

SCIENCE MUSEUM

TIME, CULTURE AND IDENTITY: A DIGITAL EXCHANGE WORKSHOP

时间、文化与民族特 征：数字交流研讨会

SUMMARY REPORT
摘要报告

Workshop date: 9–10 October 2019

Venue: Institute for the History of Natural Sciences,
Chinese Academy of Sciences, Beijing

Organiser: Science Museum, with generous support
from the Chinese Academy of Sciences

研讨会日期: 2019年10月9日 – 10日

研讨会地点: 中国科学院自然科学史研究所

伦敦科学博物馆主办、中国科学院自然科学史研究所协办

SUMMARY REPORT

摘要报告

INTRODUCTION

The Science Museum hosted a two-day workshop, 'Time, Culture and Identity: A Digital Exchange', at the Institute for the History of Natural Sciences, Chinese Academy of Sciences, Beijing, on 9 and 10 October 2019. The workshop brought together 11 invited digital experts from Britain and China to share their practice and exchange in creative discussions. A key ambition of the workshop was to establish an international network of digital and creative cultural professionals and to facilitate future collaboration.

During the workshop, speakers were invited to give 20-minute presentations on digital projects, and to reflect on the challenges of digital interpretation of museum collections. Workshop participants also engaged in themed discussions and two collaborative creative sessions. The first creative session explored how we can use digital technologies to bring inanimate objects to life, reveal hidden things (what is inside, how it works, etc) and set objects in their historical and cultural context. The second creative session focused on the application of these ideas to a digital exhibit about the Country Scene automaton from the collections of the Palace Museum in Beijing.

Prior to the workshop, participants were generously hosted by the China Science and Technology Museum, and visited the *2019 Contemporary China International Digital Art Exhibition* hosted in Chao Centre for Art and Tech.

研讨会简介

科学博物馆在2019年10月9日、10日于北京中国科学院自然科学史研究所举办为期两天的“时间、文化与民族特征:数字交流研讨会”。该研讨会汇集了11位来自中国和英国的数字专家,分享他们的专业实践和交流创意构思。研讨会的雄心是建立一个数字和文化创意专业的国际网络,推进未来的合作。

参会者在研讨会中作20分钟关于数字项目的演讲,并针对博物馆藏品数字化演绎的课题提出反思。参会者也参与主题讨论和两场创意讨论。第一场创意讨论探索如何利用数字技术活化静态的展品,揭露展品隐藏的信息(例如内部有什么、怎么运作)以及将展品置入脉络中。第二场创意讨论着重在如何将以上构思运用于制作故宫博物院收藏的数字展品。

研讨会前夕,参会者访问了中国科技馆,并欣赏了朝艺术科技中心的2019当代中国国际数字艺术展。

TIME, CULTURE AND IDENTITY: THE CO-CREATION OF HISTORICAL RESEARCH AND CO-DEVELOPMENT OF VISITOR EXPERIENCE IN CHINA AND THE UK

时间、文化与民族特征：中英联合开展历史研究、共同提升访客体验研究项目

The workshop was part of the research project 'Time, Culture and Identity: The Co-Creation of Historical Research and Co-Development of Visitor Experience in China and the UK'. Uniting expertise and collections from China and the UK, the project has four core objectives:

1. Carry out and share archive research on the Palace Museum's collection of 18th-century clocks, watches and automatons.
2. Examine the ways in which British and Chinese museum visitors engage with historic collections.
3. Develop a co-designed digital resource which invites British and Chinese audiences to explore and learn about the Palace Museum's collection of 18th-century clocks, watches and automatons and the social, cultural and technological impacts they have had in China and Britain.
4. Explore methodologies and approaches and produce guidelines to support and enhance collaborations between academic, heritage and creative economy professionals in China and the UK.

此研讨会是“时间、文化与民族特征：中英联合开展历史研究、共同提升访客体验”研究项目的一部分。“时间、文化与民族特征”研究项目集结中英两国研究实力，涵盖四个主要内容：

1. 对故宫博物院收藏的18世纪英国钟表及自动机械进行全新原创性研究，以进一步了解藏品，并探讨其对中英两国社会、文化及技术所形成的影响。
2. 考察中英两国访客参观欣赏历史藏品在方式上有什么异同。
3. 合作开发设计数字资源，使中英访客能够探索和理解故宫博物院收藏的18世纪英国钟表及自动机械，以及它们对中英两国社会、文化及技术所形成的影响。
4. 探索方法与途径，并制定指导方针，以支持和加强中英两国学术、文物以及创意经济领域专业人员的协同与合作。

此项目为英国艺术与人文研究委员会/牛顿基金资助，由科学博物馆集团执行。故宫博物院是此国际合作项目的藏品伙伴。项目的学术伙伴包括中国科学院、北京交通大学。该项目于2018年12月1日启动，并于2020年4月30日结束，为期17个月。

研究团队：

藏品伙伴：故宫博物院

中国项目主要负责人：姚燕安，北京交通大学教授

英国项目主要负责人：提莉·布里斯，伦敦科学博物馆藏品部主任及首席策展人

中国项目副负责人：黄兴，中国科学院自然科学史研究所副教授

英国项目副负责人：马露琳，伦敦科学博物馆中国项目策展人

中英研究协调专员：钟珞筠，伦敦科学博物馆中英研究协调专员

The Science Museum was awarded a grant by the UK's Arts and Humanities Research Council (AHRC) and the Newton Fund to carry out this research project. The Palace Museum is the collections partner for this international collaborative research. Academic partners for this project include the Chinese Academy of Sciences and Beijing Jiaotong University. The project began on 1 December 2018 and will run for 15 months, concluding on 30 April 2020.

PROJECT TEAM

Collections partner: The Palace Museum

China Principal Investigator: Yao Yanan, Professor, Beijing Jiaotong University

UK Principal Investigator: Tilly Blyth, Head of Collections and Principal Curator, Science Museum

China Co-Investigator: Huang Xing, Associate Professor, Institute for the History of Natural Sciences, Chinese Academy of Sciences

UK Co-Investigator: Emma Stirling-Middleton, Project Curator: China, Science Museum

China-UK Research Facilitator: Carol Chung, China-UK Research Facilitator, Science Museum



Workshop presentation
研讨会报告



Workshop attendees visited the China Science and Technology Museum
参会者访问中国科技馆



Workshop attendees at the Institute for the Study of Natural Sciences
参会者在自然科学史研究所合照



Group discussion
小组讨论



Workshop attendees visited Chao Centre for Art and Technology
参会者访问朝艺术科技中心



Workshop attendees visited the China Science and Technology Museum
参会者访问中国科技馆



Pinup of ideas
展示想法



Creative workshop
创意讨论

WORKSHOP SCHEDULE 议程

WEDNESDAY 9 OCTOBER 2019

DAY 1

2019年10月9日 周三

第一天

| | |
|-------------|---|
| 09.00–09.30 | Registration/coffee 注册 |
| 09.30–10.00 | Welcome 欢迎 |
| 10.00–10.30 | Introduction 参会者介绍 |
| 10.30–11.00 | Introduction to Harmonic Kinetic Harmonic Kinetic工作室介绍 |
| 11.00–11.30 | Introduction to Moujiti 某集体交互设计工作室介绍 |
| 11.30–12.00 | Introduction to Clay Interactive Clay Interactive工作室介绍 |
| 12.00–12.30 | Group discussion: communication tools 讨论:沟通工具 |
| 12.30–14.30 | Lunch 午餐 |
| 14.30–15.00 | Introduction to E-Go 鱼果动画工作室介绍 |
| 15.00–15.30 | Introduction to ISO Design ISO Design工作室介绍 |
| 15.30–16.00 | Introduction to Signal Alpha Signal Alpha工作室介绍 |
| 16.00–16.15 | Tea break 茶叙 |
| 16.15–16.30 | Introduction to OUTPUT OUTPUT数字艺术平台介绍 |
| 16.30–17.00 | Introduction to Cogapp Cogapp工作室介绍 |
| 17.00–17.30 | Introduction to Blackbow 黑弓文化传播工作室介绍 |
| 18.00–20.00 | Dinner 晚餐 |

