

## Strategic Research Theme

### Global Heritage: Science, Management and Development



#### **The 2<sup>nd</sup> Global Heritage Showcase & Exhibition**

Thursday 4 2019 July, 9 am – 5.30 pm  
Nottingham Conference Centre, Nottingham Trent University, City Campus

Exhibitions | Networking | Public lectures | Seminars

## Programme

- 8:30 – 9.00 Registration
- 9.00 – 9.10 **Welcome Address**  
Professor Nigel Wright, Deputy Vice Chancellor (Research & Innovation), Nottingham Trent University
- 9.10 – 10.00 **Keynote Address 1**  
**“Nile: Urban Histories on the Banks of a River”**  
Professor Nezar Al-Sayyad, Emeritus Professor of Architecture and Planning at the University of California at Berkeley
- 10.00 – 11.00 **Heritage & Museums**
- Discovering Southwell – Developing a Community-led Heritage Project**  
Neville Stankley and Dr Katharina Massing, Heritage & Museum, School of Arts & Humanities
- Coming to terms with Northern Ireland’s difficult past: 1968 @ the Ulster Museum**  
Dr Chris Reynolds, School of Arts & Humanities
- Remembering the Kindertransport in the 21<sup>st</sup> Century**  
Professor Bill Niven and Amy Williams, School of Arts & Humanities
- 11.00 – 11.20 Coffee Break
- 11.20 – 12.20 **Communities of Heritage**
- Dealing with the Past: Coal, Community and Change**  
Dr Natalie Braber, David Amos and Paul Fillingham  
School of Arts & Humanities
- Textile Tales**  
Tonya Outtram, Professor Amanda Briggs-Goode, Professor Tom Fisher, School of Art and Design
- Writing Skyscapes**  
Professor Phil Leonard, School of Arts & Humanities and Dr Daniel Brown, School of Science and Technology
- 12:20 – 13.20 Lunch & Exhibition Showcase Display
- 13.20 – 14.00 **Keynote Address 2**  
**'From Kathmandu's Earthquake to Jaffna Fort: GCRF-sponsored post-disaster heritage responses in South Asia'**  
Professor Robin Coningham, 2014 UNESCO Chair in Archaeological Ethics and Practice, Durham University

- 14:00 – 15.00     **Heritage Networks**
- Renegotiating the Narrative in Global Design Histories: What does it mean to be 'peripheral' to history, but central to your own story?***  
Dr Hui-Ying Kerr, School of Architecture, Design & the Built Environment
- The human dimensions of marine heritage conservation in the British Overseas Territories: an analysis of the Blue Belt network***  
Dr Roy Smith, Nottingham Business School, Dr Pete Howson, School of Arts & Humanities and Professor Elizabeth Kirk, Nottingham Law School
- Valuing cultural capital**  
Dr Patrizia Riganti, School of Architecture, Design & the Built Environment
- 15:00 – 15.20     Coffee break
- 15:20 – 16:20     **Urban Heritage in Global City**
- Organizing preservation and regeneration at the crossroads of heritage and street art in the art city of Malaysia***  
Professor George Kuk, Nottingham Business School
- NTU's Virtual Reconstruction of Nottingham Castle: Digital Archive for Sustainable Management and Planning in Heritage Buildings with Community Access***  
Antony Pidduck, School of Architecture, Design & the Built Environment
- Measuring response of heritage structures using low-cost vision-based systems***  
Dr Rolands Kromanis, School of Architecture, Design & the Built Environment
- Discovering Pugin at St Barnabas Cathedral***  
Yu Li, School of Science and Technology
- 16:20 – 17:20     **Future of Museums**
- Museums of the Future: Developing multi-disciplinary Research Alliance of Virtual Museums***  
Dr Diane Wren, Centre for Architecture, Urbanism & Global Heritage, School of Architecture, Design & the Built Environment
- The Museum Book project in Ho Chi Minh City***  
Dr Sophie Fuggle, School of Arts & Humanities
- Communities of Design***  
Kate Burnett, Curator and Designer
- 17:20 – 17:30     **Showcase Conclusion & Announcements**

## Posters/Exhibitions

Chris Pickup, School of Arts & Humanities	The Flawford Virgin; From Science to Interpretation
Jonathan Hamilton, School of Art and Design	Video and VR for Access to Fragile Archives
Jools Ayodeji School of Art and Design	Southwell Workhouse Project
Student Work School of Art and Design	Southwell Workhouse Project
Ruth Clifford School of Art and Design	Weaving Life: Innovations in the handloom textiles of Kutch
Charles Fox School of Art and Design	Found Cambodia
Dr Daniel Brown School of Science and Technology	Bromley House Library Meridian Sundial
Dr Daniel Brown School of Science and Technology	Heritage of Night Sky
Dr Daniel Brown School of Science and Technology and Professor Phil Leonard School of Arts & Humanities	Writing Skyscapes
Dr Chris Reynolds School of Arts & Humanities	Voices of 1968
Ivana Mancic School of Art and Design	The Impact of Female Voice in Serbian Contemporary Art and Conflict Representations
Neville Stankley School of Arts & Humanities	MA Museum and Heritage Development: Pedagogy, Practice and Professionalism
Carol Adlam School of Art and Design	Graphic Novel Adaptations of Museum and Archive Texts
Professor Eiluned Edwards School of Art and Design	Global Cultures of Textiles and Dress Research Group
Deborah Tuck School of Art and Design	Learning in the museum using AR
Amy Hondsmerk School of Arts & Humanities	Playing with Interpretation: The Video Game in Museums and Heritage

Dr Natasha Hodgson School of Arts & Humanities	From Myth to Majesty: an historical and scientific exploration of fifteenth-century British royal genealogies from the 'Noah' tradition
Hua Zhong School of Architecture, Design & the Built Environment	Digital Technology to Support Sustainable Retrofitting and Regeneration of Historic Buildings
Yousif Al-Daffaie School of Architecture, Design & the Built Environment	Historic Cities as Targets in Political Conflict: Mapping and tracking conflict in Mosul and paving sustainable peace for its post-conflict era
Dr Marisela Mendoza School of Architecture, Design & the Built Environment	Historic Concrete Shells
Professor Benachir Medjdoub and Daniel Anton Garcia School of Architecture, Design & the Built Environment	Digital presentation of the 3D modelling of St Barnabas
Dr Ana Souto School of Architecture, Design & the Built Environment	Mapping Nottingham's Identity
Sortiria Kogou School of Science and Technology	Automatic non-invasive analysis of Cave 465 murals at the UNESCO site of Mogao Caves
Professor Bill Niven and Amy Williams, School of Arts & Humanities	An International Exhibition on the Kindertransport
MA Museum and Heritage Development 2018/19 School of Arts & Humanities	Notes on an Exhibition
MA Museum and Heritage Development 2017/18 School of Arts & Humanities	Canal Visions
Jo Lees St Ann's Allotment	St Ann's Allotment

## **Keynote Speakers**

We are pleased to welcome the following Keynote Speakers and thank them for their support:

### **Professor Nezar Al-Sayyad, Emeritus Professor of Architecture and Planning at the University of California at Berkeley**

Nezar AlSayyad is an architect, planner and urban historian. Co-founder of the International Association for the Study of Traditional Environments (IASTE), he was Faculty Director of the Center for Arab Societies and Environments Studies (CASES) and Center for Middle Eastern Studies (CMES) for two decades. Today, he still serves as the Editor of the Association's highly acclaimed peer-reviewed journal *Traditional Dwellings and Settlements Review*. His publication span many disciplines including research on tradition, heritage and globalization and their connection to the built environment. In 2014-15, AlSayyad was awarded a Distinguished Guggenheim Fellowship which he used to do research for his upcoming book *Nile: Urban Histories on the Banks of a River*, which will be out in September from Edinburgh University Press.

