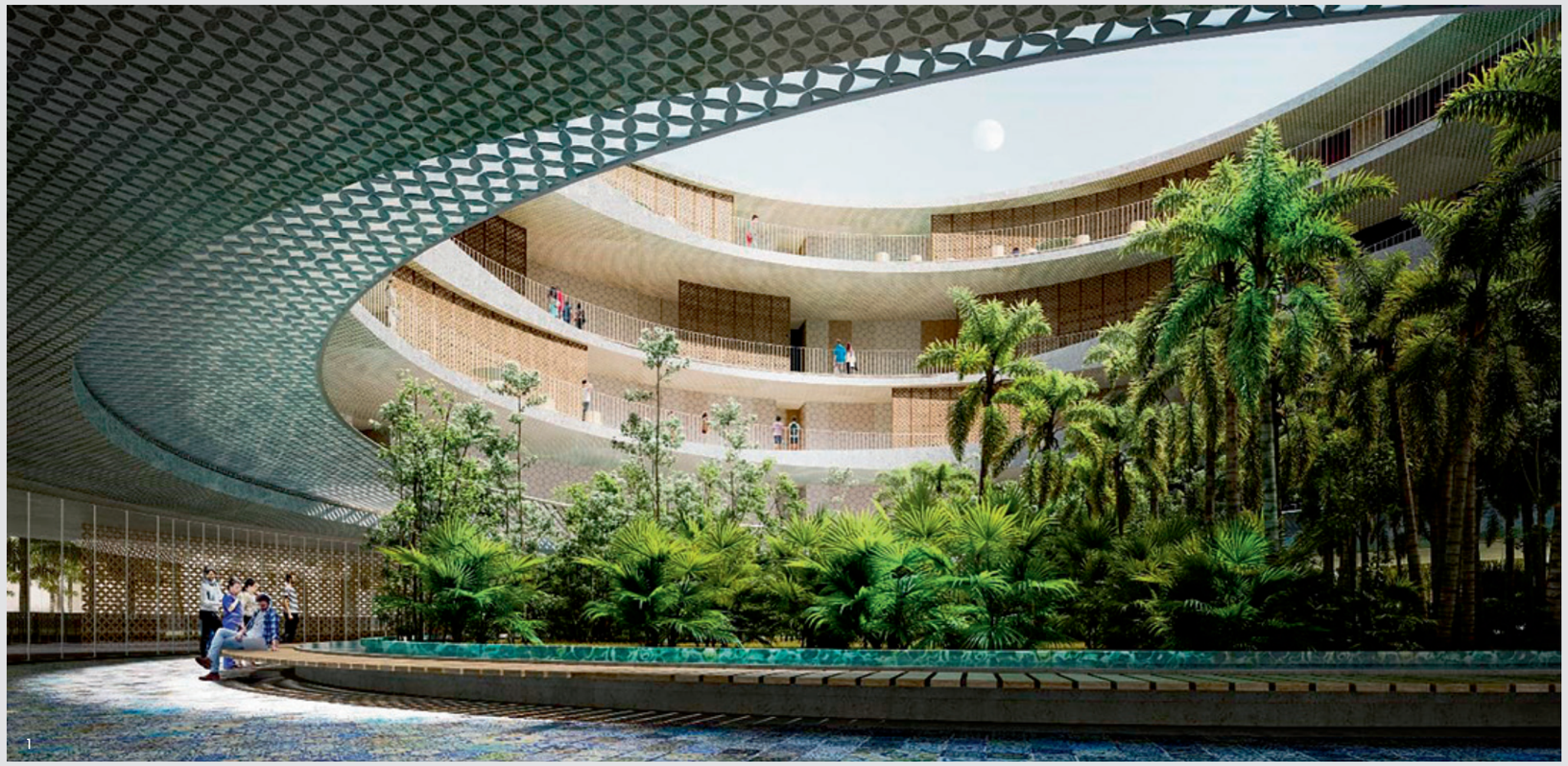
4. Atrium study model for Morpheus Hotel & Resort at City of Dreams Macau, 2013-2018. **澳門新濠天地摩珀斯酒店的中庭建築模型，2013-2018。**

5. One Thousand Museum© Hufton Crow
千號博物館 © Hufton Crow

Mario Cucinella on Green Architecture

Mario Cucinella的綠色建築觀

2



1

Architect Mario Cucinella shares his insights on building Green Architecture through collective intelligence, empathy and social responsibility alongside skillful designs.

