



Homo Ex Data

科 · 然

| The Natural of the Artificial

Activities and Products in the World of Homo Ex Data

在 Homo Ex Data 世界的活動和產品

On the following pages, this book introduces products that make *Homo ex data* possible in the first place. They include products that help collect, process and use data. All of these products have been successful in the Red Dot Design Award.

在下面的頁面中，本書首先介紹使 *homo ex data* 成為可能的產品，包括有助於收集、處理和使用數據的產品。所有這些產品都獲得了“紅點設計大獎”。

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Monitoring

監控



Monitoring 監控

The collection of data on human beings often already begins before they are born – probably in the course of ultra-sound examinations and prenatal diagnostics. Data on foetuses, including, in part, even genetic profiles, are collected, analysed, or compared with reference data in order to create an initial prognosis and diagnosis for the as yet unborn life. Today, human beings are, therefore, already part of the data system often even before they are born – and, thus, digital natives in the true meaning of the word, original natives of the digital world. From the very beginning, they become data-based humans – *Homo ex data*.

Despite all the possible existing ethical concerns with respect to such early data analysis and decisions derived from it, there are many medical cases in which monitoring human data makes sense, if it is not even necessary for survival. If a child comes into the world long before its anticipated due date, it is not yet able to survive on its own. In order to survive, it depends on technology – as well as monitoring and evaluation of its body data. Incubators such as

數據收集往往始於一個人出生之前——例如是在超聲檢查和產檢期間就已經開始。收集、分析或對照參考數據比較胎兒的數據，其中甚至包括一些基因譜，以便為這個尚未來到世上的生命做出第一次的預估和臨床診斷。在當今社會，人們早在出生前就已經是數據系統的一部分——按照字面意思就是數碼原生代，即在數碼時代土生土長的人。這類人從一開始就建立在數據之上——成為一位“Homo ex data”。

雖然這種早期數據分析和由此做出的決定可能導致出現各種倫理問題，但是仍有大量醫療案例表明監控個人數據也是有意義的，可能甚至是生存不可或缺的。如果一個胎兒比預產期提前很多天出生，那麼僅憑他/她一己之力是很難活下去的。他/她必須依靠技

the Dräger Babyleo TN500 IncuWarmer provide premature babies with an optimal microclimate. Highly sensitive sensors facilitate constant monitoring of vital functions as well as of temperature, humidity, oxygen content, and brightness and noise level inside the incubator, and hence reduce work for medical personnel. The still fragile life depends on a stream of data, while the continuous transfer of data links the natural with the artificial, thus assuring survival. This aspect is also expressed in the design of the Babyleo: transparent sides allow viewing and provide closeness to the baby; at the same time the baby lies in a kind of artificial, engineered womb, which screens and protects the child from the surroundings. Thanks to its sensitive design, the Babyleo succeeds in instilling confidence in the basic technology and creating a calming atmosphere.

術才能活下去——並依靠自身身體數據的監測和評估。早產兒暖箱（孵化器）如 Dräger Babyleo TN500 嬰兒暖箱為早產兒提供了最佳的微氣候。高靈敏度的感測器可以持續監測暖箱中的生命功能以及溫度、濕度、氧含量、亮度和噪音水準，並方便醫務人員工作。這個脆弱的生命全靠數據流程支撐，連續傳輸數據讓自然環境和人造環境融為一體，由此確保生命的延續。這一點也體現在 Babyleo 的設計中：箱壁透明，一覽無遺，能讓父母與寶親密接觸。同時這種科學人造子宮可以保護孩子，使其與環境隔絕。Babyleo 憑藉其靈敏的設計成功喚起了對基本技術的信心並創造了一種舒緩的氛圍。



Enobio 2 StarStim

Brain-Monitoring Helmet
腦監測頭盔

Manufacturer 生產廠家
Neuroelectrics
Barcelona | Spain
Design 設計
ÀNIMA design, ÀNIMA Barcelona
Barcelona | Spain
www.neuroelectrics.com
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Dräger Babyleo® TN500 IncuWarmer

Incuwarmer
初生嬰兒保溫箱

Manufacturer 生產廠家
Drägerwerk AG & Co. KGaA
Lübeck | Germany
Design 設計
MMID GmbH
Essen | Germany
www.draeger.com