### **Professor Robin Coningham, 2014 UNESCO Chair in Archaeological Ethics and Practice, Durham University**

Robin Coningham is Professor of Early Medieval Archaeology at Durham University and holds UNESCO's 2014 Chair in Archaeological Ethics and Practice in Cultural Heritage. He has worked across South Asia refining chronologies and investigating the region's urbanization, the genesis of Indian Ocean trade and the archaeology of Buddhism. He is committed to the protection of cultural heritage and has co-directed UNESCO's archaeological and community engagement activities within the Greater Lumbini Area of Nepal since 2011. Professor Coningham has published over 100 academic papers and chapters, as well as 10 books, including 'The Archaeology of South Asia' in the Cambridge World Archaeology series in 2015 with Ruth Young, 'Appropriating the Past: Philosophical Perspectives on the Practice of Archaeology' with Cambridge University Press in 2011 with Geoffrey Scarre, and Pivot Palgrave's 'Archaeology, Heritage Protection and Community Engagement in South Asia' in 2019 with Nick Lewer. He has successfully co-designed and led fieldwork, exhibitions and workshops for UNESCO, AHRC, GCRF and the British Academy in Asia for over 25 years.

## Abstracts

### ***“Nile: Urban Histories on the Banks of a River”***

Professor Nezar Al-Sayyad, Emeritus Professor of Architecture and Planning at the University of California at Berkeley

The Nile has captured the imagination of the world since ancient times. It has been researched, traveled, controlled, harnessed, mythologized and spiritualized. This talk is about the journey to write a new book “Nile: Urban Histories on the banks of a Great River” (In Press – Edinburgh University Press)

The talk like the book views the Nile as both the stage for the enactment of important human events and an actor in their unfolding history. It examines the intersection of natural forces and human intervention to take readers on a series of historical journeys – from the river’s highland sources, through the desert, to the Mediterranean Sea.

The Nile, which travels thousands of miles before it ultimately reaches the sea, has been the source of great fascination for many peoples and individuals, and not only those who have inhabited its banks. Over millennia, millions of people have lived and died on its fertile banks, and hundreds of others have died trying to reach its sources. Dozens of explorers, adventures, colonizers, soldiers, geographers, historians, geologists, archaeologists, hydrologists, and political scientists have also written books about it over the centuries. But very little has been written about the Nile by urban historians interested in its relation to built environments. It is the intention of this book to remedy this deficiency by narrating the rise and fall of cities that have appeared and disappeared along its banks, either for environmental or political reasons, as it has changed its physical course and character through history.

Herodotus’s famous statement that “Egypt is the gift of the Nile” has been the most common saying about Egypt since Classical times. But it is important to remember that this river, which is the longest in the world, travels through a host of different countries, and that its journey through Egypt occupies less than one-fifth of its total course. Moreover, the Nile was not the always the same river it is today – indeed, it did not even always flow in the same direction. Through history, there have been many ancient Niles.

### ***Discovering Southwell – Developing a Community-led Heritage Project***

Neville Stankley and Katharina Massing, School of Arts & Humanities



Southwell, a small market town in Nottinghamshire has a unique and rich heritage landscape that includes sites of national importance, such as the Southwell minster and the Southwell workhouse, and a distinct local culture and history. While it has several active community groups involved in diverse cultural activities, there is little cooperation between them. In order to promote and explore Southwell’s cultural heritage further the Southwell Heritage Trust aims to develop a community-led heritage project, that allows for a democratic approach to heritage management, serves as a vehicle for sustainable tourism development and brings the community and different cultural initiatives together.

At the moment Southwell Heritage Trust and Nottingham Trent University are exploring the concept of the ecomuseum to achieve this, as its core principles are based around the sustainable, holistic and democratic management of cultural heritage sites. Ecomuseums pay equal attention to official and unofficial heritage sites

and aim to maintain a sense of place through *in situ* safeguarding and interpretation of heritage.

As part of the development process in Southwell several community consultation exercises have been undertaken, including a quantitative questionnaire and several events using a human centred design methodology. This paper discusses Southwell's the concept behind Southwell's approach to safeguarding and promoting its cultural heritage in a holistic and democratic manner. It analyses the results of the community consultation undertaken up to this point and particularly focusses on the human centred design methodology that aimed to encourage the community to engage with different understandings of Southwell heritage and the project through making 'something new', that is informed by their needs and desires.

### ***Coming to terms with Northern Ireland's difficult past: 1968 @ the Ulster Museum***

Dr Chris Reynolds, School of Arts & Humanities

The proposed paper contributes to the debate on the increasingly prominent role of museums in the interpretation of what have become known as 'difficult histories'. It begins by outlining the impact and legacy of contested history within the context of Northern Ireland before focusing on how and why some museums have come to see their role and purpose, and define their social impact, in relation to the increasingly prevalent practice of confronting uncomfortable heritage. The role of National Museums Northern Ireland (NMNI) and its experiences in interpreting contested history then provides the backdrop for a discussion of its recent collaborative project on the seminal events of 1968. Using this case-study, it will be argued that museums can indeed be a constructive arena for assisting post-conflict societies confront and deal with the challenges of the past. In particular, museums provide the ideal context for the development of strategies drawing on an 'agonistic' approach that accepts that one must avoid seeking to rewrite history in the interests of achieving an impossible consensus. The innovative combination of the 1968 project's methodological and theoretical approach provides potentially valuable lessons for the broader challenge of dealing with the difficult legacy of Northern Ireland's past as part of the ongoing peace process and offers a possible blueprint for others to adapt in their efforts to confront their own 'difficult histories'.

### ***Remembering the Kindertransport in the 21<sup>st</sup> Century***

Professor Bill Niven and Amy Williams, School of Arts & Humanities

Thanks to generous funding by NTU Global Heritage Fund, we travelled to Berlin in December 2018 to show our two exhibitions on the Kindertransport at the British Embassy. One of these focused on the Kindertransport from a British-German perspective. As a result of our visit, we were asked to cocreate a new exhibition on the Kindertransport which will be opened in Berlin-Charlottenburg in August 2019. The exhibition represents a collaboration between NTU, PhotoWerkBerlin, and Aberystwyth University, and will be in both German and English. It is the first British-German exhibition on the Kindertransport and represents an attempt to bring together the different national and international perspectives – exactly as we had hoped to do. We will present the ideas behind this exhibition, and the reasons for its importance.

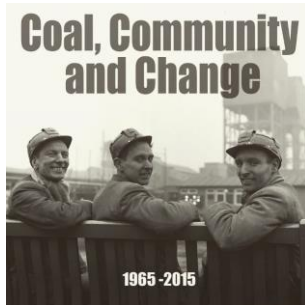


## ***Dealing with the Past: Coal, Community and Change***

Dr. Natalie Braber, School of Arts & Humanities

David Amos, School of Arts & Humanities

Paul Fillingham, Thinkamigo Digital



The coal industry, once a main employer of the region, has a long and proud association with the arts and this project aims to deal with the contested memories of mining in the region – both with the strike and the end of coal mining more generally – through photographs and images. It is an important topic as this area was a particular focus of the strike in 1984-85 and histories have not been forgotten with long-term resentment continuing in the present day.

By engaging with the cultural side of the heritage, it is hoped that both sides of the strike feel they have something to offer to this project. Such work with contested memories has been successful in relation to the Troubles in Northern Ireland but work of this sort has never been conducted in the East Midlands mining industry. This project aims to work along the lines of 'agonistic' memory (e.g. Bull and Hansen 2016), where both sides accept that there is conflict and how to deal with this more constructively. Recent conversations with one of the Unions contained the comment 'there are two sides to every story: but ours is the right one'.