綠色建築除了需要爐火純青的設計外，還要通過集體智慧、同理心和社會責任去實踐。建築師 Mario Cucinella 便是在這基礎上分享他對綠色建築的洞見。

1. Cactus inspired Ben Guerir University Campus
受仙人掌啟發的 Ben Guerir 大學校園建築

2. Mario Cucinella, Founder of Mario Cucinella Architects（MCA）.
Mario Cucinella Architects（MCA）創辦人 Mario Cucinella

Mario Cucinella, founder of Italian firm MCA – Mario Cucinella Architects, one of the most influential European architects and an expert on sustainable architecture, gives his inspiring Master Lecture on Sustainability and Beauty coorganised by Consulate General of Italy in Hong Kong and HKDI on 6th Italian Design Day in March.

In his 30 years of career, Cucinella has designed many iconic buildings in Italy and around the world. He bears multiple awards for his innovative solutions in terms of environmental and energy efficiency.

At Cucinella's spacious and sunshine-filled offices in Bologna and Milan, "collective intelligence" is largely encouraged. Cucinella says, "Being an architect does not only mean designing buildings but also having the knowledge in areas such as engineering, design, research and community engagement. We are not a company run by one person, but a combination of intelligence. We would like to call this collective intelligence."

In Cucinella's opinion, creativity and empathy are two crucial words for architects. While the former is easy to comprehend, Cucinella describes the latter as an ability to create relationships with the surroundings, both as an architect and as a person. "Combining creativity and empathy is a way to control. It gives you a very important aspect to the relationship between buildings and the climate and people."

Research is another important tool for Cucinella. "Our work is based on research." He says, "Architecture becomes more complex in terms of tools, response, programmes and relationships with the environment. We have an R&D unit, and we try to transfer knowledge of the natural world into buildings."

Fusing together creativity, empathy and research ability, Cucinella leads his team to come up with unique solutions for sustainable architecture. One Airport Square in Ghana is a vivid representation of such vision. It is a nine-storey multi-purpose building inspired by local palm trees. After extensive research in this West African country, Cucinella realised that although Ghana has a hot tropical weather all year round, being in the shades can largely reduce the discomfort caused by high temperature. Just as one would stay under the tree to keep cool, keeping the whole building under shade significantly reduces the need of air-conditioning.

"This is an architectural response instead of a technological one." Cucinella says, "Sometimes we consume too much unnecessary energy in buildings. As we understand the relationships between building and nature, we find this to be an architectural problem."

The company also gave birth to an interesting building project inspired by cactus. "We learn something from plants." Cucinella says, "We combine all intelligence together to respond to questions in architecture and design." He also has an interesting way of examining architecture capabilities by comparing it side by side with a plant. The natural ability of a plant to perform tasks like photosynthesis and absorb nutrients from soil leaves Cucinella wondering whether buildings could learn a thing or two from plants. "Maybe we can transfer this knowledge of nature coexistence and apply it to city-scale development." He says.

