

# 数字之维

# MIND ING THE DIGITAL

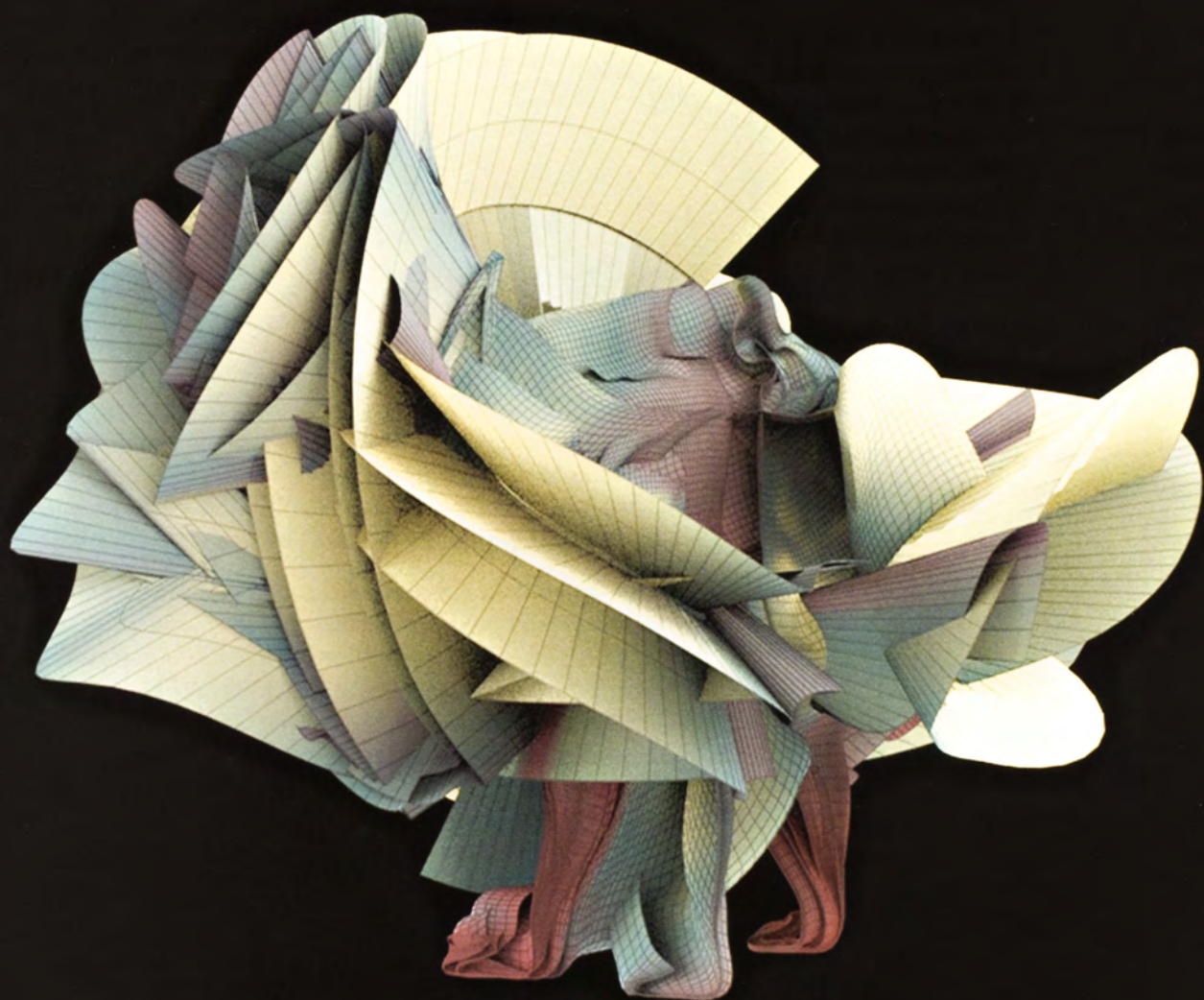


设计互联 编  
Edited by Design Society

DESIGN  
设计互联  
SOCIETY



同济大学出版社  
TONGJI UNIVERSITY PRESS



萨拉·肯德戴、邵志飞

Sarah Kenderdine & Jeffrey Shaw

# THE CONJUNCTION OF NEW MEDIA ART AND CHINESE CULTURAL HERITAGE

新媒体艺术与  
中国文化遗产的联结



在数字化实践中，一直以来我们关注的重点都是在新设计形态中，技术如何催生新的设计，从而加速未来生活的发展及提高生产力。虽然数字化世界鼓励我们追求新的生活模式与交互体验，但为了我们的下一代，文化创意实践者对传统遗产的保护意识日渐提升。艺术与设计是数字化技术与文化遗产之间的重要媒介，能够以更具创意的方式来帮助我们加强与过去的联系。