With the ageing mining population, it is now the time to deal with this conflict to try and avoid long-standing resentments continuing into future generations. Currently the most important issue is to work with the preservation of mining heritage and the engagement of a younger audience and both sides need to engage with this to ensure such tangible and intangible heritage is not lost forever.

The exhibition is currently touring around the East Midlands and is being shown at: Mansfield Museum, Chesterfield Museum, Harworth County Council, The National Coal Mining Museum for England, Conkers Discovery Centre and Nottingham Contemporary.

This paper will discuss the reasoning behind the project as well as the design of the exhibition itself, ensuring not only interest for an audience of former miners, but also accessibility to those who have no knowledge of mining. We will also discuss ways of engaging audiences, through interaction and participation with the exhibition to gain feedback and views from visitors.

## ***Textile Tales***

Tonya Outtram, Professor Amanda Briggs-Goode and Professor Tom Fisher, School of Art and Design

The East Midlands is the historic heart of the UK's textile industry. Focussing on the period 1980-2005, which saw turmoil as the industry rapidly contracted, the Textile Tales Project is running a series of 'road-shows' to gather oral history interviews from former textile employees. Future generations can learn much from their heritage, including skills that are becoming scarce in the parts of the industry that still exist, and this may be the last chance to let workers and managers who lived through this period share their stories. Training volunteers to collect these stories, and running a selection of roadshows around the region, the project aims to strengthen the regional textile heritage network by forging closer links between the partner institutions and the wider community.

## **Writing Skyscapes**



### **Authors & Contributors**

- Dr Daniel Brown (Associate Professor of Astronomy and Science Communication, NTU)
- Hannah Cooper-Smithson (PhD researcher, English, NTU)
- Holly Corfield Carr (Poet and PhD researcher, University of Cambridge)
- Dr Jo Dixon (Research Assistant, English, NTU)
- Richard Hamblyn (Writer and Lecturer in English, Birkbeck, University of London)
- Dr Sarah Jackson (Associate Professor in Literature, NTU)
- Prof. Phil Leonard (Professor of Literature & Theory, NTU)
- Helen McGhie (Artist, Manchester, and PhD researcher, University of Sunderland)

Led by researchers and writers specializing in astronomy and literature from NTU, and hosted by Creswell Craggs Museum and Prehistoric Gorge and Backlit Gallery, Writing Skyscapes is a two-day workshop that invites participants to consider sky and astronomical heritage. Crossing disciplinary divisions and bridging modern and ancient approaches, the aim of this project is to explore new ways of engaging with the sky from multiple viewpoints and from both rural and urban perspectives. This includes thinking about the nature of looking as well as considering the possibilities for looking 'differently'.

When we do look up at the sky, especially with today's technologies and devices, we might assume that we are able to see more, to see more clearly, or to see further. While this is true in some senses, the more we look at or to the sky, the more that we find ourselves questioning both what we are seeing and where we are. What we see in the sky and beyond the planet's atmosphere often defies recognition or classification. And looking to the sky and beyond requires us to think differently about where we are. *Writing Skyscapes* will explore these and other issues relating to how we see, imagine, and write about what is above us.

The project is informed by current work in cultural astronomy, which considers the intangible nature of sky heritage and examines the ways that different societies make new sky stories. During the workshop, participants will think about their own sky stories and participate in a rich variety of immersive activities, including a landscape walk, a cave tour, a planetarium visit, and a site-specific poetry reading. Working with astronomers, and with writers and artists including Holly Corfield Carr, Richard Hamblyn, and Helen McGhie, they will be invited to try out a range of innovative approaches to writing about the sky and their relationship with it.

**'From Kathmandu's Earthquake to Jaffna Fort: GCRF-sponsored post-disaster heritage responses in South Asia'**

Professor Robin Coningham, 2014 UNESCO Chair in Archaeological Ethics and Practice, Durham University

Cultural heritage offers us a sense of identity, maintains social diversity, cohesion, and intercultural dialogue, and forms our basic right to participate in cultural life. It plays critical roles in education, conflict mitigation and sustainable development but is threatened by accelerated development, mega-infrastructure, mass tourism, looting, encroachment, neglect, climate change, natural disasters, erosion and targeted destruction. Following Nepal's devastating earthquake in 2015, the Government of Nepal and UNESCO mobilised Durham's UNESCO Chair in Archaeological Ethics and Practice in Cultural Heritage to assist in the evaluation and assessment of damaged monuments in the Kathmandu Valley's UNESCO World Heritage Site. Establishing new multidisciplinary partnerships with architects, engineers, historians, conservators, heritage managers, first responders and local communities through AHRC-GCRF funding, the team co-designed methodologies to record and safeguard heritage sites after such natural disasters as well as focusing on the recycling of historic building materials. With additional support from the British Academy's GCRF Cities and Infrastructure programme, we are now piloting methods to reducing disaster risk to life and livelihoods by evaluating the seismic safety of Kathmandu's historic urban infrastructure in direct support of SDG11. Committed to capacity strengthening and support of SDG17, we extended our bilateral partnerships across South Asia through the participation of multidisciplinary specialist from Sri Lanka, India and Myanmar in post-disaster field laboratories with the support of the Alliance de Protection du Patrimoine Culturel Asiatique. In turn, this network has initiated a new GCRF-funded partnership with the Central Cultural Fund (Government of Sri Lanka) and the University of Jaffna to use our post-disaster experience to co-design new post-conflict methodologies to protect the war-damaged heritage of Jaffna and northern Sri Lanka.

**Renegotiating the Narrative in Global Design Histories: What does it mean to be 'peripheral' to history, but central to your own story?**

Dr Hui-Ying Kerr, School of Architecture, Design & the Built Environment



In recent years, there has been an increasing focus on the global and interconnected nature of design histories. However, scholarship has mostly focused on the processes and implications of transcultural flows (Adamson, Riello, Teasley, 2011), without a coherent strategy of approaching the non-West as both an important and yet canonically



peripheral entity. Furthermore, the non-West's relationship with widespread influence and proliferation of Western culture, and consequent articulation, negotiation and repositioning of their own agency through material forms (new media, design, material and visual culture), has not as yet been critiqued as a major method of inquiry. Following the Design History Society's affiliated panel at the College Arts Association Annual Conference, CAA 2018, a 2-day summer workshop was organised, funded by the strategic NTU Global Heritage Seed-corn Fund. Gathering participants to facilitate research in this area, the aim was to explore issues of centrality, periphery, conflict, subversion and dialogue with the hegemony of patriarchal, often Western, modernisation, and thus interrogate how non-Western narratives in global design history construct themselves in relation to the international, the accepted canonical, and their challenge to the status quo.