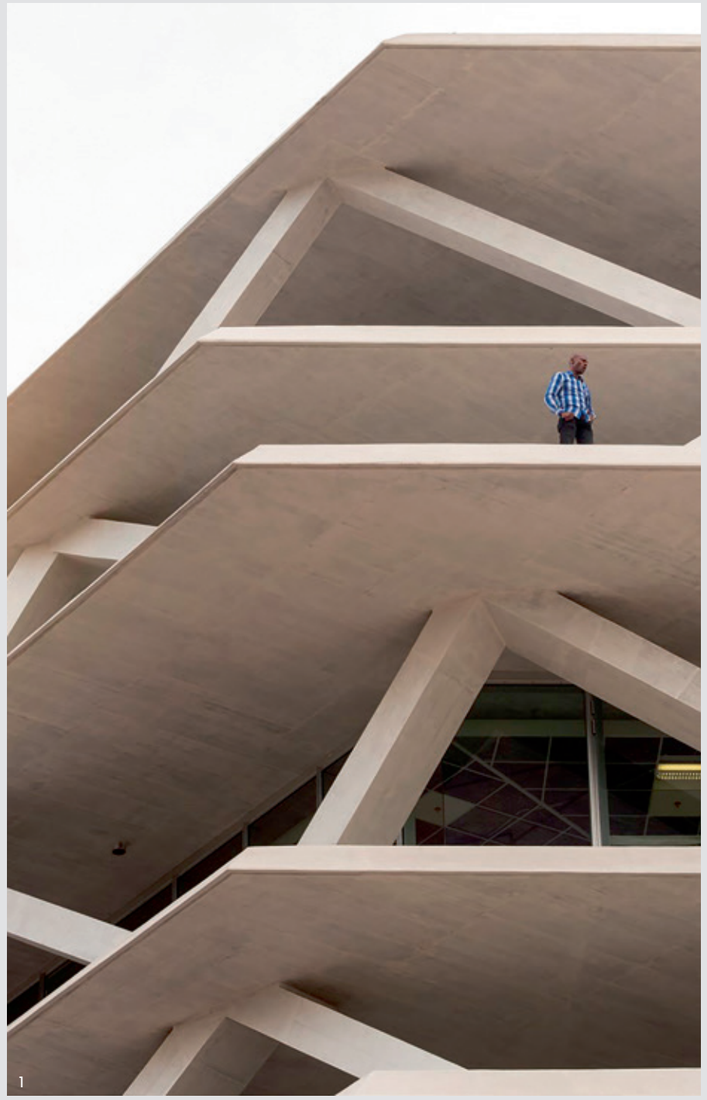
As the entire society strives to achieve zero emission in the next few decades, Cucinella reminds us that the answer might come from the past. "What did we do before we discovered fossil fuel? How did we build?"

In his new book The Future is a Journey to the Past, Cucinella explores the ancient ways of building around the world in different contexts and examines the difference in architecture between then and now. It became clear to him that the architecture today consumes much more energy and looks much more similar to one another. "We don't need to look at the past in a nostalgic way, I'm not a nostalgic person." He says, "What we need to do in the future is to reconnect with our past. We need to rebuild that bridge of knowledge from the past to look into the future."

Cucinella also experimented with such idea. Building with soil has long been a traditional method in various cultures. Cucinella takes it to the next level by introducing 3D printing technology to realise earth architecture. Adaptation is important for these built fabrics, while local humidity and latitudes all play a role in how the end products turn out to be. As architectural responses, Cucinella and team increase ventilation of the buildings in India, while implement big windows to catch enough sunlight in the northern countries.

Apart from the discussion of green architecture and seeking traditional know-hows, Cucinella always has an affection for designing schools. These are where one feels the huge social responsibility of architecture and equal amount of joy and satisfaction when seeing occupants enjoy being in the space. Cucinella says: "Architecture is a common good. We are designing not for ourselves but for others."

In Cucinella's version of a nursery school, all space is dedicated to children. He believes that being inside an architecture is a form of education. "Buildings don't move but they travel in memory." He says, "Schools are magical moments for kids. It's their first place to socialise."