本文中，两位该领域的先锋艺术家和学者，邵志飞 (Jeffrey Shaw) 与萨拉·肯德戴 (Sarah Kenderdine) 详细介绍了从增强现实 (Augmented Reality, AR)，到动作捕捉 (Motion Capture, MOCAP) 等数字化技术的应用。以更有趣和更为平易近人的方式为公众提供了重新参与我们传统文化记忆以及感受文化身份认同的可能性。

传统文化遗产正日渐受到各种因素的威胁，这使得利用数字化工具保存文化遗址和历史材料变得非常重要。当今美术馆和博物馆的重任之一便是创建平台，让社会大众能与传统文化进行交互，并以现代人的身份体验传统文化遗产。在这些交互场景中，多元化的学术研究详述了对传统文化的再现，观众的参与丰富了对传统文化的反思。因而，传统文化的演绎职权得到再分配。

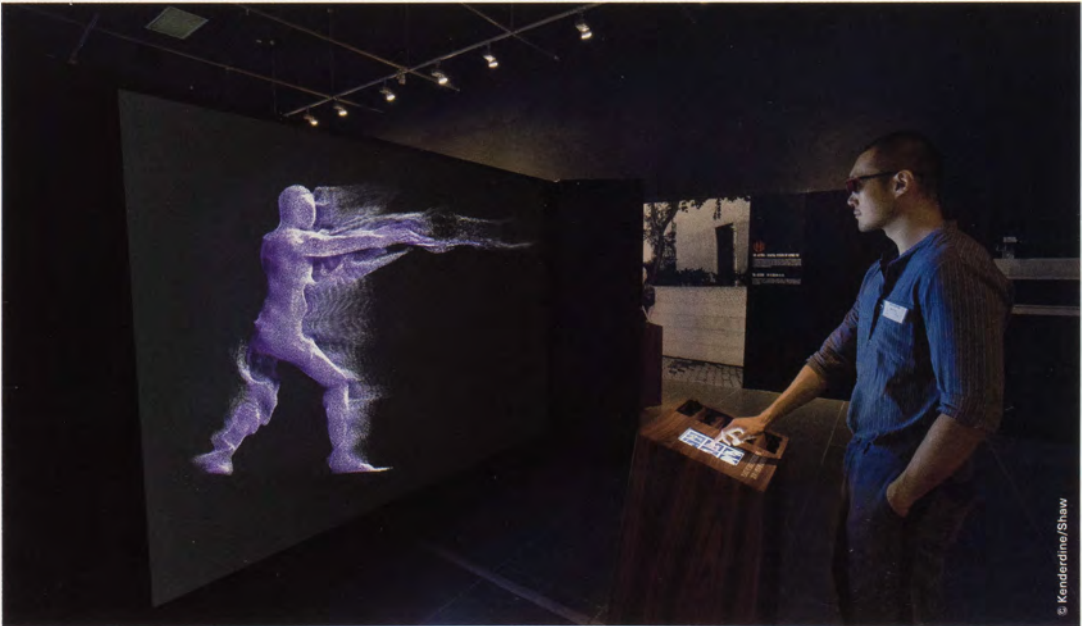
本文的两位作者曾多年在澳大利亚新南威尔士大学 (UNSW Australia) 和香港城市大学教学，在那期间便对丰富的亚洲和中国文化遗产进行研究。本文谈及的两个作品“重演者：互动功夫分析论” (RE\_ACTOR: Interactive Kung Fu Analytics) 及“极乐园 (增强现实版)” (Pure Land AR) 均运用了新媒体艺术的美学和概念策略，打造沉浸式、互动式、具有存在感和参与感的体验。这些作品重新探讨文化氛围和真实性的概念，让受众把数字记录转化成活生生的社会参与。

The digital documentation of cultural heritage sites and historical materials plays a vital role in sustaining legacies that are increasingly under threat. A core mission for galleries and museums today is to create a platform for society to stage interactions with the past and to experience cultural heritage as a living present. In these sensorial environments, representation is amplified by multimodal approaches to scholarship, contemplation is enriched by affective audience participation, and the authority to interpret objects has been redistributed.