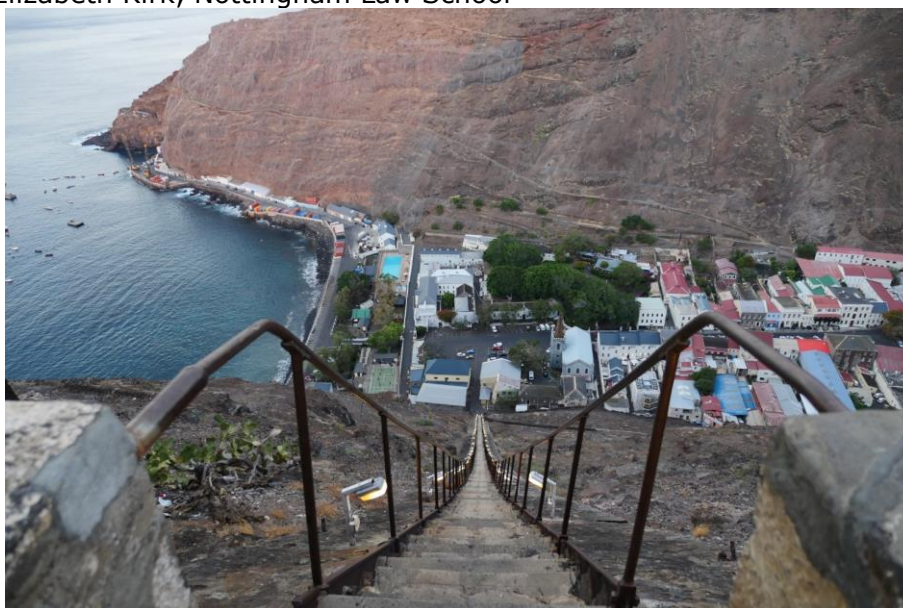
Through points of intersection between subjects and disciplines, and themes of material, space, place, agency, relationships and networks, this presentation will demonstrate how we created a core framework, contributing towards a methodological toolkit addressing this research area as a discipline. In this way, we intend for the research generated to be a challenge to the hegemony and centrality of the West in design history.

Workshop participants include:

Zara Arshad (Victoria and Albert Museum / Design History Society)  
Rebecca Bell (Royal College of Art), Magali an Berthon (Royal College of Art)  
Vivien Chan (University of Nottingham / Design History Society)  
Ruth Clifford (Nottingham Trent University)  
Carrie Cushman (Columbia University)  
Natalia Goldchteine (Independent Scholar)  
Di Liu (Hong Kong Asia Art Archive)  
Dr Sandy Ng (Hong Kong Polytechnic)  
Professor Susan Reid (Loughborough University)

***The human dimensions of marine heritage conservation in the British Overseas Territories: an analysis of the Blue Belt network***

Dr Roy Smith, Nottingham Business School  
Dr Pete Howson, Arts and Humanities  
Professor Elizabeth Kirk, Nottingham Law School



Jacob's Ladder overlooking Jamestown, St Helena.

The vast majority of global fish stocks are over-exploited. Receding coral reefs due to climate change, bleaching, pollution events, and other forms of human-induced degradation are removing vital breeding habitat for fish, exacerbating the problem of overfishing. To address these threats, the UK Government has proposed plans for a 'Blue Belt' – a network of large Marine Protection Areas (MPAs) enclosing 4 million km<sup>2</sup> of overseas territorial waters by 2020. The Blue Belt would become one of the world's largest enclosures for marine heritage conservation, involving many UK overseas territories. These territories accommodate over 90% of the UK's biodiversity, meriting five UNESCO World heritage sites of natural and cultural significance as well as 15 Ramsar designated wetlands. While potentially desirable from a conservation perspective, concerns are being raised over coastal livelihoods, as well as the integration of national security, and private sector interests, with marine conservation. The human dimensions – the social, political, and economic costs and benefits of these very remote MPAs – is also yet to be determined. Inevitably, an understanding of these human dimensions is what the Blue Belt's success depends on.

Initial fieldwork has been undertaken in the South Atlantic British Overseas Territory of St Helena. Interviews were conducted with local government representatives, private sector investors and the local fishing community. The creation of the marine protected area around St Helena is a significant development for the island, although best understood within the broader context of other developments, such as the move away from a ferry service to scheduled flights from South Africa. Fish processing capacity and the ability to access international fresh tuna markets was identified as a concern, as was the potential impact of an increased number of tourists visiting the island, although numbers are currently manageable. Relevant stakeholders have been invited to NTU to participate in a workshop to discuss initial findings with a view to expanding this project to engage with additional British overseas territories.

### ***Valuing cultural capital***

Dr Patrizia Riganti, School of Architecture, Design & the Built Environment

**Organizing preservation and regeneration at the crossroads of heritage and street art in the art city of Malaysia**

Dr George Kuk, Nottingham Business School

Dr Stephanie Giamporcaro, Nottingham Business School

Nicole Chang, Universiti Sains Malaysia



In this paper, we use the concept of meta-organizations to examine the agentic roles of both artists and non-artists through art entrepreneurship. We use the art city of Malaysia – Penang as our research site to examine the practice of art entrepreneurship and its role in preserving and revitalizing the city. We conducted a multi-sited, in-depth field study to uncover some of the key periods and events since Penang was granted the UNESCO world heritage status in 2008. We identify three phases to illustrate how metaorganizations evolve through the ways the material and the social are enacted in practice. The first phase is marked by the city’s authorities physically branding the city through material installation of a series of steel-rod caricatures. The second phase is marked by the organic emergence of street art as a new material media for instilling playfulness, meaning and social identity. The third phase is marked by material contestation where the proliferation of street art in preserving heritage is challenged.

**NTU’s Virtual Reconstruction of Nottingham Castle: Digital Archive for Sustainable Management and Planning in Heritage Buildings with Community Access**

Antony Pidduck, School of Architecture, Design & the Built Environment

Nottingham Castle is currently undergoing a major refurbishment and development to enable future sustainable use. Much of the building history, layered structures of different ages, medieval to 19/20th century additions, have neither been accurately recorded, analysed nor digitally reconstructed.

The future management of heritage assets requires digital smart tools to focus on sustainable management. The outcome is to design a novel methodology for structuring information through digital modelling and virtual heritage platforms. This repository will provide organised access for the stakeholders throughout the building lifetime providing resilience as the building evolves further to support the needs of the community without losing sight of the significance and social value. The project targeted a novel state-of-

the-art interactive platform for digital and virtual heritage platforms that advance the role of virtual museums in the future.

The Virtual Reconstruction of Nottingham Castle Project was undertaken by the NTU Centre for Architecture, Urbanism and Global Heritage in partnership with Nottingham Castel Trust and Nottingham City Council and was aimed at developing a virtual resource charting the Ducal Palace's historic evolution. Using archival material, records and laser scanning surveys of the Grade 1 building to enable accurate digital models of the associated history to chart the building evolution. The owner, Nottingham City Council and the Nottingham Castle Trust that manage the asset are collaborating with the team to develop a research-led digital open resource to use not only in management but also in interpretation and education.

The research team developed a detailed digital model and virtual experience for outside of the Ducal Palace, including the tunnel and grounds to the gatehouse, and the archaeology in the courtyard. Collated in the form of point-cloud and mesh, this digital model has enabled the development of innovative virtual tour of the Ducal Palace and the castle art galleries, which was recently showcased at the Digital Heritage 2018 Exhibition in San Francisco. The recent workshop held at Nottingham Conference Centre brought together a range of stakeholders to discuss the project, interact with the product of the research and determine the viability of future extensions to the project.

This paper discusses the project from inception identifying the research strategy, collected data and the workshop outcome finally exhibiting the digital solution in a virtually reality tool.

### ***Measuring response of heritage structures using low-cost vision-based systems***

Dr Rolands Kromanis, School of Architecture, Design & the Built Environment

Applications of computer vision are becoming prevalent in measuring bridge response. Response can be calculated when tracking structural features such as bolts or connections in video frames while the bridge is subjected to loadings. Usually static and dynamic responses are measured. During routine bridge inspections cameras could be used to collect structural deformations induced by applied loads such train crossings. However, the challenge is to make sure that the camera is placed in the same location during the subsequent inspection to allow accurate comparison response. This study addresses two challenges:

- 1) if videos capturing a bridge subjected to loading from multiple angles/locations can be analysed to derive accurate and comparable response
- 2) if low-cost systems can capture small deformations happening in short intervals.

