Design
Research
for Change
2019

Paul A. Rodgers (Editor)

Introduction

Design Research for Change 2019 is a showcase of over 60 design-led projects that transcend disciplinary, methodological, geographical, and conceptual boundaries. The projects illustrate wide-ranging social, cultural, and economic impact and highlight the significant roles that UK-based Design researchers play in some of the most complex and challenging issues we face both in the UK and globally and the positive outcomes that are being designed and developed.

The work showcased here was developed by researchers and practitioners from a range of design disciplines including product, graphic, fashion, architecture, and textiles working with others in specialist areas such as healthcare, business, computing, engineering, and elsewhere. Many of the design research projects featured in this catalogue are based in one of the four Arts and Humanities Research Council's design-focused Centres for Doctoral Training, which are aimed at fostering the best design talent in organisations throughout the UK.

As I write the introductory text to this catalogue, we face numerous issues and challenges both globally and in the UK. These challenges are complex and significant and, for many, the future is uncertain. Today, we face a new industrial age where technologies are rapidly transforming the way we live, work and communicate with one another. Whilst various technologies are making us more efficient and productive at work and changing the way we do business they are, at the same time, contributing to high levels of stress and unease amongst us. We are also living in an age where political, social, economic, and environmental disruption are having massive effects on how we go about our day-to-day lives.

The future for many is uncertain and consequently many questions require answers. What will the future of work look like? What will our cities, towns, and villages of the future be like? How will we better care for the planet in the years ahead? How will we look after an increasingly ageing population? What does the future truly hold for the UK?

Buckminster Fuller, the famous American architect, systems theorist, author, designer, inventor and futurist, told us "The best way to predict the future is to design it."

So, as we move through the fourth industrial revolution and witness our lives being changed in ways we never could have imagined, new forms of design research are needed to power our economy, our society and our reputation across the world.

To this end, this catalogue presents over 60 design-led research projects that seek to break new ground in the months and years ahead. These projects are led in many cases by an Early Career Researcher (ECR), an individual who is within 8 years of the award of their PhD or equivalent professional training, or an individual who is within 6 years of their first academic appointment. They are tackling a number of major significant and complex challenges such as developing design tools and processes that will support people living with dementia to live high quality lives, designing systems that ensure childrens' educational rights are met, designing interventions for supporting more sustainable and inclusive breastfeeding practices, and designing methods for producing more sustainable food practices.

All of these research projects highlight the amazing design research talent we have in the UK. Moreover, the research showcased here illustrates the innovative and creative ways of working that will ensure our designed futures are in safe hands. I hope you enjoy the excellent design research showcased in Design Research for Change 2019.

Professor Paul A. Rodgers
AHRC Design Leadership Fellow
Lancaster University

Foreword

We are witnessing an incredible shift in the pace and scale of societal and technological change affecting all of us, all around the world. Design has responded to these changes in a range of ways with new design disciplines emerging and design playing a role in a number of domains where it previously had none from policy-making to healthcare to global systems change. Design research has long played an integral role in design's ability to confidently contribute to these new domains, but often remains invisible behind the outcome and the design thinking process. Importantly, design research helps to improve knowledge and understanding across the discipline and beyond it, cementing the power and potential of design. The 2019 "Design Research for Change" catalogue therefore aims to highlighting the range and importance of design research by showcasing over 60 varied and engaging projects led by Early Career Researchers based in the UK. From research in physical spaces such as hospitals, classrooms, libraries, museums, rooftops and refugee camps to research into empathy, imagination and memory, these projects demonstrate the diversity of UK design research and how it can positively contribute to a wide range of social, cultural, economic and environmental outcomes. While much could be written about these projects individually, the strength here is in the overall collection, highlighting the important and growing role of design research in the UK to addressing some of the most challenging issues facing society today, including the climate emergency and access to education, public space, and health care. I hope that this catalogue and the future Design Research for Change catalogues serve not only to shine a light on design research, but also provoke discussion and collaboration about how we might work together across disciplines to tackle the most pressing challenges of the day.

Sevra Davis
Head of Learning
The Design Museum

List of Projects

Designed with deMEntia

**Euan Winton,
Paul A. Rodgers &
Emmanuel Tsekleves**

Imagination, Lancaster
University

'Designed with deMEntia' comprises a range of products designed by inspiring people who are living with dementia. Through their thoughtful and creative collaboration, they have shared personal insights and opinions, and combined existing skills, experience and knowledge with new design approaches to create some outstanding designs. The products exist as a result of collaborative relationships and build upon cultural visits to art galleries, museums, public events and gardens. The designs created by the participants resulted in prototypes that have subsequently been professionally produced by a number of collaborators and companies to form a range of limited-edition pieces. Presented as a range of fabrics, furniture, lighting and homewares, the work shows thoughtful consideration and presentation of these cherishedcollaborations. Offered for public consumption through a pop-up shop in the St. Enoch Centre in Glasgow, the products have spread the word about what people living with dementia are capable of. The pop-up shop brought together a collection that was achieved through workshops held in Edinburgh, Glasgow, Lancaster and Newcastle.

'Designed with deMEntia' is an AHRC funded project that shows how design can play a key role in empowering people living with dementia in their improved decision making, social interaction and personal achievements whilst supporting those individuals to work as part of a larger collective.

In the design, manufacture, exhibition, and dissemination of the designed objects we show that people living with dementia have much to offer to society and we hope to change public thinking about what is possible post-diagnosis. The combination of approaches undertaken and the resultant designs celebrate the creative capacity of people who are living with dementia formed as objects of value that the public can appreciate.