Having been based at UNSW Australia and City University of Hong Kong for many years, the authors have taken the opportunity to engage their research practices with the rich traditions of Asian and Chinese cultural heritage. The two installations discussed in this chapter – *RE\_ACTOR: Interactive Kung Fu Analytics* and *Pure Land AR* – utilize the aesthetic and conceptual strategies of new media art to create experiences that are defined by attributes of immersion, interaction, perceptual ‘presence’ and participation. These artworks re-examine notions of aura and authenticity and enables audiences to translate the digital record into living narratives of critical social engagement.

In our digital pursuit, there has been strong emphasis on the application of technologies in new forms of design to accelerate our lives and maximize our productivity in the future. While the digital world is encouraging us in pursuing new models and interactions, cultural and creative practitioners have raised concern for the preservation of our heritage for our future generation. Art and design are the key mediators between digital technologies and heritage to strengthen our connection with the past in creative ways. In this article, Jeffrey Shaw and Sarah Kenderdine – who have been pioneering artists and academics in this field – explain how digital technologies from augmented reality to motion capture have opened up engaging ways for the public to re-engage with our cultural memories and identities in interesting and accessible ways.

“重演者” 参展2016年  
“三百年客家功夫  
——文化遗产的数字化未来”  
RE\_ACTOR installation at  
the 2016 exhibition  
'300 Years of Hakka Kung Fu –  
Digital Vision of its Legacy and  
Future'.



重新编纂身体记忆知识

身体记忆，因其“活”而难被归档记录。身体记忆的传统被包括在非物质文化遗产的表现形式中，因为其重要地位需要得到重新演绎。如果说借助身体的重新演绎是表现的一种形式，那就意味着在依托身体进行知识传达的永续链中，数字假体（Digital Prosthesis）亦占据一环。

动作捕捉（MOCAP）是一种数字记录技术，其利用大量红外相机来记录附着在移动个体上的反射标记，以便在后期制作时能以数字化技术克隆出这些移动个体。动作捕捉技术的特别之处在于当其与合适的传递平台相连时，能把身体动作转化为可传递的知识。虽然这样的数字化档案并不能涵盖人类交流的所有领域，但它可以作为整个社会知识链的支架，去传递那些可能会因原有知识所有者的缺失而被损坏的知识。因此，数字化档案给予我们一个动态的资源让各类文化实践的生命力得以延续。

非物质遗产的记录过程不断变化，因此通过把编纂数据恢复成身体记忆的形式，能够让文化实践回归其人类中心本体论的状态。人们一向认为档案是停滞的，若要充分发挥档案的潜能，重新唤醒其全部能力，需要倚赖创新的捕捉技术以及沉浸式和互动式展示体系的应用，以档案来促进体化交互的发展。动作捕捉技术的有效性，即数字化功能的可见性，能够改变我们感知身体记忆知识的方式；我们在作品“重演者：互动功夫分析论”中对此进行了探讨。此外，托比亚斯·格雷姆勒（Tobias Gremmler）的作品“客家功夫动态可视化”（Hakka Kung Fu Motion Visualization），则通过数字方式详细呈现了客家功夫在时空中的运动，创造出多重维度的视觉分析和表达，展现了一种剖析功夫表演本体的“深刻视角”。

CODIFYING EMBODIED KNOWLEDGE

Embodied memory, because it is 'live', exceeds the archive's ability to capture it. Applied to intangible heritage, this means that embodied traditions are involved in acts of representation because their very status as tradition necessitates re-enactment. If re-enactment through the body is a form of representation, this suggests that a space exists for a digital prosthesis within the continuous chain of embodied knowledge transfer.

Motion capture (MOCAP) is a digital recording technology where numerous infrared cameras track reflective markers that are attached to the performers body so that in post-production a digital facsimile of that person's embodied performance can be re-constructed. MOCAP provides a unique capacity for translating physical action into trans-ferrable knowledge when paired with appropriate interactive platforms that can help aid transmission. While such a digital archive does not cover the gamut of human exchange, it can serve as a synthetic scaffold in a chain of social knowledge transfer that may otherwise be broken by the absence of the original knowledge holders. This archive provides us with a dynamic resource that can bridges ruptures of continuity in cultural practice.