THURSDAY 10 OCTOBER 2019

DAY 2

2019年10月10日 周四

第二天

| | |
|-------------|---|
| 10.30–11.15 | Time, Culture and Identity: UK–China audiences, dynamic objects and digital interpretation 时间、文化与民族特征:中英观众、动态展品及数字演绎 |
| 11.15–12.00 | The Country Scene mechanism 乡村景色水法钟的机构 |
| 12.00–13.30 | Lunch 午餐 |
| 13.30–15.00 | Creative session 1: Using digital to interpret dynamic objects 创意讨论一:数字演绎动态展品 |
| 15.00–15.30 | Tea break 茶叙 |
| 15.30–17.00 | Creative session 2: Collaborative exercise 创意讨论二:合作演练 |
| 17.00–17.15 | Concluding remarks 研讨会总结 |

INTRODUCTION 简介

Dr Tilly Blyth outlined the aims of this workshop and highlighted that this was a starting point for UK–China creative businesses to work together to explore ways of interpreting historical collections. The ambition of the workshop was to explore creative ways of working and collaborating to develop unique and authentic audience experiences across the UK and China. She expressed gratitude to the attendees for coming such long distances for the workshop, to the Chinese Academy of Sciences Institute for the History of Natural Sciences for hosting the event, and to our funders, the AHRC and the Newton Fund, for enabling the workshop and the broader collaboration to happen. We were also grateful to colleagues from UK Research and Innovation in China, for supporting the organisation of the workshop.

提莉·布里斯博士阐明研讨会的目标，并点明本研讨会是中英创意产业合作探索历史藏品诠释方法的开端。本研讨会的雄心是思索如何用创意手段，为中英观众开发独特和原创的体验。她向每位远道而来的参会者、中国科学院自然科学史研究所为筹办研讨会所提供的协助，以及英国艺术与人文研究理事会和牛顿基金会所提供的资金等促成本研讨会及合作交流的支持表达无限感激。我们也感谢英国研究创新署中国办公室的同事们协助组织研讨会。

SUMMARY OF PRESENTATIONS 演讲摘要

WORKSHOP DAY 1: 9 OCTOBER 2019

研讨会第一天：2019年10月9日

PRESENTATION 1.1 Introduction to Harmonic Kinetic

Dominic ROBSON, Director of Harmonic Kinetic, Lecturer at Goldsmiths, University of London

Mr Robson introduced Harmonic Kinetic – a design studio that works with people, media and interactive technologies to create innovative environments for museums and other public spaces. The studio takes a collaborative and experience-led design approach, and works with a wide range of material, from sound and moving image to kinetics and video games. Mr Robson presented a selection of collaborative projects with the Science Museum and the Pompidou Centre. He highlighted that a change in the attention economy and the lack of research into the consumption of digital exhibits are the main challenges for digital interpretation in museums.

报告1.1 Harmonic Kinetic 工作室介绍

多明尼克·罗伯森, Harmonic Kinetic总监、伦敦金匠学院讲师

多明尼克介绍了Harmonic Kinetic设计工作室,他的工作室运用人,媒体和互动技术为博物馆和其他公共场所创造创新的环境。工作室采用协作式和体验式的设计方法,使用广泛的材料,包括声音和运动图像到动力学和视频游戏。多明尼克报告了和伦敦科学博物馆和法国庞毕度中心合作的项目。他认为观众注意力的改变以及数字展品消费方面研究的欠缺是博物馆运用数字技术诠释藏品的最大挑战。

PRESENTATION 1.2 Introduction to Moujiti

FEI Jun, Founder of Moujiti, Professor at Central Academy of Fine Arts

Professor Fei introduced Moujiti – an award-winning interactive experience design powerhouse founded in 2013. Moujiti takes a user-centred design approach and works across media and digital platforms. It specialises in planning the most intuitive digital and interactive mechanisms for users and businesses in areas such as smart museums, community cultural programmes and digital publishing. Professor Fei presented stunning and beautiful work through case studies such as the City as Museum project, which draws from the collective cultural memories of the city of Beijing by connecting oral history with AR and VR technology.

报告1.2 某集体交互媒体工作室介绍

费俊,某集体交互媒体负责人、中央美术学院设计学院教授

费教授介绍某集体工作室,该工作室创立于2013年并获得交互体验设计奖项。某集体工作室采用以人为本的设计理念,整合媒体和数字平台。某集体工作室专精于为使用者和企业规划和制作直觉式的数字和交互体验,应用领域包含智慧博物馆、社区文化项目、数字出版。费教授的报告列举卓越案例,例如城市博物馆项目,该项目透过虚拟现实和增强现实技术联结口述历史探索北京市的集体文化记忆。

WORKSHOP DAY 1: 9 OCTOBER 2019

研讨会第一天：2019年10月9日

PRESENTATION 1.3 Introduction to Clay Interactive

Anthony PEARSON, Founder/Director of Clay Interactive

Mr Pearson introduced Clay Interactive – a London-based design studio that creates digital exhibits for the UK's leading museums and cultural institutions. He presented case studies of designing digital exhibits and linear media for *Science City* at the Science Museum, *Nelson Mandela: The Official Exhibition* and the *Endeavour* galleries at the National Maritime Museum. Now that museum visitors have shorter attention spans and higher expectations, Mr Pearson suggested that digital presentation in museums should be intuitive and provide visitors with a unique experience of engaging with museum objects.

报告1.3 Clay工作室介绍

安东尼·皮尔森,Clay工作室负责人

安东尼介绍Clay工作室,该设计工作室位于伦敦、专为英国领先的博物馆和文化机构制作数字展品。安东尼的报告列举他的工作室为伦敦科学博物馆科学城展览,以及在国家海事博物馆纳尔逊·曼德拉:官方展览和奋进画廊所设计的数字展品和线性媒体等案例。既然博物馆参观者的注意力跨度较短,期望值更高,安东尼建议博物馆中的数字展示应具直观性,并为参观者提供与博物馆物品互动的独特体验。

PRESENTATION 1.4 Introduction to E-Go

WANG Zhigang, Founder of E-Go, Associate Professor at Tsinghua University

Professor Wang introduced E-Go – a digital design company founded in 2008, specialising in designing holographic projection, in-transit imaging, augmented reality, multimedia stage design, special effects for movies and 3D animation. Professor Wang presented a detailed case study of the Zhaolong Hotel project, in which new-media art and performance design were used to renovate the hotel, creating a new brand and an immersive space that promotes healthy lifestyles for its visitors.