Digitizing

數碼化

Digitalising 數碼化

Whereas photography at its beginning was purely a matter of chemistry and mechanics, today's digital photography is based on highly advanced technology. This makes it possible to capture reality within fractions of a second by means of electronics and light sensitive chips, and convert it into digital images. This technology is found not only in digital cameras, but also in every smartphone and tablet, and is thus available to anyone at any time. In the past ten years, the smartphone in particular has revolutionised how we take photographs. Today, billions of photos are taken every day, an average of about 800 photos are posted on Instagram alone – every second¹. At the same time, the cameras are merely what stand out periscope-like in an enormous, undulating sea of digital image data and supply new photos. There are already many new devices and services that are able to link photos with additional information such as coordinates, weather information, or facial recognition. Incredible amounts of visual data therefore flow back and forth between devices, hard drives and storage discs, social media and Cloud services, giving rise to a sea of image data.

¹ Source 參考網站: www.internetlivestats.com

攝影一開始是純粹的化學和力學產物，現今，數碼攝影已經是一門高度發達的技術。它讓我們可以通過電子光感晶片在幾分之一秒內捕捉現實，並將其轉換為數碼圖像。這項技術不僅應用於數碼相機，還用於每部智能手機和平板電腦，並且可供任何人隨時使用。特別是過去十年間，智能手機徹底改變了我們的拍攝方式。現今，每天數十億張照片被拍下——僅在 Instagram 上，每秒就發佈約 800 張照片¹。相機這時候就像是徜徉在汪洋數碼圖像數據大海中的潛望鏡，並不斷提供新的照片。現在，很多設備和服務已經可以為照片標上附加資訊，如座標、天氣資訊或面部識別。因此，在設備、硬碟和磁片、社交媒體和雲端服務之間流動的視覺數據多到難以想像，而且這片海洋還在繼續增加圖像數據。

By far the majority of photos are shot with smart-phones. Yet the market for classical digital, compact or system cameras is rebounding. Whoever picks up such a camera wants to take more than just snapshots. This appreciation of photography can be seen in the design of the camera models: many of them are constructed of high quality materials, precisely engineered, and perfectly balanced. This is also true, for instance, in the case of the system camera Olympus Pen, which pays homage to analogue photography in its design, but conceals the most modern optical technology inside. Ease of operation also plays a central role for all cameras. User friendliness or usability is important so as to make it possible to use all the technology contained in the camera intuitively.

其中，大部分照片是用智能手機拍攝的。不過傳統數碼、微型或系統相機市場也在復蘇。這樣一個相機在手，肯定不會只想拍快照。攝影的價值也體現在相機型號的設計上：它們大多是用優質材料製造而成，經過精確加工和調整。奧林巴斯 PEN 相機就是這樣一款系統相機，它雖然是向菲林攝影致敬，但是內部卻配有最現代的光學技術。此外，對所有相機而言，簡易操作也是關注焦點。設備中的所有技術必須方便用戶使用。



Luna

360-Degree Camera 360° 相機

Manufacturer 生產廠家

Memora Inc.
Palo Alto | CA | USA
Memora APAC Co., Ltd.
Taipei | Taiwan

In-house design 內部設計

Ju-Chun Ko, Chiang Fon,
Sunny Chou, Tai-Pei Wang,
Dora Lee, Jackie Chia-Hsun Lee,
Servando Canales, Gaurav Gupta,
Yi-Hao Yeh, Kevin Lin
www.luna.camera



Observing

觀察



PowerEye

Quadcopter 四軸飛行器

Manufacturer 生產廠家

PowerVision Technology Co., Ltd.
Beijing | China

In-house design 內部設計

Brian Yuan

www.powervision.me

Observing 觀察

Drones, originally developed as flying practice targets for military uses, hold enormous potential: They extend people's operating range by being remotely controlled or moving autonomously and hence create distance between the person and the action that he or she has initiated. This distancing can be problematic, but is nonetheless helpful in many cases. As transport drones, for example, the machines can be flown over crisis regions to deliver medication to remote areas without risking lives. And, when equipped with cameras, drones broaden our horizons: They provide us with magical views and insights that could previously only be obtained from conventional aircraft or helicopters. This flight with a bird's-eye view is not only fascinating, but meanwhile available to a broad public as well. Because, even though drones are equipped with ever more complex technologies, they are also becoming ever smaller, lighter, more affordable – and easier to operate – at the same time.