In the first study, smartphones were placed at different positions to the Wilford Suspension Bridge (Grade II listed heritage structure) to capture its dynamic response. Structural features are selected, and their locations are calculated in video frames. Feature locations from both smartphones are transformed to a reference coordinate system (obtained from structural drawings). Results show that locations of features can be accurately transformed to the reference coordinate system. Obtained structural response can be compared and analysed.

In the second study, NTU Vision-based structural health monitoring (VB-SHM) group joined AECOM's Intelligent Infrastructure Team on monitor shifts of a masonry arch bridge with stone spandrels. The bridge crosses A162 at the South of Barkston Ash. The bridge was recently equipped with a monitoring system by AECOM and Cambridge Centre for Smart Infrastructure and Construction. The system includes crack sensors, strain gauges and videogrammetry targets. The aim of the collaboration was to test low-cost videogrammetry using generic systems in parallel with established videogrammetry monitoring systems and conventional monitoring equipment and compare their outputs as an option to collect bridge vertical deformations induced by trains.

### ***Discovering Pugin at St Barnabas Cathedral***

Professor Haida Liang, Yu Li, School of Science and Technology

Professor Benachir Medjdoub, Daniel Anton, Dr Ana Souto, School of Architecture, Design and the Built Environment

NTU has been awarded a National Lottery Grant in partnership with Nottingham Cathedral to highlight the relevance of Pugin's work in Nottingham. The main aim is to reach as many stakeholders as possible, putting St Barnabas again on the map as a community asset, a landmark that tells a story about Nottingham's identity, its past, present, and its continuity in the future. NTU is undertaking cutting edge scanning of the building to create a 3D model of its structure, together with the scan and analysis of the historic paint scheme. A research exercise to understand Pugin and St Barnabas and sacred spaces in Nottingham, as well as their contexts, is supporting the development of a mapping exercise. This research in progress showcases the relevance that St Barnabas and other sacred spaces have in the community, information which will inform the development of new strategies to strengthen their significance in Nottingham.

The Cathedral Church of St. Barnabas in Nottingham is a fine example of Gothic Revival architecture in England. It was consecrated as a Church in 1844 and as a Cathedral in 1852. The architect was Augustus Welby Pugin, who also designed the decoration of the Houses of Parliament in London. Within the Cathedral, the Blessed Sacrament Chapel has been described as a "prayer book in stone". Unfortunately, the interior decorative scheme by Pugin was never completed due to a lack of funds. The chapel went through several redecorations and restorations. Therefore, how much work had been done in the original decoration or the later modifications remains unclear. Material analysis is essential to the study of the history of a painting and to inform conservation decisions. Raman spectroscopy, which provides information about the molecular structure of the material, is a valuable tool for pigment identification. Here we demonstrate a novel remote Raman spectroscopy system for in situ investigation of the murals in the Blessed Sacrament Chapel at stand-off distances >3m. It was successfully deployed for the analysis of different areas of the mural at distances of 4-14 m, under ambient light. Identification of the painting materials could potentially help sorting out the period of various painting scheme.

### ***Museums of the Future: Developing multi-disciplinary Research Alliance of Virtual Museums***

Dr Diane Wren, Centre for Architecture, Urbanism & Global Heritage, School of Architecture, Design and the Built Environment

As immersive digital technologies have become much more accessible, new possibilities in forms of interactive engagement for the heritage sector have opened up. The *Museums of the Future Research Alliance* aims to develop a series of collaborative activities and research programmes looking at the use of digital technologies to record, display and preserve heritage, making it more accessible for members of the public and researchers. *Museums of the Future* engages multidisciplinary researchers, experts and stakeholders in heritage, history, creative industries, archaeology and architecture to investigate potential applications of digital technology in the museum sector. It will explore the impact, accessibility and feasibility of the use of new forms of interactive engagement and how these can be used to facilitate outreach to national and international audiences.



### ***The Museum Book project in Ho Chi Minh City***

Dr Sophie Fuggle, School of Arts & Humanities

Ho Chi Minh City has a rich museum culture with many of its museums also housed in historic buildings. Sophie Fuggle has been involved in an ongoing project with academics, research consultants and museums in Ho Chi Minh City to find ways to better showcase the city's museum heritage at the same time as identifying gaps in research both in terms of museum technologies and narratives. At the heart of the project is the creation of a Museum Book, a regular publication intended to tell the story of Ho Chi Minh City's museums to both a general public and a network of museum and heritage professionals.

### ***Communities of Design***

Kate Burnett, Curator and Designer and Jonathan Hamilton, School of Art and Design



*The first VR prototype of Paul Browns' studio being used by a participant at OISTAT 50 International Theatre Conference, Cardiff, 2018 (Photo; Jonathan Hamilton)*

This unique case study, Seedcorn funded by Global Heritage, documented the design studio of the recently deceased, international opera theatre designer, Paul Brown. A collaboration between co-investigators Kate Burnett - scenographer and award-winning curator of performance design, with Jonathan Hamilton, film maker and researcher in Graphic Design.

'Communities of Design' indicates the research imperatives which originated in NTU's long history of design training; in Walter Gropius' 1919 Bauhaus manifesto advocating combined studio practice of 'students, journeymen and master craftsmen'; in our collaborator, the V&A's commitment to collecting and exhibiting Design for Performance as exemplifying Art, Craft and Design. Using the case study of Brown's studio, team and work, to document and reflect on the methodologies of contemporary studio practice and learning; on innovation in both design processes and recording techniques; on the survival, sustainability and development of studio practice, and legacies of traditional performance design practice.

Design for theatre and opera at the scale of Brown's work is only achievable collaboratively. Brown's subterranean studio hosted a small community of exceptionally skilled assistant designers and model makers. Within a limited timeframe, video interviews with Browns' studio assistants and collaborators were made in the studio

space before its dismantling. Documenting the studio, Hamilton used intensive photogrammetry to capture the space for a VR installation. Intending to produce an authentic representation of the space capturing atmosphere, mood, light qualities and detailed surface textures, aiming to give a more immersive experience.

Browns' design models, artefacts and drawings with their complex surface treatments were also documented using a range of methods and technologies including video, photography and 3d scanning. The intention being to include these within the VR space but also to have this content accessible online for when VR is not available for students.

For Hamilton the development of this project has been an intensive study of photogrammetry's potential in helping to create an art and design aesthetic for VR as an alternative to the "gaming" aesthetic. Testing the early VR prototype at the OISTAT50 workshops gave valuable feedback, users informing the project's development. Experimenting with recording further scale models and continuing dialogue with a variety of experts and users, including the digital studios of the Royal Opera House and National Theatre. Burnett has continued to develop the curatorial aspects of this project in collaboration with the V&A, Prague Quadrennial and RWCMD for the National Museum of Wales.

## **Posters and Exhibitions**

### **The Flawford Virgin; From Science to Interpretation**

Chris Pickup, School of Arts and Humanities

This PhD research explores scientific and conservation-based research activity within our museums. It proposes that museums are either 'scientifically-research-enabled' or 'non-scientifically-research-enabled' and this subdivision has a profound effect on the nature and practice of scientific research within those establishments. It proposes that 3D documentation, animation and film can be used to motivate non-scientifically-research-enabled museums to explore object biography through this research activity, creating a powerful tool for public engagement. However, it also offers the provocation that the relationship between a research enabler (e.g. academic researcher) and non-scientifically-research-enabled end user is complex and problematic if not handled with co-productive skill.

A scientifically-research-enabled museum is one that has the funding and remit to carry out scientific research into its collection. However, this represents only a percentage of the holders of our nation's material culture. Many museums based within our regions have no such remit and are focused on public engagement. This is problematic, as only scientific research that can deliver a public engagement output is viable. It is also the case that many of these museums no longer support the facility and staffing to engage in scientific research activity. However, universities are interested in research being impactful to meet the needs of the REF. This has produced an increased interest in reaching wider audiences through research and suggests the potential for a symbiotic relationship. The university provides scientific-research-enablement to a non-scientific-research-enabled museum with both stakeholders wanting public engagement.