报告1.4 鱼果动画工作室

王之纲,鱼果动画工作室负责人、清华大学副教授

王教授介绍了鱼果工作室,该工作室成立于2008年,专门设计全息投影、随境影像、增强现实、多媒体舞台设计、电影特效和3D动画。王教授介绍了兆龙酒店项目的详细案例,该项目利用新媒体艺术和表演设计对酒店进行翻新,创造了新品牌和沉浸式空间,为游客营造健康的生活方式。

WORKSHOP DAY 1: 9 OCTOBER 2019

研讨会第一天：2019年10月9日

PRESENTATION 1.5 Introduction to ISO Design

Damien SMITH, Founder/Creative Partner of ISO Design

Mr Smith introduced ISO – a design studio that develops large-scale immersive media and interactive experiences for cultural, educational and brand partners internationally. He presented case studies such as the *Design Me* interactive installation for the V&A gallery at Design Society in Shekou and the *Gallery of Lost Art* (Tate's first ever online-only exhibition), which won an SXSW Interactive Innovation Award. Mr Smith pointed out that the challenge for digital design companies is the need for room for experimental work with artists and industry partners.

报告1.5 ISO设计工作室

达米安·史密斯, ISO设计工作室合伙人兼创意总监

达米安介绍了ISO设计工作室,该工作室为国际文化,教育和品牌合作伙伴开发大型沉浸式媒体和互动体验。达米安的报告列举许多案例,包含深圳蛇口V&A设计画廊的Design Me交互式装置,以及泰特美术馆首次在网上举办的展览—失落的艺术画廊,该展获得了SXSW交互式奖。达米安指出,数字设计公司面临的挑战是需要与艺术家和行业合作伙伴进行实验性工作的空间。

PRESENTATION 1.6 Introduction to Signal Alpha

Charlie ZHANG, Founder of Signal Alpha

Mr Zhang introduced Signal Alpha – an innovative full-service installation design studio based in Shanghai and founded in 2017. Signal Alpha's practice involves creating interactive spaces, narrative interactions, interactive architecture and kinetic sculpture. Mr Zhang presented case studies such as the *Temple of Canal* project, a multimedia exhibit exploring the Grand Canal as a cultural symbol. He addressed the challenge of planning and managing visitor engagement with interactive exhibits, for example how to control sound triggered by visitors' movements in a way that does not interfere with visitor flow.

报告1.6 Signal Alpha工作室介绍

张林, Signal Alpha工作室负责人

张林介绍了Signal Alpha工作室,该工作室成立于2017年,总部位于上海,提供全方位服务的创新装置设计。Signal Alpha的业务涉及创建互动空间、叙事互动、互动建筑和动感雕塑。他介绍了几个案例,包括运河圣殿项目,该项目透过多媒体展项探讨大运河作为一种文化象征。张林提出,设计互动展示的挑战在于如何规划和管理访客与互动展品的互动,例如如何以不干扰访客流量的方式控制访客移动触发的声音。

WORKSHOP DAY 1: 9 OCTOBER 2019

研讨会第一天：2019年10月9日

PRESENTATION 1.7 Introduction to OUTPUT

LIU Yinmeng, Founder and CEO of OUTPUT

Ms Liu introduced OUTPUT – an innovative digital art platform working with cutting-edge digital artists around the world to explore the multiple forms of digital art, and to connect art, technology and other creative industries to bring people a multidimensional experience. She presented projects, including the co-creation of an immersive exhibition celebrating the Lunar New Year of 2019 at the Palace Museum, which showcased the richness of the museum's collection. Introducing the Output Children's Museum project, Ms Liu highlighted that the marriage of art and technology can be useful for education.

报告1.7 OUTPUT数字艺术平台介绍

刘茵梦, OUTPUT数字艺术平台负责人、首席执行官

刘女士介绍了OUTPUT,该公司是一个创新的数字艺术平台,它与世界各地的顶尖数字艺术家合作,探索多种形式的数字艺术,并将艺术、技术和其他创意产业联系起来,为人们带来多维体验。刘女士介绍一些项目,其中包括在故宫博物院举办、庆祝2019年农历新年的沉浸式展览的联合创作,该创作展现博物馆藏品的丰富性。在介绍OUTPUT儿童博物馆项目时,刘女士强调艺术与技术的结合有助于教育推广。

PRESENTATION 1.8 Introduction to Cogapp

Gavin MALLORY, Production Director of Cogapp

Mr Mallory introduced Cogapp – an award-winning digital agency that works with international clients including MoMA, the British Museum, Tate and the Metropolitan Museum of Art. He presented case studies, such as the Arabian Gulf Digital Archive project, in which he addressed the importance of designing a user experience through initiating participatory workshops and thorough research. Mr Mallory highlighted the challenge of creating meaningful digital experiences with museum objects. He suggested that considering the creator's original intention and designing a 'slow looking' experience for the visitor could be a solution.

报告1.8 Cogapp数字公司介绍

盖文·麦勒里, Cogapp制作总监

盖文介绍了屡获殊荣的数字公司Cogapp,该公司与许多国际客户合作,包括纽约现代美术馆、大英博物馆、泰特美术馆和大都会艺术博物馆。盖文介绍了一些案例,例如阿拉伯海湾数字档案馆项目,在此案例中他强调参与式工作坊和深入研究对设计用户体验的重要性。盖文提到用博物馆藏品创造有意义的数字体验的挑战,他认为在设计数字体验时应考虑创作者的初衷,并提议设计放慢速度的观看体验作为一种解决方案。

WORKSHOP DAY 1: 9 OCTOBER 2019

研讨会第一天：2019年10月9日

PRESENTATION 1.9

Introduction to Blackbow

YU Bo, Director of Brand of Blackbow

Ms Yu introduced Blackbow – a new-media company founded in 2010 committed to creating cultural experiences and cultural memories for the public with cutting-edge art and technological innovation. She presented a selection of cross-media projects, such as the Ambilight show designed for China's National Day evening gala in 2019, the Design Tour Project – *Dear Garbage* – for 2019 Beijing Design Week, and a projection mapping show featuring the Chinese New Year at the Guimet Museum in Paris. Ms Yu noted that digital technology can be used to bridge the gap between the consumption of popular culture and cultural heritage.

报告1.9

黑弓文化传播公司介绍

于博, 黑弓品牌总监

于女士介绍了黑弓, 该新媒体公司成立于2010年, 致力于通过尖端的艺术和技术创新为公众创造文化体验和文化记忆。她介绍了一些跨媒体项目, 例如在2019年为中国国庆晚会设计的流光溢彩节目, 在2019年北京设计周举办的设计之旅项目—“亲爱的垃圾”, 以及在法国巴黎的吉美博物馆以中国新年为主题的楼面投影节目。于女士指出, 数字技术可用于弥合流行文化消费与文化遗产消费之间的差距。

SUMMARY OF THEMED DISCUSSION

主题讨论摘要

Participants engaged in a 30-minute facilitated discussion on how teams communicate with each other and how they manage collaborative projects. They explored what tools were used to facilitate communication and for project management. Communication tools mentioned by participants from the UK included having stand-up meetings, using Google Docs and Dropbox for project file sharing and management, and using 'pin-ups' (Post-it Notes on a pinboard) for collaborative mind-mapping and for developing project ideas. Chinese participants mentioned using WeChat (a messaging app with built-in functions such as forming group chats, video/audio calling, file sharing, etc) and Teambition and Dingtalk (collaboration platforms for team communication and teamwork) for communication, and using Shimo (a cloud-based document sharing and editing platform) for sharing and managing project files.

In terms of managing collaborative projects, participants from the UK mentioned using Slack and Basecamp – both are collaboration platforms for projects – while WeChat was prioritised as a key project management tool for Chinese participants. Shotgun and Trello (production tracking and workflow management software) were also mentioned by participants as useful tools to manage projects in the pipeline.