The transformative process of codifying intangible forms can return cultural practice to its anthropocentric ontological status by restoring codified data to its embodied form. The optimisation of the archive's potential and the reactivation of its repertoire is supported by this innovative capture method and through the application of immersive and interactive display systems facilitating embodied interaction with the archive. The new media art installation *RE\_ACTOR: Interactive Kung Fu Analytics* shows the way in which motion capture can be a digital affordance that changes the way we perceive embodied

“极乐园（增强现实版）”  
参展2012艺术香港及第九届  
上海双年展  
The PURE LAND AR  
installation at Art HK 2012  
and 9th. Shanghai Biennale





“极乐园（增强现实版）”  
参展2012艺术香港及第九届  
上海双年展  
The PURE LAND AR  
installation at Art HK 2012  
and 9th. Shanghai Biennale



## 非物质文化遗产的再现

传说中国武术起源于四千多年前的夏朝，并衍生出上百种不同的流派。香港武术生活档案馆（Hong Kong Martial Arts Living Archive）将新媒体技术和知识共享的概念相结合，展示了一种全面维持文化实践的生命力。他们使用了包括摄影、影像和动作捕捉技术等多种数字化方法，详细记录香港功夫的方方面面。迄今为止，香港城市大学已使用动作捕捉技术记录了130种功夫大师的招式（约占所有武术招式的50%）。档案库中的材料以多重数字化或多媒体的方式，创造出一种记忆“假体”，这种记忆突出了身体作为承载全部技能的中心场所和知识架构的地位，也凸显了这些实践作为一种生活哲学对我们生活方式的影响。在文化遗产的语境中，互动平台的出现造就了一种参与模式，将公众置于文化遗产再生的行为中，这就是所谓的“文化遗产的社会生产”，即作为在体内复原知识的方法。一旦人们对文化遗产进行积极的诠释和建构，他们的体验是社会化和合作性的，跨媒体互动也会变得极有影响力。对连接过去、现在和未来而言，将技术基础设施和多媒体相结合，提倡社会化互动都是极为重要的步骤。

“重演者：互动功夫分析论”这件作品充分利用了媒体科技和动作捕捉技术，构建出一种分析文档编制和可视化的方法论，以及一个体验、赏析和理解的平台。这件装置作品的设计独具匠心，以创意非凡的方式呈现了功夫大师的动作捕捉档案记录，同时也对其进行了具有互动性的探索。通过对四种不同的动作捕捉数据集进行数字化处理，并以动态动作可视化的方式呈现，观众能更好地感受和分析功夫动作背后暗藏的“秘笈”。每个功夫动作都以六种不同的可视化方法呈现；其中，作品可令观众追踪功夫演员身体每一部分的动作路径，同时也呈现了演员身体的运动速度和位移。这件作品对功夫大师的动作进行了动态捕捉和重新表现，为我们呈现

knowledge. Together with Tobias Gremmler's *Hakka Kung Fu Motion Visualization*, these installations present a 'deep vision' of the kung fu performative body by digitally expanding its movements in time and space to create new dimensions of visual analysis and expression.

## RE-PRESENT INGINTANGIBLE CULTURAL HERITAGE

According to legend, Chinese martial arts originated during the semi-mythical Xia Dynasty more than 4,000 years ago, and hundreds of styles have developed over the centuries. The Hong Kong Martial Arts Living Archive is a comprehensive and ongoing approach to sustaining the life of these cultural practices. Combining new media technologies with a knowledge transfer objective in a holistic view of heritage, a detailed inventory of Hong Kong Kung Fu is being produced using diverse digital methods including scanning, photography, video and motion capture. With respect to the latter over 130 performances by Kung Fu masters have been recorded in City University of Hong Kong's motion capture studio (equating to 50% of the repertoire thus far). The multimodal character of this archive's materials contributes to the creation of a multimedia prosthesis for memory that foregrounds the body as the holder of knowledge and the consideration of these practices as philosophies and ways of life. When communicating this archive, the utilization of interactive platforms allows for engagement that situates the public in the act of re-producing heritage as the means by which to reinstate knowledge in the body. Furthermore, when people take active roles in the interpretation and construction of heritage, their experience becomes social and collaborative. This conjunction of technical infrastructure, multi-modal content and social interaction constitutes a powerful 'modus operandi' for embodied experience and knowledge transfer between the past, present and future.