最初專門為軍事飛行訓練而研發的無人機具有巨大的潛力：它們通過遠端控制或自主移動來擴大人的活動範圍，通過這種方式為人及其發起的活動之間創造距離。此距離可能會引發問題，但是在大多數情況下是有利的。以運輸無人機為例：機器能夠飛越危險區域，向偏遠地區提供藥物，且不會危及人的生命。當無人機配上相機時，我們的視野就變大了：它們給了我們神奇的眼界，可以看到以前只能在飛機或直升機上看到的景象。這種鳥瞰式觀光不僅令人著迷，現在還能供更多的人使用。雖然無人機採用的技術越來越複雜，但是它們正在日益變小、變輕，更經濟實惠，更易於操作。許多這些四軸螺旋槳或多軸螺旋槳飛行器早就不再只由訓練有素的專業人士控制，人人也可輕易上手。在這項發展中設計師們起到了很大作用：他們設計人機互動系統，並說明我們可以盡可能簡單地操控這些機械人在我們之上懸停以及環繞我們的身體飛行。



For a long time now, it has been possible for anyone to control such quadro- or multicopters for civil applications, not only trained operators. Designers have played a big role in this development: They have designed human-machine interaction and thus contributed to the fact that these flying robots, which move through the air around us and over our heads, are as easy as possible to operate.

The design of the Hover Camera, an autonomous minicopter fitted with a camera for recreational use, which is optimised above all for selfies, is particularly successful in terms of interaction. The Hover Camera can be steered playfully by means of gestures and smartphone and simply caught in the hand, since the rotors of this extremely light quadcopter are protected inside a sturdy, cage-like housing. Integrated AI technology also employs face and body recognition so that, when in autonomous mode, the drone swirls around users or follows them like an object in standby. The Hover Camera thus offers seemingly natural, emotionalised human-machine interaction that guarantees a great degree of control – and is therefore lots of fun.

Hover Camera 堪稱是一款特別成功的互動設計，它是一部配備攝錄機的自主迷你無人機，用於休閒娛樂，最適合用於自拍。通過手勢控制和智能手機就能像玩遊戲一樣導航 Hover Camera，而且還能將其直接拿在手裡，這是因為四軸螺旋槳飛行器非常輕，還有一個堅固的籠狀外殼。整合的人工智能技術還使用面部和人體追蹤功能，因此該無人機在自主操作模式下就像是一個待命的物件，對使用者進行跟拍或環拍。Hover Camera提供的人機互動功能既自然又富有情感，在確保高度控制的同時輕鬆帶來樂趣。

Hover Camera

Drone 無人機

Manufacturer 生產廠家
Zero Zero Robotics Inc.
Beijing | China
In-house design 內部設計
Mengqiu Wang, Guanqun Zhang
www.gethover.com



Processing

數據處理

Processing 數據處理

In the past, all the data that are today collected in digital form – as described in the previous chapters – were processed, evaluated, and translated into actions only by people. In the age of digitalisation, however, people no longer only rely on their own intelligence. Instead, data are fed into Big Data systems, cross-checked with other data, put in relation to each other, dissected by algorithms, sorted anew, and evaluated. Today, these networked systems are so complex that they far exceed the comprehension of a single person and, paradoxically, are nonetheless able to provide diagnoses or recommendations for action that are much more individual. The sheer quantity of (comparative) data alone makes human beings calculable in the truest sense of the word. At the same time, the data make it possible for people to perform highly complex calculations. People are therefore simultaneously subject and object in a continuous data transfer. The intermediaries between human beings and Big Data are, in turn, mainframe computers and servers, personal computers, tablets and smart-phones, wearables, storage devices, and intelligent devices and machines. Such devices are black boxes