参会者参与了30分钟的主题讨论, 讨论内容是团队之间如何沟通以及如何管理协作项目。参会者分享了彼此使用哪些工具来促进沟通和项目管理。来自英国的参会者提到的交流工具包括站立会议、使用Google Docs和Dropbox进行项目文件共享和管理, 以及使用Pinups (利用固定在白板上的便笺) 进行协作思维导图和发展项目构想。中国参会者提到使用微信 (信息传递应用程序, 内置功能包括形成群聊, 视频/音频通话, 文件共享等)、Teambition (用于团队沟通和团队合作的团队协作平台) 和Dingtalk (用于团队沟通和协作的协作平台) 来进行团队合作沟通, 并使用Shimo (云端文档共享和编辑平台) 来共享和管理项目文件。

在管理协作项目方面, 英国的参会者提到使用Slack和Basecamp, 两者皆是项目的协作平台, 而微信则是中国参与者优先考虑的关键项目管理工具。参会者也提到Shotgun和Trello (生产跟踪和工作流管理软件), 两者皆是管理项目的有效工具。

WORKSHOP DAY 2: 10 OCTOBER 2019

研讨会第二天:2019年10月10日

PRESENTATION 2.1

Time, Culture and Identity: UK–China audiences, dynamic objects and digital interpretation

Emma Stirling-Middleton, China Project Curator, Science Museum

As co-investigator on the 'Time, Culture and Identity' research project, Ms Stirling-Middleton provided an overview of key achievements of the project, including audience research, cross-cultural historical archive research, and study of the Country Scene automaton's mechanism. The audience research examined the ways in which British and Chinese museum visitors engage with the Palace Museum's horological collections in three locations: Beijing, Hong Kong and London. The historical archive research illuminated the trading relationships between the UK and China, and the reception of mechanical clocks in China. The mechanism study revealed the inner workings of the Country Scene automaton.

报告2.1

时间、文化与民族特征:中英观众、动态藏品与数字诠释

马露琳,伦敦科学博物馆中国项目策展人

作为时间、文化与民族特征项目的副负责人,马露琳概述了该项目的主要成就,包括观众调研、跨文化历史档案研究以及对乡村景色水法自动机的机制的研究。观众调研调查了英国和中国博物馆访客如何与北京、香港和伦敦三个地方的钟表藏品互动。历史档案研究阐明了中英之间的贸易关系,以及中国对机械钟的接受情况。机制研究揭示了乡村景色水法自动机的内部机械原理。

PRESENTATION 2.2

The Country Scene mechanism

Li Yezhuo, Postdoctoral Researcher at Beijing Jiaotong University

Dr Li presented the mechanism of the Country Scene clock. Through observation of the clock mechanism and careful analysis of a China Central Television documentary about the conservation of clocks (我在故宫修文物), Dr Li provided a breakdown of the inside mechanism into power source, composition of energy transmission, and six transmission routes. Through the use of SolidWorks model-building software, Dr Li and his team were able to develop a 3D model simulating the motion of the mechanism of the Country Scene clock. With the interpretation of the 3D model the audience were able to understand the mechanism of each part of the clock, for example the rotation of glass pillars (simulating water flow) and rotation of animals, such as chickens and geese.

报告2.2

乡村景色水法自动机的机制研究

李晔卓,北京交通大学博士后研究员

李博士介绍了乡村景色水法钟的机制。通过观察时钟机制并仔细分析央视纪录片—我在故宫修文物内有关时钟修复的纪录,李博士将内部机制分解为电源、能量传输的组成和六种传输路径。通过使用SolidWorks(模型构建软件),李博士和他的团队开发出一个模拟乡村景色水法钟机制运动的3D模型。借助3D模型的解释,观众将能够了解时钟的每个部分的机制,例如玻璃柱的旋转(模拟水流)和动物(例如鸡和鹅)的旋转。

SUMMARY OF CREATIVE SESSIONS

创意讨论摘要

On day 2 workshop participants engaged in two 90-minute chaired group discussions. The first creative session explored how we can use digital technologies to bring inanimate objects to life, reveal hidden mechanisms (what is inside, how it works, etc) and set objects in their historical and cultural context. The second creative session focused on the application of these ideas to a digital exhibit about the Country Scene automaton.

Key themes relating to the content of the digital exhibit included:

- The different concepts of time in 1700s China and Britain
- A simple breakdown of key parts of the automaton's mechanism
- The reception of the Country Scene and other British automatons in China

Key themes relating to the approaches to delivery included:

- Allowing visitors to 'shrink' themselves and explore the interior of the automaton as if it were a room
- Using animal automatons or puppetry as media for storytelling
- The slow reveal or exploration of the automaton through the use of a torch, X-ray or scan experience
- Tactile objects that reveal the working or mechanism through touch
- Interpreting through the clockmaker (Q&A, person-to-person engagement)
- Using sound to evoke history and culture (eg the sound of the chicken for defining time)

研讨会第二天,参会者参加了两场90分钟、由主持人带领的小组讨论。第一场创意讨论探索如何利用数字技术活化静态展品,揭露展品隐藏的信息(例如内部有什么、怎么运作),以及将展品置入脉络中。第二场创意讨论着重在如何将以上想法运用于制作乡村景色水法自动机的数字展品。

关于数字展品内容的关键想法包括:

- 18世纪中英两国不同的时间观
- 乡村景色水法自动机关键机制的解释
- 乡村景色水法自动机以及其他英制自动机在中国的反响

关于数字展品制作手段的关键想法包括:

- 允许观众将自己缩小,像是进入房间一般地探索自动机内部
- 利用动物自动机作为说故事的媒介
- 慢速揭露或是利用手电筒、X光片扫描式探索自动机
- 利用可触碰的展项解释钟表内部机制的运作
- 运用询问制钟匠的方式诠释藏品(问答、面对面互动)
- 用声音来引导历史与文化的解释(例如鸡鸣)

SUMMARY OF WORKSHOP

研讨会总结性摘要

This two-day workshop was concluded with the following reflections on the challenges and opportunities brought by digital interpretation.

Challenges:

- The change in the attention economy – smartphones consuming visitor attention is a challenge for museums
- Research and innovation – budgets and time do not allow us to play around with ideas
- Collections – how do we work with objects to create meaningful digital experiences?
- Cultural block – how do we create links between popular culture and cultural heritage to engage visitors in their scientific and technological heritage?

Opportunities:

- Space and movement – with digital technology we can re-create physical space in the virtual world to respond to the rapidly changing urban landscapes in China and the UK
- Location and meaning – digital technology can play a role in connecting places, memory and people
- Authenticity and the 'real' – the importance of the real can be challenged; we may ask 'what is a "real" object?' if objects can be digitally re-created, but does that give historical objects more cultural value?
- Imagination and magic – digital interpretation can create experiences that do not just provide learning but bring awe and enchantment into the world

为期两天的研讨会圆满结束,我们认为以下几点阐述数字技术诠释藏品上的挑战和机遇可以作为研讨会的总结:

挑战:

- 游客注意力的变化:吸引游客注意力的智能手机将是博物馆的挑战
- 研究与创新:预算和时间限制不利于玩转想法
- 博物馆藏品:我们如何运用藏品创造有意义的数字体验?
- 文化障碍:我们如何在流行文化和文化遗产之间建立联系,拉近游客与科技遗产的距离?