A case study was established, researching items from the collection of Nottingham Castle Museum and Art Gallery with research-enablement provided by Nottingham Trent University's heritage science unit ISAAC. This allowed the team to experience the challenges of delivering a rigorous scientific output and then presenting that to the end user as a relevant public engagement (Mind the Gap: Dillon et al 2014). This case study enabled an investigation of the different motivations and barriers for the two stakeholders that did not automatically align. A level of symbiosis was achieved by employing 3D animation and film to communicate the research process and provide a public engagement platform for it. The investigation then embarked on a programme of interviews with professionals outside the case study to contextualize the research. The overall conclusions now being reached are that many difficulties are generated by a lack of empathy between the academic and museum environments which is surmountable but requires substantial co-productive management skill and planning.

### **Video and VR for Access to fragile archives**

Jonathan Hamilton, School of Art and Design

This film demonstrates a practice-based case study seeking to create new ways of documenting and giving access to fragile heritage archives.

Using video and extreme close up macro cinematography the project creates new views of fragile museum objects, with the aim to create greater audience engagement for both online and onsite museum experiences.

The presentation shows work created with an international watch and clock collection and the archive of an internationally significant opera and theatre designer. The extreme

close up video utilises both robotic and hand held cinematic cameras, enabling a moving view around and through objects. Using advanced focusing systems that at times resemble that of the human eye helps to demonstrate both the material aspects of the objects as well as give an intimate and more personal experience than other types of documentation.

Further development of the project will explore 3D scanning of objects as well as the role CT and Industrial CT scanning could play in revealing what is not optically visible.

### **Heritage Design Project at The Workhouse, Southwell**



#### **Organisation:**

Andrea Moneta: project coordinator

Janet Overfield Shaw: National Trust Creative and Community Programme Officer

Jools Ayodeji: documentary director

NTU Designers:

Bessie Allan, Chrissie Burton, Katy Goodwin, Aimilia Ioannou, Angela Martin, Molly Williams;

Performers:

Ruth Baker, Hardijs Gruduls, Ann Keen, Jill Steel, Dinah Wilcox, Karen Winyard.

Nottingham Trent University BA (Hons) Theatre Design year 3 students and The Workhouse's Volunteers, worked on a creative project which explored the history of mental health support in UK, to develop a final costumed performance open to public at The Workhouse, Southwell.

After completing an exploration of both the site and the history of the building, six Theatre Design students worked together with volunteers of The Workhouse to develop a costumed performance inspired by personal and recorded stories, using The Workhouse's spaces; these six 'environments' engaged the visitors in a promenade theatre performance on Saturday 27th April 2019.

The project involved BA (Hons) Filmmaking course leader Jools Ayodeji, that filmed and directed a documentary of the whole project, including backstage and interviews. Heritage Design is a research-led year 3 realised project in which the interaction with volunteers' real stories and the Workhouse's history, become the founding role to search forgotten, denied or unexpressed stories and meanings; the aim is to reveal these stories through a creative process that involves public art and design for performance.

## **Weaving Life: Innovations in the handloom textiles of Kutch**

Directed by Ruth Clifford, produced and edited by Prachi Mokashi, camera and interview support by Shradha Jain

This film aims to tell the story of handloom weaving in Kachchh, north west India through the voices of the weavers and other stakeholders in craft development in the region. It tells of the history, traditional processes and techniques and the way in which weavers are innovating within the parameters of their inherited skill set and pattern repertoire, for contemporary high-end Indian and global markets. Innovation has been encouraged and supported by a local design education institute, Somaiya Kala Vidya (formerly Kala Raksha Vidhyalaya) founded in 2005 which provides a year-long curriculum covering basic design, colour, market orientation, concept, collection development and finishing and presentation and merchandising.

Somaiya Kala Vidya was a focus case study of Ruth's PhD research, and she chose to use film as a way of providing a platform for the research participants to tell their stories, which is often not possible in academic research where commonly the researcher speaks on behalf of the participants. Filming interviews with weavers was carried out to capture the non-verbal communication such as gestures and body movements, and importantly for this research to show the weaver demonstrating his or her thought process behind designs and the concepts they'd learnt at the design school, using their products as a point of reference which are included in the frame. In this way, the film aims to capture the embodied knowledge and creativity of the weaver as well as the visual, tangible expression of this knowledge in the form of the woven cloth. Thus, film has the potential to challenge hegemonic, often Eurocentric 'literate' discourses on textile and craft histories in non-western countries. Overall, the film aims to highlight both the successes and challenges that both the handloom industry in Kachchh is facing as well as Somaiya Kala Vidya.

Across India, since rural artisans lost their local markets to cheaper mass-produced goods, they have mostly relied on urban designers to position their goods in high end urban and global markets. However, this arrangement often results in the urban designer receiving all the credit for the design, while the artisan is anonymous and their traditional knowledge often ignored or devalued. With increased cultural, social and economic capital, on top of expert embodied knowledge of their craft, creativity and contact with urban and global clients, graduate artisan-designers of SKV are challenging these hierarchies and becoming designers, social change-makers, taste-makers and trendsetters in their own right.

## **Found Cambodia**

Charles Fox, School of Art and Design

It has been over thirty years since the end of the Khmer Rouge regime, which resulted in the deaths of an estimated two million people. 'Found Cambodia' is an online platform which houses visual vernacular of pre- and post-Khmer Rouge Cambodia ([www.foundcambodia.com](http://www.foundcambodia.com)). The project forms part of a long-term investigation by photographer Charles Fox into post-conflict Cambodia, and the transformations of the Cambodian society after 1979.

'Found Cambodia' was formed as a reaction to the notion of the 'closed archive', and it expresses the need to discuss historical issues visually when dealing with post-conflict. In addition, the project deals with the photographer's own frustration when working with documentary photography in the representation of post-conflict subjects. 'Found Cambodia' is an ever-growing and morphing platform, which embodies a constant process of investigation and re-categorisation of images. Its aim is to understand the human aspect of narrative through the collection of memories and visual vernacular.

Most importantly, the platform seeks to develop an understanding of the proximity through which we might be able to approach key historical events through their multifaceted documentation. The project's website allows individuals to engage with their own questioning and interpretations, and it also serves as a point of visual reflection for photographer Charles Fox himself.

### **Bromley House Library Meridian Sundial**

Dr Daniel Brown, School of Science and Technology

In collaboration with the Institute of Physics and Bromley House Library we have explored one of the oldest meridian sundials in the UK first documented in 1834. A selection of visual impressions will illustrate how we successfully engaged audiences regionally with the science of time and our local science heritage. The project was supported by a summer research student and pre-16 work placement students. Its legacy is substantial, leading to a planned national network event linking up other meridian sundials in the UK and featuring in the IoP inauguration of their new London HQ.

### **Heritage of Night Sky**

Dr Daniel Brown, School of Science and Technology

Our cultural heritage extends and includes the sky especially the night sky. A selection of visual impression are presented that capture a range of holistic approaches to access, understand and communicate this heritage. These examples are drawn from a current MSci project on limiting human eye magnitudes in the context of passage graves; as well as several summer student research projects and pre-16 placements on deeper phenomenological engagement with the sky in and around contemporary land art by James Turrell and capturing the richness of the night sky heritage using planetarium software.