正如“收集數據”章節中描述，所有現今以數碼化形式收集的數據，以前都是由人進行處理、評估和執行。在數碼化時代，人類不再單獨依賴個人智力，而是將數據輸入大數據系統，與其他數據進行匹配，剖析其中的關聯，分析算法，再做整理和評估。弔詭的是，雖然現今這類網路系統之複雜程度已遠遠超過一個人所能理解，但這一系統卻能給出更為個性化的診斷意見或者行動建議。單純龐大的（對比）數據從原本詞意而言使人類變得“可計算的”、可預計的。同時，這些數據也使人類能夠自行進行高度複雜的運算。人類在數據傳輸中同時既是主體又是客體。人與大數據之間的介質仍然是大型電腦、伺服器、個人電腦、平板電腦、智能手機、穿戴設備、儲存設備以及其他智能設備和機器。這些設備都是黑盒，所有複雜的流程全部在其內部進行。黑盒機制開始是在相機研發中得以運用。突然有一天，現實的景物不再

within which complex processes take place. These black boxes got their start in the development of cameras. All at once, reality was no longer reproduced by hand in the form of a drawing, but depicted true-to-reality by complex physical and chemical processes inside the camera, without direct intervention by human beings. Everything that happened between pressing the shutter release and the finished image escaped the observation and knowledge of by far the majority of people, thus lending the device a mysterious aura. Concealed in today's black boxes are calculations, algorithms, data clouds, access to the internet, virtual reality, and neuronal networks – in short, Big Data. All this can potentially be accessed and used via these black boxes.

是人工畫作的形式得以再現，而是通過複雜的物理和化學過程在相機內部，不通過人直接接觸就將景物真實再現。在按下快門和成片出來之間所發生的一系列玄妙遠遠超過了大多數人的認知。而如今的黑盒中隱藏着的是運算力、演算法、數據雲、接入互聯網的接口，以及進入虛擬現實和神經網絡的接口等——簡而言之：大數據。這些一切都將潛在通過黑盒得以實現和利用。



ROG Maximus IX APEX

Motherboard 電腦主板

Manufacturer 生產廠家
ASUSTeK Computer Inc.
Taipei | Taiwan
In-house design 內部設計
www.asus.com

This complexity inside devices is juxtaposed today with the most purist possible design of the housing, as, for example, in the case the HP Elite Slice Desktop Computer. Things generally first become really exciting when the design of machines breaks with this purism. For instance in the field of gaming, where the performance of the individual components is of utmost importance and users therefore like to assemble the optimal computer for their requirements themselves, while both housing as well as elements such as motherboard or graphic card express power and aggression as a result of their distinctive design. One example of this is the motherboard ROG Maximus IX APEX.

如今，相對於設備內部的複雜性，外部機箱則要盡可能設計簡約，惠普的Elite Slice桌面電腦就是一個典型的例子。當機器的設計與純粹主義完全相悖，將是一個更有趣的情況。例如在遊戲領域，對單獨部件性能要求極高，所以用戶喜歡按最優化的要求自行組裝，無論是機箱還是其他組件如主機板或者顯示卡，其設計都要能彰顯出張力和侵略性。一個典型的例子便是ROG Maximus IX APEX主機板。



HP Elite Slice

Computer 電腦

Manufacturer 生產廠家
HP Inc.
Palo Alto | CA | USA
In-house design 內部設計
HP Design
Design 設計
Native Design
London | Great Britain
www.hp.com

Optimizing

優化





System Electric Greifer DMC VariPlus

Hand Prosthesis 義手

Manufacturer 生產廠家
Otto Bock Health Care
Products GmbH
Vienna | Austria
In-house design 內部設計
Annette Sting
www.ottobock.com
Page 114 | 115

Xkelet

Custom-Made Orthosis
可定制醫用矯形器

Manufacturer 生產廠家
Xkelet Easy Life S.L.
Girona | Spain
In-house design 內部設計
Andreu Carulla Studio
www.xkelet.com

Optimising 優化

The moment when human beings no longer accept their own biological weaknesses as simply natural or God-given, but instead optimise their bodies or senses by making use of the technological possibilities available to them, they enter into the realm of transhumanism. This is also where the boundaries between human being and machine become blurred, since artificial components become part of the natural organism and the artificial enters into a symbiosis with the natural. Design plays a big role here when it comes to the acceptance of prostheses or similar items. Either because such components are designed to be as natural as possible in appearance and motion so that they cannot easily be identified as artificial – or exactly the opposite, i.e. designed to intentionally emphasise the artificial. The latter ensures that the wearer presents his or her technologically optimised and occasionally even superior, artificial body part with self-confidence.