机遇:

- 空间与移动:我们可以借助数字技术在虚拟世界中重建物理空间,以应对中国和英国迅速变化的城市景观
- 地方与意义:数字技术可以在联系地方、记忆和人的过程中发挥作用
- 真实性和真实物件:真实性的重要性可能会受到挑战。如果我们可以用数字技术再现物件,我们可能会问究竟什么是“真实”物件?数字再现是否赋予历史物件更多的文化价值?
- 想象力和魔力:数字诠释不仅可以创造经验,而且可以为世界带来敬畏和魅力

BIOGRAPHIES OF WORKSHOP PARTICIPANTS 参会者简介

TILLY BLYTH
提莉.布里斯



Dr Tilly Blyth is the Head of Collections and Principal Curator at the Science Museum in London, where she is responsible for the Curatorial, Research, and Library and Archives departments. She is a principal investigator for the AHRC-funded project 'Time, Culture and Identity'. Her team have delivered award-winning galleries and exhibitions at the Science Museum such as *Mathematics* and *Illuminating India*. Tilly was lead curator of the *Information Age* gallery, which explores 200 years of information and communication networks and how they have transformed the world.

Tilly studied physics at the University of Manchester before migrating towards the social sciences, with an MSc in science policy and a PhD in the history and sociology of technology. Her particular research interests are in the history of computing, and women's roles in the development of the computing industry.

She is co-presenter and curator of the landmark BBC Radio 4 project *The Art of Innovation*, which looks at the relationship between artists and scientists across a radio series, book and exhibition. She is a member of BAFTA and a trustee of the Raspberry Pi Foundation.

提莉是伦敦科学博物馆典藏部领导与主要策展人，负责管理科学博物馆的策展、研究、图书与档案馆等部门。她是英国艺术与人文研究委员会资助的“时间、文化与民族特征：中英联合开展历史研究、共同提升访客体验”研究项目的主负责人。她的团队曾制作获奖的展览，包括“数学”展和“点亮印度”展。提莉也是“信息时代”展的主策展人，该展览讨论了两百年来信息与沟通的网络是如何引领世界的转变。

提莉曾在曼彻斯特大学攻读物理学，她的研究转向社会科学，并取得科学政策硕士和科技社会史博士。她的研究兴趣包含计算机史、女性在计算机产业发展的角色。

提莉负责主持和策划和英国广播公司第四电台合作的项目—“艺术的创新”，该项目透过电台节目、专书和展览探讨艺术家与科学家的关系。她同时也是英国电影学会的成员、树莓派基金会的理事。

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CAROL CHUNG
钟珞筠



Carol Chung works as a UK–China Research Facilitator for the AHRC-funded project 'Time, Culture and Identity', based at the Science Museum, London. She received her PhD in museum studies from University College London, specialising in museum education and audience research. Carol has completed postdoctoral research at the University of Bath, studying the perception of Scotland among Chinese audiences visiting the *Romantic Scotland: Castles, Land and Sea* exhibition. She has worked as project officer on a Commonwealth Blue Charter research project at the Association of Commonwealth Universities, and as an evaluation officer for a Somalian exhibition at the British Museum.

钟珞筠现任职伦敦科学博物馆，担任英国艺术与人文研究委员会资助的“时间、文化与民族特征：中英联合开展历史研究、共同提升访客体验”研究项目的中英研究协调员。她取得伦敦大学学院博物馆学博士，专业为博物馆教育、观众研究。曾任职巴斯大学博士后研究员，负责“浪漫苏格兰展览：论中国观众对苏格兰的文化认知”研究项目；大英国协大学协会项目专员，负责“大英国协蓝色宪章”研究项目；大英博物馆观众研究调查员，负责索马利亚文化展览观众调研。

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FEI JUN
费俊



Fei Jun holds an MFA in electronic integrated art from Alfred University's School of Art and Design in New York. He is a professor in the art and technology programme at Central Academy of Fine Art, a chief creative director of Moujiti interactive design studio and a curator of Beijing Media Art Biennale. As an artist, designer and educator, he devotes himself to the research, education and practice of art and technology. His artistic practice explores the hybrid space constructed by virtual and physical space. His art and design work has been exhibited nationally and internationally in galleries, museums and festivals, including the Venice Biennale, and has received many international awards including an iF Design Award, Red Dot Design Award and Design for Asia Award.

费俊毕业于美国阿尔弗雷德大学电子综合艺术专业并获得硕士学位。现任中央美术学院设计学院艺术+科技方向教授、某集体交互媒体首席创意总监、北京媒体艺术双年展策展人。他以艺术家、设计师和教育者的多重身份从事艺术与科技研究、教育与实践，他的艺术实践主要关注由虚拟和实体空间的共同构建的混合空间。他的艺术及设计作品曾在威尼斯双年展等国际展览和艺术节中展出，并荣获了德国iF设计奖、红点设计奖和亚洲最具影响力设计大奖等荣誉。

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HUANG XING
黄兴



Dr Huang Xing is an Associate Researcher at the Institute for the History of Natural Sciences, Chinese Academy of Sciences. He is a co-investigator for the AHRC-funded project 'Time, Culture and Identity', and has researched as a visiting scholar in the UK at the Needham Research Institute, Cambridge University, and in Germany at the Max Planck Institute for the History of Science.

His research focuses on the history of ancient metallurgy, compasses and mechanisms, and simulation of the history of technology. He has published two monographs, 'An Empirical Study of Ancient Chinese Compasses' and 'A Study of Metallurgy', and published dozens of papers in *Journal of Archaeological Science*, *Studies in the Histories of Natural Sciences*, *Journal of Dialectics of Nature* and *Agricultural History of China*.

黄兴是中国科学院自然科学史研究所副研究员。黄博士是英国艺术与人文研究委员会资助的“时间、文化与民族特征：中英联合开展历史研究、共同提升访客体验”研究项目的副负责人。他曾任英国剑桥李约瑟研究所、德国马普学会科技史研究所访问学者。他从事古代冶金史、指南针史、机械史、技术史模拟与仿真等研究；著有《中国古代指南针实证研究》《炼铁记》等，在 *Journal of Archaeological Science*、《自然科学史研究》、《自然辩证法通讯》、《中国农史》等刊物发表学术论文十余篇。

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LI YEZHUO
李晔卓



Li Yezhuo is a member of the postdoctoral teaching staff at Beijing Jiaotong University. He completed an undergraduate degree in horological instruments at Harbin Institute of Technology, and is currently researching reconfigurable ground mobile systems with multiple locomotion modes, and their mechanism design. He has participated in co-developed projects at the Creative Machine Design Laboratory, Department of Mechanical Engineering, Cheng Kung University (Taiwan), published seven papers in EI/SCI journals and has been awarded 19 patents for invention.

李晔卓是北京交通大学师资博士后，本科毕业于哈尔滨工业大学，计时仪器专业。李博士目前主要从事可变形多模式地面移动系统与机构创新设计的相关研究，曾赴台湾台南成功大学，机械工程学系，创意性机器设计教研室联合培养。他已发表相关EI/SCI学术论文7篇，申请获得发明专利19项。

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CHARLIE LIU
刘蕊



Charlie Liu is a brand representative and senior planner at Blackbow. She has participated in the planning and execution of a number of new-media performing arts projects such as *Dream2 Paradise*, a new-media art installation; *The Worlds of Splendors*, an immersive digital painting exhibition; *Dream of the Lanre*, a super-immersive play based on NetEase's mobile game *A Chinese Ghost Story*; and *36kr Error MxD Future City*, an exhibition about future city life. Charlie has taken part in the creative planning and dissemination of online and offline brands such as Tencent, Baidu, iQiyi and China Central Television Variety. She is good at combining artistic and cultural ideas with new-media art and seeking the best solution for digital art creativity in cultural communication.