### **Writing Skyscapes**

- Dr Daniel Brown (Associate Professor of Astronomy and Science Communication, NTU)
- Hannah Cooper-Smithson (PhD researcher, English, NTU)
- Holly Corfield Carr (Poet and PhD researcher, University of Cambridge)
- Dr Jo Dixon (Research Assistant, English, NTU)
- Richard Hamblyn (Writer and Lecturer in English, Birkbeck, University of London)
- Dr Sarah Jackson (Associate Professor in Literature, NTU)
- Professor Phil Leonard (Professor of Literature & Theory, NTU)
- Helen McGhie (Artist, Manchester, and PhD researcher, University of Sunderland)

Led by researchers and writers specializing in astronomy and literature from NTU, and hosted by Creswell Craggs Museum and Prehistoric Gorge and Backlit Gallery, Writing Skyscapes is a two-day workshop that invites participants to consider sky and astronomical heritage. Crossing disciplinary divisions and bridging modern and ancient approaches, the aim of this project is to explore new ways of engaging with the sky from multiple viewpoints and from both rural and urban perspectives. This includes thinking about the nature of looking as well as considering the possibilities for looking 'differently'.

When we do look up at the sky, especially with today's technologies and devices, we might assume that we are able to see more, to see more clearly, or to see further. While this is true in some senses, the more we look at or to the sky, the more that we find ourselves questioning both what we are seeing and where we are. What we see in the sky and beyond the planet's atmosphere often defies recognition or classification. And

looking to the sky and beyond requires us to think differently about where we are. *Writing Skyscapes* will explore these and other issues relating to how we see, imagine, and write about what is above us.

The project is informed by current work in cultural astronomy, which considers the intangible nature of sky heritage and examines the ways that different societies make new sky stories. During the workshop, participants will think about their own sky stories and participate in a rich variety of immersive activities, including a landscape walk, a cave tour, a planetarium visit, and a site-specific poetry reading. Working with astronomers, and with writers and artists including Holly Corfield Carr, Richard Hamblyn, and Helen McGhie, they will be invited to try out a range of innovative approaches to writing about the sky and their relationship with it.

During the course of the weekend, participants will produce a short extract of writing that can be exhibited alongside the *Writing Skyscapes* exhibition at Backlit Gallery and at Creswell Craggs.

### **Voices of 1968**

Dr Chris Reynolds, School of Arts & Humanities

### **The Impact of Female Voice in Serbian Contemporary Art and Conflict Representations**

Ivana Mancic, School of Art and Design

My research topic is *The Impact of the Female Voice in Serbian Contemporary Art and Conflict Representations*. The research aims to explore and document the examples of contemporary art practice and pacifism that reflect the developing female voice in Serbia. Practice-based approach is an integral element of the research as I am creating artworks that present my inspirational response to the patriarchal society and war thus giving my contribution to this complex problem.

### **MA Museum and Heritage Development: Pedagogy, Practice and Professionalism**

Neville Stankley, School of Arts & Humanities

The MA in Museum and Heritage Development revalidated in 2017 set out to create a scholar-practitioner. Following extensive sector consultation, the qualification puts the emphasis on the analysis of real issues and practical, creative problem solving, centring on the workplace experience. Whilst developing academically on the course, students are able to develop a working relationship with external professionals and organisations through an innovative mentoring scheme which is embedded within the course in order to support students in their achievement of learning outcomes. As a result of these pedagogic innovations, in a very competitive employment sector, graduate employment is strong and for the first time there is a regular flow into further study.

### **Graphic Novel Adaptations of Museum and Archive Texts**

Carol Adlam, School of Art and Design

## **Global Cultures of Textiles and Dress Research Group**

Professor Eiluned Edwards, School of Art and Design

The Group aims to promote research in textiles and dress that addresses a wide range of critical and practice-based themes. Textiles and dress are part of daily human experience and yet their familiarity belies complex social, cultural and historical circumstances. Bearing this in mind, a major focus of the Group's work is to explore the significance and meaning of textiles and dress across cultures and time, and research underway covers a range of social and cultural contexts, historical periods and technologies, covering handmade production – craft – as well as industrial manufacture. Working with academic partners and others from industry, cultural institutions, designers, craftspeople and entrepreneurs, the Group has established research collaborations at local, national and international level, producing innovative research of lasting significance that is socially meaningful. It draws on a range of expertise across the field of textiles, dress and craft production and offers a particular regional focus on Asia, with India and Hong Kong especially well represented in its research. Members of the Group have already attracted income from major funding from organisations including, AHRC, Pasold Research Fund, Leverhulme Trust, British Academy, and Nehru Trust.

## **Learning in the museum using AR**

Deborah Tuck, School of Art and Design

It can be difficult for museums to convey the historical connections and stories behind an object when using traditional physical displays. Museums have been using digital technologies, which offer new ways to deepen visitor engagement. The affordances of AR promote exploration and interaction with exhibits using smart mobile devices. Museum exhibits use AR applications and markers to trigger overlay of text, audio or video to deliver contextual information about the exhibits. This augmented information is similar to the traditional physical labels, video screens and information boards found in museums that offer contextual information.

Storytelling is a common tool used for understanding the world around us. The format helps us to communicate, remember and learn. Narrative is used in museums and heritage sites to provide interpretations of social history, engaging visitors with theatrical interactions, delivered by actors dressed as historical characters to communicate a "sense of the times".

Engagement is key to learning and both AR and storytelling offer opportunities for engaging the visitor in the museum. The practice-based research uses storytelling in combination with augmented reality to investigate if this can be used to engage an audience and help them learn about their past. Analysed data was gathered using interviews with focus groups, museum curators and staff, online visitor questionnaires and ethnographic observations of the public exhibition in addition to video tracking data of participants points of view of the exhibition.

When combined with storytelling AR can help people to learn about the past in and fun and engaging way. Story helps them to remember and make connections while interaction makes them feel more involved, affecting their feelings and emotions about their connections to history. This raises new questions about how they respond and feel about "interacting with history" with the potential to intervene with historical events.



### **Playing with Interpretation: The Video Game in Museums and Heritage**

Amy Hondsmark, School of Arts & Humanities

This project critically examines the prospective role of video games in the museum and heritage sector, focusing specifically on their potential as tools for interpretation. In particular, the research will focus on exploring how interpretation is understood and variously undertaken within the museum and heritage sector, how video games are suited to act as tools for interpretation, and the ways in which video games can contribute to the museums sector's development and design of digital tools for interpretation.

### **From Myth to Majesty: an historical and scientific exploration of fifteenth-century British royal genealogies from the 'Noah' tradition**

Dr Natasha Hodgson, School of Arts & Humanities

The Canterbury Roll is a 5m long genealogical scroll written in Latin in 15th century England dating from Henry VI's reign. During the Wars of the Roses, a large number of such genealogies were produced, but this Roll is one of only 14 in which the royal line starts with Noah, most of which are housed in British collections. Acquired by the University of Canterbury (NZ) in 1918, little is known about its provenance beyond its purchase from the Maude family in New Zealand in the early twentieth century. Using a combination of scientific and historical techniques, the current project aims to deepen our understanding of the cultural relationship between genealogy, religion, history, heritage and society. In November 2017 this cross-disciplinary project was awarded funding by the Global Heritage strand to use non-invasive scientific imaging and spectroscopic techniques offered by the NTU ISAAC Mobile Lab to reveal hidden/faded information and to characterise the material on the roll in order to inform the historical research. The current phase of the project investigates similar examples of the 'Noah' group in the UK for the purposes of comparison with the data gathered in 2018, in order to provide parallels which could answer long-unanswered questions about the provenance and tradition of this manuscript, and laying the foundations for a joint UK and NZ grant bid to re-examine the Wars of the Roses through fifteenth century royal genealogical manuscripts.