功夫大师李天来在香港城市大学动作捕捉中心演练螳螂拳  
Master Li Tin Loy demonstrating Chow Ka Preying Mantis in the MOCAP studio at City University of Hong Kong

了一个全景式的虚拟环境。六个独立的屏幕各以60度的范围展现了六个不同的角度，绕演员一周进行摆放，以360度全景呈现。每个屏幕都配有一个交互控制板，观众能够从这些由动作捕捉数据生成的六种动态图像中任意选择观看。

对基于时间数据采集而来的动作进行分析和艺术化构建，将观众的参与置于功夫体化知识的中心点。这件作品也对功夫大师的动作进行了数字化重现，让我们在享受和欣赏这些逼真的武术传统的同时，能够产生新知识。通过建立数字档案，使无形的传统具象化，让重要的文化实践不致失传而成为历史，并能够继续发挥文化传递作用。动作捕捉可将身体的动态转化为数据。这创造了一个新的情景，从中，设计可以体现数字化如何帮助保育非物质文化遗产中那些转瞬即逝且难以理解的知识，同时传递身体记忆知识。尽管记录短暂存在的事物、编纂不言而喻的惯例和调停体化事物在理论上存在困难，但数字化策略能帮助我们延续这种非物质文化遗产的生命力。与此同时，通过对客家功夫的姿势和身体条件等方面提出深刻见解，“重演者：互动功夫分析论”这件作品旨在倡导广泛的公众参与，用数字化策略来对现在和未来世代的综合知识资源进行研究。

*RE\_ACTOR: Interactive Kung Fu Analytics* is an interactive art installation that leverages media technologies and MOCAP to constitute a methodology of analytical documentation and visualization as well as a platform for tangible experience, appreciation and understanding. Dynamic motion visualization of four different motion capture data-sets have been digitally processed and re-visioned so that the viewer can better perceive and analyse various 'hidden' aspects of the Kung Fu movements. Each of these performances is presented in six different visualization styles that trace the temporal paths each of part of the Kung Fu actor's body and give formal expression to the relative movement, speed and spatial displacement of performer's body. The artwork constructs a panoptic virtual environment within which the Kung Fu master's motion captured performances are re-enacted. Six separate screens offer six different viewpoints set symmetrically in 60-degree steps around the performer. For each of these viewpoints an interactive control panel allows visitors to select from the six different styles of motion-graphic visualization.

The analytical and artistic formulations of *RE\_ACTOR: Interactive Kung Fu Analytics* constitute an apparatus for a new museology that both enables and stimulates the viewer's engagement with the embodied knowledge of Kung Fu. It offers a digital re-presentation of the Kung Fu master's performances that allows new knowledge to emerge in our enjoyment and appreciation of these living martial arts traditions. It is an operational and aesthetic strategy that sets out to overcome the relegation of vital cultural practices to a position of pastness that



重塑有形的文化遗产

艺术与设计实践通过不断地对自身进行重新定义，来回应变幻的社会文化语境。个体的身体需求一直是媒体艺术的焦点问题，自20世纪60年代以来，艺术家的身体演绎和观众的亲身参与开始结合成为一种新型的主体，并越来越沉浸于辩证法的调解经验中。今天，数字技术的全新机制使艺术品成为能够模拟现实和增加现实感的物品，观众不再是一个文物陵墓的消费者，而是一个视听资讯数据空间中的旅行者、发现者和创作者。

在观赏作品“极乐园（增强现实版）”（Pure Land AR）时，观众可以通过平板电脑的屏幕，探索莫高窟第220号窟内壮丽的佛教壁画，这座唐代早期洞穴坐落于中国甘肃省敦煌市莫高窟。敦煌研究院筹划了一个具有战略性的数字化项目，旨在记录和保存这个非常重要的遗址，他们制作的莫高窟第220号窟高分辨率照片和激光扫描模型已被用于“极乐园（增强现实版）”之中，以重塑敦煌非凡的佛教遗产。