刘蕊现任黑弓品牌代表、资深策划人。参与策划与执行多个新媒体演艺项目如：《幻境未来》新媒体梦境乐园、《瑰丽·犹在境》古画数字艺术展、网易倩女幽魂超感沉浸剧《梦回兰若》、36kr《没想到未来城》等。曾服务腾讯、百度、爱奇艺、央视综艺等品牌线上线下的创意策划与传播，善于将艺术和文化创想与新媒体艺术相结合，寻求数字艺术创意在文化传播中的最优解决方案。

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LIU YINMENG
刘茵梦



Liu Yinmeng is the founder and CEO of digital art platform OUTPUT. Since graduating from the Arts Management department at Boston University, she has worked in the contemporary art scene in New York. OUTPUT has signed hundreds of top digital artists across the globe, forming an innovative platform dedicated to art and technology, and thus empowering experience related to arts and culture, education, technology and retail. OUTPUT has also initiated the first digital art summit in China, and committed to further developing the potential of the industry and to nurturing a central hub for global dialogues on digital art in China.

刘茵梦是OUTPUT数字艺术平台的创始人兼首席执行官。她毕业于波士顿大学艺术管理系，多年来在纽约当代艺术领域颇有见地。OUTPUT已与全球数百名顶级数字艺术家签约，形成了致力于艺术和技术的创新平台，从而增强了与艺术和文化，教育，技术和零售相关的经验。OUTPUT曾在中国发起首届数字艺术峰会，致力积极开发该行业的更多潜力，并为在中国培育数字艺术成为全球对话中心。

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GAVIN MALLORY
盖文·麦勒里



Gavin Mallory is Production Director at the award-winning digital agency Cogapp, where he has worked since 2006 and is now a partner in the business. He has worked with clients including MoMA, the British Museum, Tate and the Metropolitan Museum of Art.

Gavin specialises in user experience, workshop facilitation and project management. He has spoken at international museum conferences, as well as co-curating and hosting MCNx London on behalf of the Museum Computer Network.

盖文·麦勒里是屡获殊荣的数字公司Cogapp的制作总监，他从2006年开始在该公司工作，现在是该业务的合伙人。他曾与纽约现代美术馆、大英博物馆、泰特美术馆和大都会艺术博物馆等客户合作。

盖文擅长于用户体验、研讨会主持和项目管理。他曾在国际博物馆会议上发言，并代表博物馆计算机网络共同策划和主办了伦敦博物馆计算机网络大会 (MCNx London)。

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DAVE PATTEN
戴威·派顿



Dave Patten is Head of New Media at the Science Museum, where he manages the team that develops and commissions digital exhibits for the museum. He has a background in electronics and computer science and has worked at the museum for over 30 years, developing exhibitions and leading development teams. Recent work includes *Web Lab*, the multi-award-winning collaboration with Google; *Engineer Your Future*, an interactive exhibition for teenagers on engineering; and a secondment to Frost Science in Miami to help develop exhibitions and systems for a new museum which opened in 2017. Dave runs the Science Museum Group's Digital Lab initiative, which experiments in emerging technologies and visitor experiences (<https://lab.sciencemuseum.org.uk>).

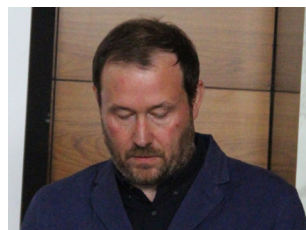
Dave is a frequent speaker at international conferences and workshops.

戴威是伦敦科学博物馆新媒体部主任，他管理为博物馆开发和委托数字展品的团队。他具有电子和计算机科学方面的背景，并且在科学博物馆工作了30多年，致力于开展展览和领导开发团队。他最近的工作项目包括与谷歌合作、屡获殊荣的“网络实验室”，“打造你的未来”- 一个面向青少年的工程互动展览，他并借调到美国迈阿密佛罗里达科学馆，协助开发于2017年开放的新博物馆的展览和系统。戴威负责运营科学博物馆集团的数字实验室，该项目将对新兴技术和参观者体验进行实验 (<https://lab.sciencemuseum.org.uk>)。

戴威经常在国际会议和研讨会上演讲。

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ANTHONY PEARSON
安东尼·皮尔森



Anthony Pearson is Creative Director and co-owner at Clay Interactive, a London-based design studio that creates digital exhibits for the UK's leading museums and cultural institutions.

With over 20 years of industry-specific experience, Anthony is interested in where the digital and physical overlap, and how advances in technology can provide new experiences and methods of engagement.

Recently he oversaw the design of digital exhibits and linear media for *Science City* at the Science Museum, *Nelson Mandela: The Official Exhibition* and the *Endeavour* galleries at the National Maritime Museum.

Clay is currently developing projects for the British Museum, British Library, Science Museum, Hampton Court Palace, Battersea Dogs & Cats Home and the Museum of the Home (previously the Geffrye Museum).

安东尼·皮尔森是伦敦Clay Interactive设计工作室的创意总监兼共同所有人，该工作室为英国领先的博物馆和文化机构创建数字展品。

安东尼拥有20多年的行业经验，他对数字和物理重叠以及如何用先进技术提供新的参与体验和参与方法感兴趣。

他最近负责监督科学博物馆“科学城”展览，以及国家海事博物馆监督“尼尔森·曼德拉：官方展览和奋进画廊”的数字展品和线性媒体设计。

Clay工作室目前正在为大英博物馆、大英图书馆、科学博物馆、汉普顿宫、巴特西流浪狗收容所和杰弗里博物馆开发项目。

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DOMINIC ROBSON
多明尼克·罗伯森



Dominic Robson is a London-based designer with a background in interaction design, media production and creative engineering.

His studio, Harmonic Kinetic, works with people, media and interactive technologies to create innovative environments for museums and other public spaces. The studio takes a collaborative and experience-led design approach. It works with a wide range of material, from sound and moving image to kinetics and video games, to develop exciting new possibilities that bring interaction, interpretation, storytelling and animation to objects and physical spaces.

Dominic also teaches extensively in design, currently at Goldsmiths, University of London and the HEAD school (Haute École d'Art et de Design) in Geneva.

多明尼克·罗伯森是一位伦敦设计师，具有交互设计、媒体制作和创意工程的背景。

他的工作室Harmonic Kinetic运用人、媒体和互动技术为博物馆和其他公共场所创造创新的环境。该工作室采用协作式和体验式的设计方法，使用各种材料，从声音和运动图像到动力学和视频游戏，来开发令人兴奋的新可能性，从而将互动、解释、故事和动画引入展品和物理空间。

多明尼克还广泛地教授设计方面的知识，他目前在伦敦金匠学院和日内瓦的高等艺术设计学院任教。

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DAMIEN SMITH
达米安·史密斯



Damien Smith is a partner and Head of Creative Strategy at UK design and research studio ISO.

ISO develops large-scale immersive media and interactive experiences for cultural, educational and brand partners internationally. It is currently developing projects in New York, Chicago, Glasgow, London, Kuwait City, Muscat, Dubai and Moscow. Commercial partners have included Mercedes Benz, JCB, IKEA, Ballantine's and Warner DC.