當人類不再將自己身體的限制單純地視作自然或上帝賜予的，而可以科技改善其身體機能及感官質素，人類便已進入了超人本主義的領域。由於人工部件被整合到自然人體中，人造的與自然的和諧共生，因此人與機器的界限也將不復存在。設計能令人更能接受的義肢，要麼讓這類配件看上去儘可能像真“自然”並可活動自如；要麼完全相反，故意讓人們知道，這是一件人造物品。後者讓佩戴者自信其所佩戴的義肢技術領先，甚至超越了自然身體的功能。

例如Otto Bock公司製造的DMC VariPlus電動義手系統可以方便地與普通義肢互換，並有着精準的抓取功能。其簡約而功能性的設計，讓人們看到這件特殊的肢體時馬上認為這是一件具有高

One example of this is the System Electric Greifer DMC VariPlus from Otto Bock: With its special arm prosthesis, it can be exchanged for a normal artificial hand and then offers precise gripping functions. With its reduced, strictly functional form, this special attachment calls to mind a high-quality tool – which it actually is. The addition of an LED lamp to illuminate the work area further underscores this impression. The gripper therefore enables the wearer to once again perform filigree activities and handle heavy equipment independently and confidently.

New technologies such as 3D printing also make it possible to manufacture medical prostheses and orthoses very individually and cost-effectively based on specific body data. The Xkelet, for instance, is an orthosis for immobilising damaged bones, which is made to measure by means of 3D printing. For this, the affected limb is scanned and measured. These data provide a 3D model that can be configured further using an app. An orthosis that is individually manufactured in this way offers greater comfort and mobility in comparison with rigid dressings and is also more hygienic; furthermore, its futuristic appearance delights.

價值的工具。額外附加的LED燈照亮著工作區域，更強化了這一印象。而且，這套具備抓取功能的義手系統能讓其佩戴者獨立自信地完成精細動作，又能操作重型設備。

此外，新科技如3D打印技術能夠讓醫學義肢和矯形器依據佩戴者的身體數據，以低成本定製。譬如憑藉3D打印技術製作，用於固定受傷骨頭用的Xkelet矯形器。製作這個矯形器的第一步便是對相關肢體部位進行掃描測量。這些數據會產生一個可在App上作進一步調校的3D模型。這類依據個人特點製作的矯形器較石膏繃帶相比，佩戴更加舒適，更易活動，也更為衛生；此外，它極具未來主義風格的外觀也容易為人們所接受。



Interacting



互動



Pudding BeanQ

Robot for Early
Childhood Education 幼兒教育機械人

Manufacturer 生產廠家
Intelligent Steward Co., Ltd.
Beijing | China

In-house design 內部設計
Yi Chen, Feizi Ye, Tingting Xue,
Bin Zheng, Haichen Zheng,
Yong Zheng, Jian Sun, Ye Tian,
Xue Mei, Fan Li
www.roobo.com

Interacting 互動

While, a few decades ago, robots still belonged to the realm of science fiction, they are today increasingly becoming part of our day-to-day life. Technology and Big Data have meanwhile become so advanced that the artificial creatures are able to take on ever more tasks. Robots are, so to say, the quintessence of this technological development. They function and operate on the basis of the gigantic amounts of data that digitalisation has created and, by means of constant feedback loops and machine learning, will be able to act ever more intelligently and independently in the not too distant future. Experts have long spoken about the greatest breakthrough since the Industrial Revolution. And just as at the beginning of the machine age, many people today regard the beginning of the robotic age with mixed feelings. The question that is therefore gaining in significance is how robots can be designed so that they are not seen as a competition or threat, but will instead accepted in future as a natural part of our lifestyle and working life.

數十年前，機械人還只是科幻世界的想像，而如今已漸漸成為現實生活之一部分。科技與大數據技術同時突飛猛進，人工智能也發揮起越來越重要的作用。機械人便是這種科技發展的典型代表。這些機械人的功能與運作是以數碼化所帶來的大量數據的基礎而實現，並將通過不斷地反饋以及機器學習，在不遠的將來實現更為智能、更為自主的運作。專家們說，這是自工業革命以來最大的一次鉅變。就如當年機械時代肇始，當今很多人也對機械人時代的到來懷有頗為矛盾的心態。該如何設計機械人，從而不要讓其被認為是競爭或者威脅，而是我們未來生活與工作中理所當然的一部分，已成為越趨重要的問題。至目前為止，機械人的普遍形象深受流行文化的影響——譬如電影、書籍、動漫等一大多被描繪成機器或者人形機械人。

The general image of robots so far has been dominated by pop culture – by films, books, comics and manga – whereby what prevails is either the machine aspect or the humanoid, which focuses on the side of robots that is similar to human beings.