我们搭建了一个与莫高窟第220号窟大小相同的简易方形房间，仅在方寸之间，就能虚拟呈现洞窟内的绘画和雕塑作品。观众拿着平板电脑在展厅中走动，便可深入探索莫高窟第220号窟，像是一趟动态发现之旅，重塑和创新了洞穴壁画的美妙神话。“极乐园（增强现实版）”这件作品，展示了虚拟呈现文化遗产的移动媒体和增强未来现实技术的发展方向。真实与虚拟之间的相互联结，为我们呈现了敦煌璀璨的佛教艺术宝藏，这件作品恰为这种联结提供了新的社会空间。“极乐园（增强现实版）”的交互和美学设计创造了一个经验连续体来联结真实的和虚拟的敦煌洞穴，并通过它们的相互联结和互补，实现知识传递，维持和增强其文化的正统性，同时保存它的原貌。

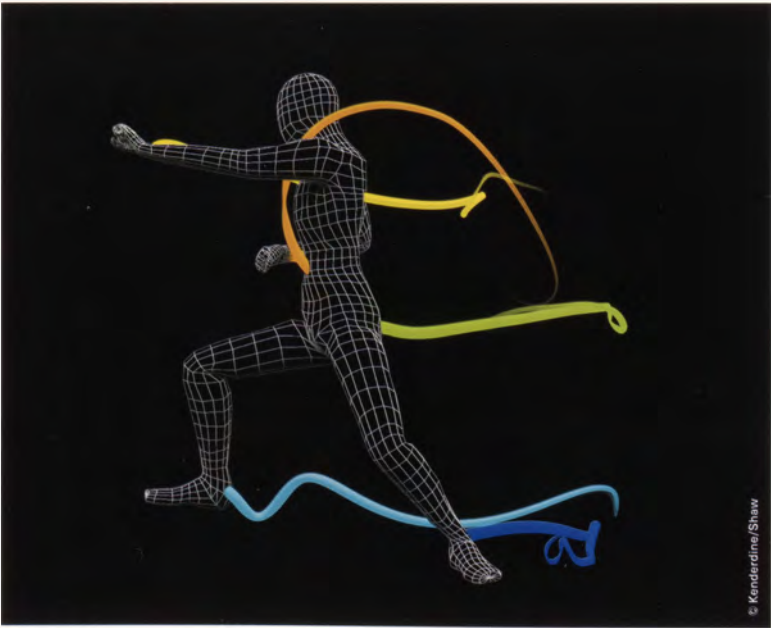
suspends the possibility of continued enculturation. By providing the circumstances in which motion capture data provides for embodied knowledge transmission, this interface can create a space in which digital strategies can help to sustain intangible heritage despite the theoretical difficulties associated with documenting the ephemeral, codifying the tacit, and mediating the embodied. The unique insights into the gestural and bodily aspects of Hakka Kung Fu styles provided by *RE\_ACTOR: Interactive Kung Fu Analytics* enacts a knowledge resource that addresses a broad public and current and future generations of practitioners.

RE-PRESENTING TANGIBLE CULTURAL HERITAGE

The practices of art continuously redefine themselves in response to changing socio-cultural contexts. The exigencies of the body have been a focal issue in media art since the 1960s where the artist's performative body and the spectators participatory body began to constitute a new type of body that was being increasingly immersed in the dialectics of mediated experience. Today the machineries of the new digital technologies induce the artwork to become a simulation and augmentation of reality where the viewer is no longer merely a consumer in a mausoleum of artefacts, but rather is a traveller, discoverer and creator in a dense new data space of audio-visual information. This entails a complex set of negotiations between body and space, between the actual domain of the real bodies of the viewers and the real spaces they inhabit, and the virtual domain of represented bodies and spaces.

*Pure Land AR* uses iPad tablets that visitors use as mobile viewing devices to explore the magnificent Buddhist wall paintings inside Cave 220, a cave dated to early Tang, from the Mogao Grottoes at Dunhuang in Gansu Province, China. The Dunhuang Academy has embarked on an ambitious digitization program to document and preserve this highly significant site, and their high-resolution photographs and laser-scanned models of Cave 220 have been used in *Pure Land AR* to reframe and reconstitute Dunhuang's extraordinary Buddhist heritage.