ISO developed the *Design Me* interactive installation for the V&A gallery at Design Society in Shekou and won an SXSW Interactive Innovation Award for the *Gallery of Lost Art* – Tate's first ever online-only exhibition.

达米安·史密斯是英国设计与研究工作室ISO的合伙人兼创意策略总监。

ISO为国际文化、教育和品牌合作伙伴开发大型沉浸式媒体和互动体验。他们目前正在纽约、芝加哥、格拉斯哥、伦敦、科威特城、马斯喀特、迪拜和莫斯科开发项目。商业合作伙伴包括梅赛德斯·奔驰、JCB、宜家、巴兰坦、华纳兄弟和DC。

他们为蛇口设计设计的V&A设计博物馆开发了“设计我”交互式装置，并为“失落的艺术画廊”赢得了SXSW交互式艺术奖，这是泰特美术馆首次在网上举办的展览。

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EMMA STIRLING-MIDDLETON
马霭琳



Emma Stirling-Middleton is China Project Curator at the Science Museum, London, and a co-investigator for the AHRC-funded project 'Time, Culture and Identity'. She was part of the curatorial team for the recent Hong Kong Science Museum exhibition *Treasures of Time*, which presented 120 of the Palace Museum clocks as well as a selection of 18th-century horological hand and machine tools from the London Science Museum. She is currently curating an exhibition of 25 of the Palace Museum clocks which will open at the Science Museum in 2020.

Before joining the Science Museum, Emma developed a number of exhibitions in collaboration with Chinese museums, including *Genghis: Rise of the Mongol Khans* (Inner Mongolia Museum, National Military Museum of the Netherlands) and *Romantic Scotland: Castles, Land and Sea* (Nanjing Museum, Historic Environment Scotland, National Galleries Scotland). Emma studied social anthropology with social history at the University of Edinburgh.

马霭琳是伦敦科学博物馆中国项目策展人。她也是英国艺术与人文研究委员会资助的“时间、文化与民族特征：中英联合开展历史研究、共同提升访客体验”研究项目的负责人。

马霭琳曾是香港科学博物馆“匠心独具：钟表珍宝展”策展团队的成员，该展览呈现120件故宫博物院的钟表，以及伦敦科学博物馆精选的十八世纪钟表指针和器械工具。她目前正在策划2020年在伦敦科学博物馆开的展览，预计展出二十五件故宫博物院钟表。

马霭琳在加入伦敦科学博物馆前曾经策划过许多和中国博物馆合作的展览，包含“成吉思汗：蒙古可汗的崛起”（内蒙古博物馆、荷兰国立军事博物馆）；“浪漫苏格兰：城堡、要塞和海洋”（南京博物院、苏格兰历史环境局、苏格兰国家美术馆）。马霭琳曾在爱丁堡大学攻读人类学和社会史。

WANG ZHIGANG
王之纲



Wang Zhigang is an associate professor at the Academy of Arts and Design, Tsinghua University, and a well-known multimedia visual designer. He is currently the Director of the Department of Information Art and Design at the Academy of Arts and Design, Tsinghua University; the Director of the Institute for Creative New Media and Performing Arts, Tsinghua University; and Deputy Director of the 9th New Media Art Committee of the China Institute of Stage Design. His research interests are the application of new-media art in the cultural tourism industry and in the performing arts.

王之纲，清华大学美术学院副教授，知名多媒体视觉设计师。现任清华大学美术学院信息艺术设计系主任、清华大学美术学院新媒体演艺创新研究所所长、中国舞台美术学会第九届新媒体艺术委员会副主任。主要研究方向为新媒体艺术，多应用于文旅产业及演艺事业。

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SUMMER XUE
薛贺



Summer Xue is co-founder and BD Director of the digital art platform OUTPUT. She graduated from the University of Wisconsin-Madison, majoring in printmaking and ceramics, and then completed a master's in arts management at Boston University. Since returning to China in 2013 she has worked as a marketing manager with China Guardian Auctions.

薛贺是 OUTPUT 数字艺术平台的联合创始人兼业务发展总监。她毕业于威斯康辛大学麦迪逊分校，主修版画和陶瓷，她接着在波士顿大学继续进修，并获得艺术管理硕士学位。在2013年回到中国后，她在中国嘉德拍卖行有超过5年市场营销经理的经历。

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YAO YANAN
姚燕安



Professor Yao Yanan is a PhD adviser and Executive Deputy Director of the Robotics Research Centre at Beijing Jiaotong University, and a principal investigator for the AHRC-funded project 'Time, Culture and Identity'. He was selected for the New Century Excellent Talents Programme by the Chinese Ministry of Education.

Yanan is a member of the Executive Council of the International Federation for the Promotion of Mechanism and Machine Science and a principal investigator for UNESCO in higher education and industry cooperation. He is also an Adjunct Professor of Beijing University of Chemical Technology and Shandong University of Science and Technology, and a part-time graduate tutor at the Central Academy of Fine Arts and the Lu Xun Academy of Fine Arts.

His original concept and design theory for the 'linkaged whole closed-chain mobile system' is known internationally, and he founded the Institutional Innovation and Robotics Laboratory. He has hosted more than 100 scientific research projects (including more than 40 provincial and ministerial-level ones), published 135 papers, been awarded 97 patents, supervised 65 graduate students and developed more than 50 kinds of products through technology transfer. He also proposed the concepts of 'geombot' and 'MSEAP' (a combination of mathematics, science, engineering, art and philosophy). He was awarded a second prize for invention by the Ministry of Education and has twice won a Beijing Science and Technology Prize.

姚燕安教授是北京交通大学博士生导师。姚教授是英国艺术与人文研究委员会资助的“时间、文化与民族特征：中英联合开展历史研究、共同提升访客体验”研究项目的主负责人。他现任职北京交通大学机器人研究中心执行副主任，获选教育部新世纪优秀人才，国际机构与机器理论联合会 (IFTOMM) 联合会执行委员会委员，联合国教科文组织高等教育与产业合作教席 (UNESCO Chair) 研究员。他同时为北京化工大学、山东科技大学兼职教授，中央美术学院、鲁迅美术学院兼职研究生导师。他在国际上提出“连杆式整体闭链移动系统”的原创概念和设计理论，创立“机构创新与机器人学实验室”。他主持承担科研项目100余项（其中省部级以上40余项），发表论文135篇；获发明专利授权97项；培养研究生65人；技术转让开发出产品50余种。他提出“几何机器人”科普概念和“MSEAP（将数学、科学、工程、艺术和哲学相融合）”教育与研究理念，主持获教育部发明二等奖1项、北京市科技奖2项。

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YU BO
于博



Yu Bo is a Director of Brand and senior planner at Blackbow. She studied digital art at the Communication University of China. In 2014 she obtained a master's degree in film and television directing from the School of Media and Communication at Bournemouth University. She has worked in one of China's largest internet groups responsible for brand content planning and dissemination, and lectured on 'city creations' for the course Advertising Creativity and Production taught at the Academy of Arts and Design, Tsinghua University in 2018 and 2019. In 2018, Blackbow was invited by the British Embassy in China to attend the Edinburgh International Culture Summit and Yu Bo spoke on traditional Chinese culture and new-media creativity. She is currently enrolled in advanced studies at the School of Design, Central Academy of Fine Arts (CAFA).