In the case of service or educational robots, hence robots that are found above all in the domestic and health care field, the focus is on the latter, i.e. at least on a distantly humanoid design. The reason for this is that personal robots are robots that assist people and are supposed to interact with them directly. To establish this kind of personal relationship, when designing robots and their human-machine-interface, manufacturers and designers focus primarily on two elements: language and eyes. Communication by means of a language-based user interface makes interaction with the machine easier and lends it a certain naturalness. Equipping a robot with eyes, on the other hand, enhances the ability to make contact, since a look from big, wide eyes winking or closing suggests liveliness and creates sympathy – even if the eyes are only a graphic representation on a display.

服務性機械人和教育機械人主要用於家庭和護理領域，其設計儘可能接近人形。因為機械人的功能是協助人類，應當可以與其直接互動。為了能夠建立起這類關係，製造商和設計人員在設計機械人及其人機互動面時主要着眼於兩點：語言與眼睛。以語言為用戶面將使人機交流互動變得更為簡單，也賦予了機械人更多人性的一面。設計有眼睛的機械人，是為了與用戶建立起良好的關係，因為從又大又圓的眼睛中投來的目光，眨眼或閉眼都能給人充滿活力和同情心的印象——即使這對眼睛僅是屏幕上的圖形畫面。

The small personal robot Pudding BeanQ is a successful example of the form that an intelligent, interactive robot can also take. The robot, which was designed especially for small children, is able to play with children, teach them, or play back video chats. It therefore represents a new design for a robot – its organic formal language calls a bean to mind. This kind of infantilised form dispels any impression of the robot being a threat and touches observers emotionally. The human-machine interaction also has a particularly child-friendly design. The large face area emphasises the focus on children and an extensive miming repertoire simplifies communication thanks to the wide range of emotions portrayed.

小型機械人布甸豆豆智能機械人 (Pudding BeanQ) 便是一個成功案例，足以說明一個智能互動機械人還能呈現甚麼樣的形式。這個專為嬰幼兒設計的機械人可以和孩子們一起玩耍，給他們上課或視像聊天。同時，布甸豆豆機械人還為機械人設計提供了全新的設計概念，其有機的設計語言讓人聯想到豆子。其孩子氣造型不再給人威脅，並能激發起旁人的情感。尤其是適合孩子的人機互動設計。大臉蛋設計更是強化了適合兒童的設計語言，而且形形色色的表情指令表達多種情緒，讓交流變得更為簡單。



PuduBOT

Service Robot 送餐服務機械人

Manufacturer 生產廠家
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Technology Co., Ltd.
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Peng Chen
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Homo Ex Data –

The Natural of the Artificial

科・然

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Idea and Concept 創意與概念

Peter Zec

Project Supervision 項目總監

Vito Oražem

Project Assistance 項目助理

Gretha Lösch-Schloms

Exhibition 展覽

Project Management 項目管理

Nils Borghs
planungsbüro vierfahrt/4F
Essen | Germany 德國埃森

Project Management at Hong Kong Design Institute and Institute of Vocational Education (Lee Wai Lee)

項目管理 — 香港知專設計學院及香港專業教育學院 (李惠利)

Principal 院長

Dr Ong Lay Lian 王麗蓮博士

Project Management Team 項目管理團隊

Joy Wang, Curator 汪文鈺, 館長
Vicki Wong, Assistant Curator 黃穎瑩, 助理館長
Ruth Ng, Assistant Curator 吳苑瑩, 助理館長
Kaitlyn Liu, Curatorial Officer 廖愷滢, 展覽策劃主任

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Editors 編輯

Burkhard Jacob
Vito Oražem
Peter Zec

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Texts 文字

Astrid Ruta
Peter Zec

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Maren Reinecke
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Michael Jaeger
Düsseldorf | Germany 德國杜塞爾多夫

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Patrick Conroy, Lanarca, Cyprus 塞浦路斯拉納卡
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Tara Russell
Dublin | Ireland 愛爾蘭都柏林

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Berlin | Germany 德國柏林

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