功夫动作可视化  
Kung Fu Visualization





“重演者” 功夫动作视觉化  
Kung Fu visualization of  
RE-ACTOR



## 总结和致谢

考古和遗产保护团体正在利用先进的数字影像技术来满足保护和保存的需求，而且这些技术也成为了文化记忆融合和群居生活至关重要的必要工具。“极乐园（增强现实版）”和“重演者：互动功夫分析论”赋予媒体艺术实践的机会，去打造与中国传统遗产进行交互式叙事的公众活动，从而催生出深刻的反思和文化历史意识。

“重演者：互动功夫分析论”是由中华国术总会 (International Guoshu Association) 和香港城市大学共同合作，香港康乐 (Hong Kong Leisure) 及文化事务署 (Cultural Services Department) 支持，为2016年展览“客家功夫三百年——文化遗产和未来的数字化视野” (300 Years of Hakka Kung Fu – Digital Vision of its Legacy and Future) 展览而创作。托拜厄斯·格雷姆勒的作品“客家功夫动态可视化”由策展人赵式庆、萨拉·肯德戴和邵志飞委托创作。香港武术生活档案馆是中华国术总会与香港城市大学之间的合作伙伴，这是香港首例使用最先进的数据采集工具归档和注解香港功夫风格和传统的数字化策略。“极乐园（增强现实版）”由邵志飞开发，由香港城市大学应用计算与互动媒体中心 (Applied Computing and Interactive Media, ACIM) 与敦煌研究院合作制作。

The paintings and sculptures of the cave are rendered virtually within the architecture of a simply constructed rectangular room that shares the same dimensions as those of Cave 220 itself. Walking around this room with the tablets, visitors can explore the interior of Cave 220 and make a kinesthetic journey of discovery that reformulates and refreshes the drama of these cave paintings. The *Pure Land AR* installation demonstrates the future of mobile media and augmented reality as a means of virtually embodying cultural heritage experiences. It creates a new social space for the conjunction of real and virtual formations that give transacted aesthetic expression to Dunhuang's Buddhist art treasury. *Pure Land AR*'s interactive and aesthetic design creates an experiential continuum between the real and virtual Dunhuang cave, and by making them contiguous and complimentary in this way a practice of knowledge transfer is enacted that maintains and amplifies its cultural probity while at the same time giving protection to the original.

## CONCLUSION AND ACKNOWLEDGEMENTS

Archaeological and heritage communities are rapidly expanding advanced digital imaging techniques for conservation and preservation needs, and these techniques have also become necessary tools integrated into cultural memory and vital to living communities of practice. The technologies and platforms developed in *Pure Land AR* and *RE\_ACTOR: Interactive Kung Fu Analytics* demonstrate new opportunities for media art practices to create interactive narrative public engagements with Chinese heritage materials that generate a rich re-imagining and consciousness of cultural histories.

*RE\_ACTOR: Interactive Kung Fu Analytics* was created for the 2016 exhibition '300 Years of Hakka Kung Fu – Digital Vision of its Legacy and Future' produced by the International Guoshu Foundation in conjunction with City University of Hong Kong, and supported by the Hong Kong Leisure and Cultural Services Department. Tobias Gremmler's *Hakka Kung Fu Motion Visualization* was commissioned for that exhibition by the curators Hing Chao, Sarah Kenderdine and Jeffrey Shaw. The Hong Kong Martial Arts Living Archive is a collaboration between the International Guoshu Association and City University of Hong Kong – the first-ever comprehensive digital strategy of archiving and annotating Hong Kong's Kung Fu styles and traditions using state-of-the-art data capture tools. *Pure Land AR* was developed by Kenderdine & Shaw and produced by the Center for Applied Computing and Interactive Media (ACIM) at City University of Hong Kong in partnership with the Dunhuang Academy.



设计互联是致力于呈现多元公共项目的新型文化综合平台，旨在激发设计作为社会发展的驱动力。设计互联主展馆开幕展“数字之维”将数字化设计作为融合科技革新与人文价值的平台，探索设计如何塑造我们的当下与未来。

与展览同期面世的《数字之维》一书，邀请国内外设计行业中的领军人物围绕相关议题展开讨论，力图以最具创造力的方式审视当下的数字化现象。

Design Society is a cultural platform that generates a diverse public programme, positioning design as a social catalyst. In view of the pervasive digitalization of today's world, Design Society opens its Main Gallery with 'Minding the Digital', an exhibition exploring how design shapes the present and the future, presenting digital design as a bridge to connect technology with core human values.

By inviting leading pioneers in design industry to reflect on such issues, this catalogue embraces digitalization as a creative force.

上架建议：数字设计、艺术展览

ISBN 978-7-5608-7485-2



9 787560 874852 >

定价：288.00 元