1

香港知專設計學院及意大利駐港總領事館在三月班的第六屆意大利設計日合辦了一場大師班講座，邀請了可持續建築專家和歐洲最具影響力的建築師之一Mario Cucinella Architects (MCA)創辦人Mario Cuccinell，以「Sustainability and Beauty」為題，分享其獨特和精彩的見解。

Cucinella在30年的職業生涯中，為意大利及全球不同地區設計過許多極具代表性的建築，亦憑著其創新的方案贏得多項在環保節能領域的獎項。

在Cucinella寬敞明亮的波隆那及米蘭的辦公室裏，都瀰漫著一種「集體智慧」的氛圍。Cucinella說：「作為建築師，並不代表你只需要創作和建築，你還需要具備工程、設計、調研和鼓勵社會參與等的知識。公司的成功不是單靠一個人，而是要結合不同的智慧，我將這稱為『集體智慧』。」

Cucinella認為，創意和同理心是兩個對於建築師而言十分重要的詞彙。前者不難理解，而對於後者，Cucinella則形容是建築師及作為一個人，怎樣與周遭建立關係的能力。他說：「將創造力與同理心結合就會成為一種掌控，可以為你帶來一種跨界而又非常重要的視角，能夠看到建築、環境和人之間的關聯。」

調研能力是另外一種Cucinella重視的工具。「我們的工作以調研為基礎。」他說：「工具、反應、規劃、與外界關係的改變等都令現代建築愈發複雜。我們有一個獨立的研發小組，並且嘗試從自然界汲取知識，應用到建築上。」

Cucinella結合創造力、同理心和調研能力，帶領團隊提出一個又一個獨特的可持續建築解決方案。位於非洲迦納的建築One Airport Square便是一個好例子。它是一座設計靈感來自當地棕櫚樹的九層高綜合建築物。Cucinella的團隊以大量調研為基礎，發現在這個長年處於熱帶氣候的西非國家，待在陰涼處能大大減少高溫引致的不適。就像人在大熱天在樹蔭下乘涼那般，Cucinella將整座大樓藏在建築元素帶來的陰影之下，大幅降低了冷氣的使用。

「這是一個從建築角度出發的反應，而非從技術上作出的對策。」Cucinella說：「當我們了解建築與自然之間的關係時，我們就會發現許多建築中存在的問題，其實都源於建築概念。有時我們也使用了太多不必要的能源。」

建築工作室還創造出靈感來自仙人掌的建築項目。Cucinella說：「我們從植物身上學到很多，因而結合所有智慧，再從建築設計角度回答問題。」他還運用一個有趣的方式，就是將植物和建築並排在一起作比對，看看設計的建築能力。植物的光合作用、從泥土中吸取養分等自然功能，或許建築能有所領會。「未來的城市發展或許能從自然界的共生模式裏學到一二。」Cucinella說。


2

According to Cucinella, we are currently in a transitional era, realising we need to make changes to the way we build and not quite figuring out how. "What will be the future for buildings? This is also a question for myself."

After 30 years of work, Cucinella wishes to pass on his knowledge to the younger generations. "We founded the School of Sustainability. We thought it's good to give back knowledge to the young generation in terms of how to reach the zero carbon emission goal of United Nations in 2050." With collective intelligence in mind, Cucinella wishes to spread knowledge, exchange vision and jointly create the sustainable future we are all hoping for.


3

全人類現在正努力地尋找能在未來幾十年達致零排放的突破方法，但Cucinella提醒我們，答案或許在過去可以找到。「在未發現石油時，我們如何生活？我們是如何建築？」

在他的新書《未來是一趟過去的旅程》中，Cucinella探討了歷史上世界各地在不同文化和環境中的建築，亦細看了現在及過往的不同建築方式。他了解到現今的建築比以往使用了大量能源，建築與建築之間的外貌更為相似。「我們無需以懷舊的眼光審視過去—我從不是一個懷舊的人。」他說：「我們未來是要連結過去，重建那座跨越過去與未來的知識橋樑。」