### **Digital Technology to Support Sustainable Retrofitting and Regeneration of Historic Buildings.**

Hua Zhong, School of Architecture, Design and the Built Environment

In Europe, buildings are responsible for 40% of energy consumption and 36% of CO emissions, and whilst new buildings are more energy efficient, in developing countries (e.g. China) these figures are even higher with nearly 40% of CO<sub>2</sub> resulting from the building sector. Sustainable retrofits of historic buildings have shown increasing attraction on investment from both public and private stockholders, in EU, USA and China.

### **Historic Cities as Targets in Political Conflict: Mapping and tracking conflict in Mosul and paving sustainable peace for its post-conflict era**

Yousif Al-Daffaie, School of Architecture, Design and the Built Environment

Carrying the identity, socio-cultural and historical values, historic city centres are constantly in the scope of political conflicts as strategic targets to initiate damage. This paper aims to investigate the reasons and the ways historic city centres play a dynamic role as targets within political conflicts. With Mosul's Old Town as a case study, the paper will investigate the role of the Old City Centre as a resort for ISIS within their last

occupation of Mosul. The actions of ISIS in the old city will explicate the role of the historic city centre as a target, and as a resource for 'heritage hostages'. The ongoing conflict will later be further interrogated through applying Wehr's guide for conflict mapping. The outputs from the guide will underline methods and priorities for constructing sustainable peace in Mosul's old town, as means to reinforce the current rebuilding process. The sustainable peace concept will take into account the sectarian, ethnic and tribal segregation and address the sentiment of marginalization among the Mosuli people.

### **Historic Concrete Shells**

Dr Marisela Mendoza, School of Architecture, Design and the Built Environment

The material I proposed to present at the exhibition builds on the research work I have developed to date on historic concrete shells in the UK and Mexico and which was funded by the RIBA Research Trust Awards. I will also be presenting the work developed in collaboration with students and sponsored by the Scholarships for Undergraduate Researchers -SPUR- programme. The presented material will mainly analyse two seminal listed concrete shells in the UK- The John Lewis Warehouse on which I wrote an article in the Cambridge Journal: Architectural Research Quarterly and the Queensgate Market Hall at Huddersfield Historic Concrete Shells- presented and published in the proceeding of the Construction History Society, Cambridge 2017.

### **Discovering Pugin at St Barnabas Cathedral**

Professor Haida Liang, Yu Li, School of Science and Technology  
Professor Benachir Medjdoub, Daniel Anton, Dr Ana Souto, School of Architecture, Design and the Built Environment

NTU has been awarded a National Lottery Grant in partnership with Nottingham Cathedral to highlight the relevance of Pugin's work in Nottingham. The main aim is to reach as many stakeholders as possible, putting St Barnabas again on the map as a community asset, a landmark that tells a story about Nottingham's identity, its past, present, and its continuity in the future. NTU is undertaking cutting edge scanning of the building to create a 3D model of its structure, together with the scan and analysis of the historic paint scheme. A research exercise to understand Pugin and St Barnabas and sacred spaces in Nottingham, as well as their contexts, is supporting the development of a mapping exercise. This research in progress showcases the relevance that St Barnabas and other sacred spaces have in the community, information which will inform the development of new strategies to strengthen their significance in Nottingham.

#### **Digital presentation of the 3D modelling of St Barnabas**

Benachir Medjdoub and Daniel Anton Garcia, School of Architecture, Design & the Built Environment

#### **Mapping Nottingham's Identity**

Ana Souto, School of Architecture, Design & the Built Environment

## **Automatic non-invasive analysis of Cave 465 murals at the UNESCO site of Mogao Caves**

Sotiria Kogou, Dr Golnaz Shahtahmassebi, Professor Haida Liang, School of Science and Technology

Biwen Shui, Wenyuan Zhang and Bomin Su, Dunhuang Academy, Gansu Province, China

The Mogao cave, a UNESCO site in the Gobi Desert of China, is a Buddhist temple site with a history that extends from the 4<sup>th</sup> C to the 14<sup>th</sup> C. The total painted area that covers a surface 45,000 m<sup>2</sup> is an immense resource for the study of the history of art, religion, science and technology and cultural exchange along the Silk Road. Cave 465 is unique in its Tibetan Buddhist style, with its construction date being still a subject under debate amongst historians and archaeologists. This study illustrates the scientific analysis of the painting materials and techniques to assist its dating.

Spectral imaging has increasingly been adopted in the analysis of various types of artworks. The non-invasive nature of the technique makes the imaging of whole architectural interiors feasible. Our development of a remote spectral imaging system for automatic imaging of large painting surfaces in high resolution from distances of tens of meters allows the initial examination of large areas from different parts of the murals. Spectral similarities imply similarities in the material composition. The exposure of the murals to natural environmental conditions over the last thousand or so years results in complexity in their material composition (i.e. ranging from original un-degraded pigments, to materials at different level of chemical degradation and physical weathering). The application of a novel clustering method on the large spectral dataset narrowed down significantly the spectra that are representative of the various material compositions, and thus reducing the number of analysis, that needs to be conducted in detail with a suite of other complementary techniques, into a manageable size. The detailed analysis was achieved following a multimodal approach with the combination of a series of non-invasive analytical techniques, such as X-ray Fluorescence (XRF), Raman and high spectral resolution fibre optics reflectance (FORS) spectroscopies. The clustering of the paint regions at inaccessible heights (e.g. murals on the ceiling) with areas at the ground level enabled the extension of the detailed material identification with relative certainty. Multivariate statistical analysis enabled also the revealing of faded or erased writings and drawings over large areas of the mural, including those that are not visible in any spectral band.

## **An International Exhibition on the Kindertransport**

Professor Bill Niven and Amy Williams, School of Arts & Humanities

Thanks to generous funding by NTU Global Heritage Fund, we travelled to Berlin in December 2018 to show our two exhibitions on the Kindertransport at the British Embassy. One of these focused on the Kindertransport from a British-German perspective. As a result of our visit, we were asked to cocreate a new exhibition on the Kindertransport which will be opened in Berlin-Charlottenburg in August 2019. The exhibition represents a collaboration between NTU, PhotoWerkBerlin, and Aberystwyth University, and will be in both German and English. It is the first British-German exhibition on the Kindertransport and represents an attempt to bring together the different national and international perspectives – exactly as we had hoped to do. We will present the ideas behind this exhibition, and the reasons for its importance.

## **Notes on an Exhibition**

MA Museum and Heritage Development 2018/19

This provides a visual overview of the work that students did with the National Justice Museum in the planning, development and delivery of their current temporary exhibition: Liberated Voices: Stories of Women (In)Justice.

## **Canal Visions**

MA Museum and Heritage Development 2017/2018 led by Elizabeth West

This film was created by the students on MA Museum and Heritage Development for the Enchanted Water Light Night event down at the canal in the city centre

## **St Ann's Allotment**

Jo Lees

We are based on St Ann's Allotments, a unique heritage site due to – size, age, overall level of 'intactness' and rarity (only one other area of detached gardens in UK are listed with English Heritage and which is a smaller site?)

- It's in Nottingham
- There are already some heritage research / data available but the site offers lots of research opportunities around....
  - o Fruit tree heritage
  - o Other horticultural heritage
  - o Urban planning/development
  - o Vernacular architecture across the site
  - o Allotment dialect/language
  - o Social history – how have the gardens been used over time, how does the site reflect (or not) the ethnic diversity changes over the last several decades; contested stories around the gardens/site being used by 'wealthy' Victorians versus poor people living on site
  - o Opportunities for exploring new technologies in engaging people with history, cultural change, archaeology etc e.g. apps, virtual reality, augmented reality
  - o Opportunities around help with curation, interpretation and dissemination of databases, artefacts
  - o Oral histories

This would be a great opportunity to explore future collaborations and partnerships.