Yu Bo was responsible for projects such as the Tencent WE conferences in 2015, 2016 and 2017. She was also executive producer for Golden Horse Award-winning director Zhou Hao's documentary about a Go-playing AI, 7%; involved in planning the 2019 CAFA New Media Salon Show *Digital Media and the Hypertext Museum*; co-founder and executive curator for the Design Tour Project – *Dear Garbage* – for 2019 Beijing Design Week; executive curator for *China's New Cultural and Creative Industry*, featured at a Paris museum late-night opening; and creative director for a building projection show.

于博现任黑弓Blackbow品牌总监、资深策划。本硕就读于中国传媒大学数字艺术方向，并于2014年在英国伯恩茅斯大学取得媒体学院影视导演专业硕士。曾供职中国最大的互联网集团之一负责品牌内容策划及传播工作。2018、2019清华大学美术学院“城市创变客”《广告创意及制作》受聘讲师。2018黑弓受邀英国大使馆赴往爱丁堡艺术节文化国际峰会参会代表，演讲内容《中国传统文化与新媒体创意》。中央美术学院设计学院高研进修在读。

于博于博负责项目如腾讯WE大会（2015、2016、2017）；金马奖导演周浩AI人工智能围棋绝艺纪录片《7%》执行制片；2019年央美设计学院新媒体沙龙《数字媒体与超文本博物馆》策划；2019北京设计周设计之旅项目《亲爱的垃圾》联合发起人，执行策展人；2019“中国新文创”法国巴黎博物馆之夜执行策展人，楼体投影秀创意导演等。

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ZHANG BAICHUN
张柏春



Professor Zhang Baichun is Director of the Institute for the History of Natural Sciences at the Chinese Academy of Sciences, from where he received his PhD in the history of science and technology. His research focuses on the history of technology and mechanics, comparative history of knowledge transfer, and strategies of technological development. He is currently a special research fellow for the Science and Technology Think Tank at the Chinese Academy of Sciences.

Baichun is editor of a number of international journals on the history of technology, including *Science in Context*, *East Asian Science, Technology, and Medicine* and *Acta Baltica Historiae et Philosophiae Scientiarum*, and editor of a number of Chinese journals, among them *Studies in the History of Natural Sciences*, *Journal of Dialectics of Nature, Science and Society* and *Journal of Engineering Studies*. He has also edited the international book series *Boston Studies in the Philosophy and History of Science*. Baichun is a member of the academic committee of the Max Planck Research Library for the History and Development of Knowledge and was elected as a Fellow of the International Academy of the History of Science in May 2019.

张柏春教授是中国科学院自然科学史所所长。张教授取得中国科学院科学技术史博士，研究方向包含技术史、力学史、知识传播史与比较史、科技发展战略。他担任中国科学院科技智库特聘研究员，同时也是国际科技史学术期刊 *Science in Context* 编委，*East Asian Science, Technology, and Medicine* 编委，*Acta Baltica Historiae et Philosophiae Scientiarum* 编委。《自然科学史研究》、《自然辩证法通讯》、《科学与社会》、《工程研究》等中国期刊的编委。国际科技史学术书系 *Boston Studies in the Philosophy and History of Science* 编委，Max Planck Research Library for the History and Development of Knowledge 学术委员。他在2019年5月当选总部设于巴黎的国际科学史研究所 (International Academy of the History of Science) 院士。

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CHARLIE ZHANG
张林



Charlie Zhang was trained as an architect. He undertook research at the Interactive Architecture Lab, Bartlett School of Architecture, UCL, and graduated with distinction in 2014. He is passionate about spatial interaction in the built environment. In 2017 he founded Signal Alpha, which is an innovative full-service installation design studio based in Shanghai. Its practice involves creating interactive spaces, narrative interactions, interactive architecture and kinetic sculpture.

张林于2014年在伦敦大学学院巴特莱特建筑学院取得荣誉硕士学位。他热衷于研究互动建筑在建筑空间中的实践可能性。他的研究作品广泛在国际上展出及发表。于2017年在上海成立Signal Alpha工作室，提供空间装置设计以及安装服务，其领域包含创造互动空间、叙事装置、互动建筑及可动雕塑。

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RESEARCH PARTNERS

项目合作伙伴

Science Museum 伦敦科学博物馆

Tracing its origins from the Great Exhibition of 1851, the Science Museum has pioneered interactive science interpretation for more than eight decades and is the most visited museum in the UK by school groups. Among key objects on display are Charles Babbage's Difference Engine No. 1 (c 1832), Alan Turing's Pilot ACE computer (1950) and the Apollo 10 capsule that went into lunar orbit in 1969. The Science Museum is part of the Science Museum Group, which consists of five museums – the Science Museum in London, National Science and Media Museum in Bradford, Science and Industry Museum in Manchester, National Railway Museum in York and Locomotion in Shildon, County Durham.

伦敦科学博物馆的成立可追溯到1851年万国工业博览会。科学博物馆在过去八十载一直是运用互动演绎科学技术的先驱，且是英国最受学校团体欢迎的博物馆。馆藏中非常关键的藏品包括查尔斯·巴贝奇的差分机引擎一号（推测1832年）、艾伦·图灵的原型自动机计算机（1950年），以及在1969年环绕月球一周的阿波罗十号太空舱。科学博物馆是“科学博物馆集团”的一员，成员包括：伦敦科学博物馆、布拉德福德的国立科学与媒体博物馆、曼彻斯特的科学与工业博物馆、约克的国立铁路博物馆，以及杜伦郡的希尔登铁路博物馆。

Beijing Jiaotong University 北京交通大学

As one of the three Jiaotong universities, Beijing Jiaotong University (BJTU) can trace its history back to 1896. It is a key national university under the direct administration of the Ministry of Education and is now jointly supported by the Ministry of Education, China Railway Corporation and Beijing Municipal Government. BJTU was one of the first universities selected for the National 211 Project and the 985 Innovative Platforms for Key Disciplines Project, and one of the first institutions in China authorised to confer master's and doctoral degrees. The university has always targeted the frontier of scientific and technological development and the demands of major national strategy. Its foremost disciplines include information, management and transportation science and technology.

北京交通大学（北交大）是中国三所交通大学之一，其历史渊源可追溯到1896年。北交大是教育部直属，现为教育部、交通运输部、北京市人民政府和中国国家铁路集团有限公司共建的全国重点大学。北交大是“211工程”和“985工程优势学科创新平台”项目建设高校和具有研究生院的全国首批博士、硕士学位授予高校。北交大始终瞄准科技发展前沿和国家重大战略需求，其优势特色学科包括信息、管理和交通科学与技术等。

Institute for the History of Natural Sciences, Chinese Academy of Sciences 中国科学院自然科学史研究所

The Chinese Academy of Sciences is a group of educational and research institutes dedicated to scientific and technological research and development in China. It aims to be a national team and a driver of national technological innovation, a pioneer in supporting nationwide science and technology development, a think tank delivering scientific and technological advice, and a community for training young talent in these fields.

The Institute for the History of Natural Sciences was founded in 1975, forming a multidisciplinary and comprehensive national institute specialising in the study of the history of science and technology. The current Director is Zhang Baichun. Its predecessor was the Research Department on the History of Natural Sciences at the Chinese Academy of Sciences, established in January 1957 on the initiative of the academy's then Vice-President, Professor Zhu Kezhen. As a comprehensive academic body combining the sciences and humanities, the institute focuses on the study of the history, nature, routes and models of the development of science and technology.

中国科学院（中科院）是中国专注于自然科学与高技术综合研究发展与教育的最高学术机构。中科院的使命在成为引领国家科技创新的团队、支持国家科学技术发展的先驱，以及提供科学技术咨询和养成社区科学技术人才的智库。