Cucinella亦將此理論付諸實行。在泥土上搭建一向都是不同文化中的傳統建築營造方法。Cucinella將這與3D打印結合，創造出更符合當下社會的泥土建築。適應調整對於這些建築是極其重要的，最終的成品亦會受到地域的濕度和緯度等因素而影響於是Cucinella及其團隊便因而在建築上作出回應，在印度的樓房中設計更多換氣空間，而在北歐的泥土樓房中則會加入大面積的玻璃來導入日光。

除綠色建築和尋找傳統知識的議題外，Cucinella對設計學校亦情有獨鐘—設計學校是一個擁有巨大社會責任的建築物，同時，使用者在享受空間時，亦會獲得同等程度的喜悅和滿足感。Cucinella認為，建築是公共利益，建築師永遠是為他人，而非自己而設計。在Cucinella設計的一所保育幼兒園中，所有的空間和角落都為幼童而設。他相信處身於這個建築空間就是一種教育。「建築物不會移動，但它們會在人們的記憶中穿梭。」他說：「學校是孩提時代的魔法時光，是他們初次社交的場所。」

Cucinella 說，我們正處於一個過渡時期，意識到我們要改變建築方式，但又不是很清楚怎樣做。「建築的未來是什麼？這也是我自己的一個問題。」

歷經30年的職業生涯，Cucinella希望將他的知識傳遞給年輕一代。「我們成立了可持續學校，以聯合國於2050年達致零排放為目標，將畢生所學傳授給下一代。」心懷集體智慧的理念，Cucinella希望將知識傳播，與大家交流對未來的想像，一起創造那個我們都嚮往的可持續未來。


4

1. One Airport Square in Ghana is a vivid representation of Cucinella's fusing together creativity, empathy and research ability.
位於非洲迦納的 One Airport Square 便是一個 Cucinella 所主張，結合創意、同理心和研究能力的好例子。

2. Tecla, earth architecture realised by applying 3D technology
透過引入 3D 打印技術呈現的 Tecla 泥土建築

3. Tecla, example of earth architecture in India.
位於印度的 Tecla 泥土建築

4. At Guastalla Nursery School, all space is dedicated to children.
在 Guastalla Nursery School，所有空間都為幼童而設。

CULTURE FUTURE

EMERGING DESIGN TALENTS 2022

The annual show of Hong Kong Design Institute (HKDI) and Hong Kong Institute of Vocational Education (IVE) (Lee Wai Lee) will run from 5 to 21 August 2022.

2022年度展：文化未來

香港知專設計學院及香港專業教育學院李惠利年度展將於 2022 年 8 月 5 日至 21 日舉行。

Culture is in our everyday life. It shapes our group identity and connects people together. Design is the manifestation of Culture. Not only rooting their design in the traditional culture, the new generation of designers also push the boundary of design and establish themselves as the key power of the future of the culture. This year's Emerging Design Talents (EDT) will showcase young designers' creation and let us glimpse the culture's future.

文化是日常生活一部份，構成了我們群體的身份認同，讓人與人連成一起。設計是文化的呈現，新一代設計師創作時，既要回顧歷史，傳承文化，亦需同時探索設計的可能性，成為改變文化未來的關鍵力量。今年的年度設計展將會讓大眾一窺年輕設計師如何以設計思考未來，塑造文化。

Readership Survey for SIGNED
SIGNED 讀者意見調查

Dear SIGNED Readers,
親愛的 SIGNED 讀者：

SIGNED debuted in 2011 and over these 10 more years, it has established itself as a magazine that features world-class and outstanding work in HKDI and the creative and design industries.

We hope SIGNED continues to be of use and interest to you. It would be very helpful to us if you could fill out this short survey.

SIGNED 於 2011 年首次出版，在這十年多的時間裡，一直為大家介紹香港知專設計學院的傑出作品和國際上出色的創意和設計題材。

誠邀您填寫這份簡短的問卷，給予我們寶貴的意見，讓我們做得更好。

English Survey

中文問卷

Thank you for your time and interest in SIGNED.
謝謝。

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