Microbial Storytelling and Paths of Pathogens in Hospitals
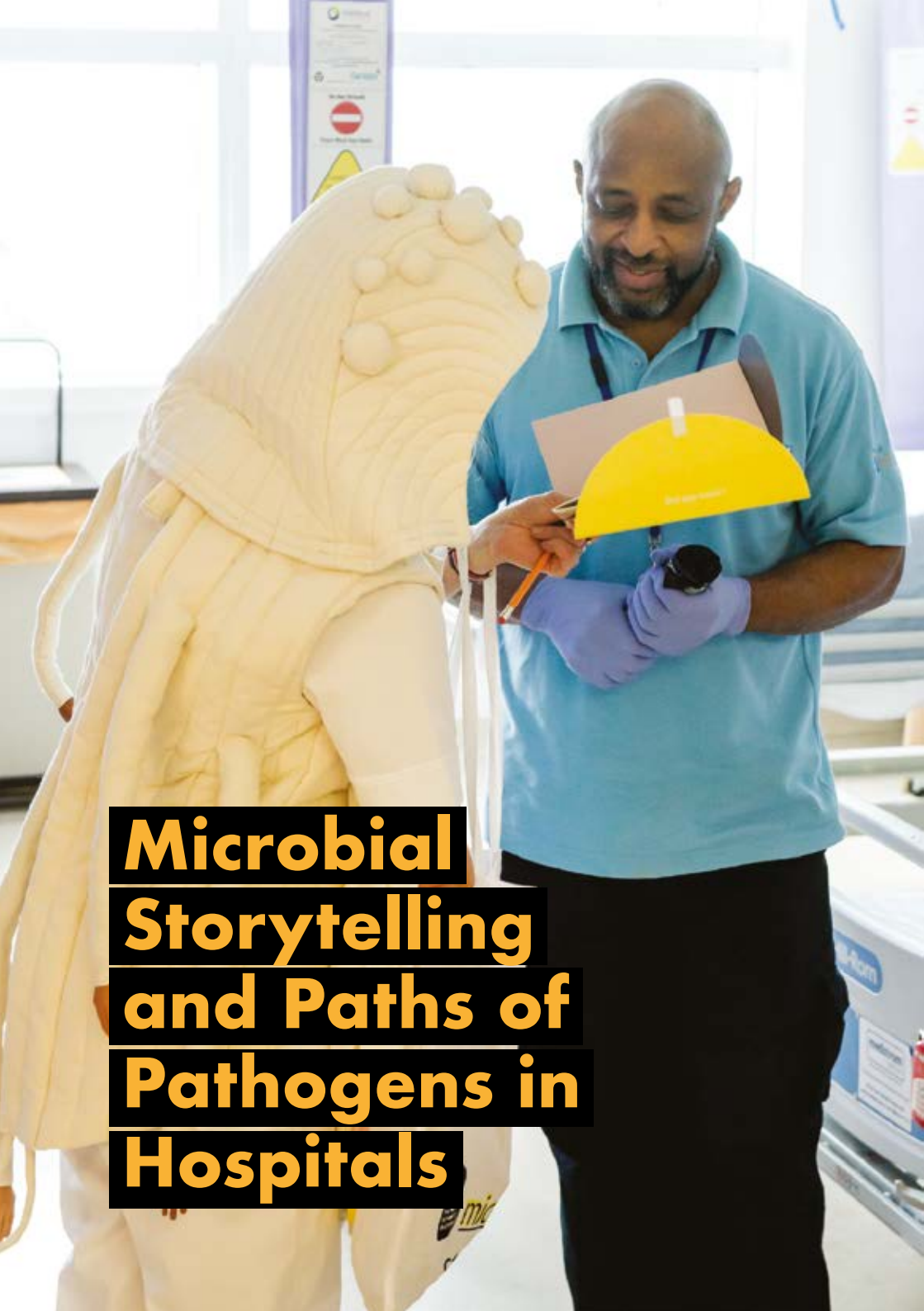
**Julia Backhaus,
Kerstin Sailer
& Alan Outten**

The Bartlett School of
Architecture, UCL

Funded by the AHRC, this research project addresses issues of infection prevention control and transmissions risks in hospitals. It explores how design can become a tool to interrupt or break infection pathways. Through a detailed architecturally informed Space Syntax analysis, the research team is investigating the invisible complex network of relationships between microbes, humans and architecture, space and behavior and the interdependence between the various professional roles on the hospital ward. In two different hospitals, they have mapped the paths of over 100 agents populating wards: doctors, nurses and other healthcare workers, but also frequently overlooked groups such as porters, cleaners, caterers, etc.

Whilst the research team has conducted spatial data collection discretely and in a hidden manner, one key intention of their design interventions was to create visibility directly on the ward. Through storytelling, narrative and creative visualisation of the research findings, the aim is to inspire curiosity and appreciation of the hidden microbial life (good and bad) and make hidden movement paths and embedded behaviors visible.

At the same time, the aim of the project is to make under-researched and neglected agent groups visible (such as porters, cleaners, catering staff) by giving them a voice and engaging everyone directly in the design process through participatory design events. By acknowledging users as experts of their own experiences, design can empower and be used as a catalyst to overcome hierarchies and silos – seeing the designer as a facilitator and care-taker and the design interventions as mediators to communicate.

Design as a Socio-material Tool for Public Breastfeeding

**Sally Sutherland,
Tom Ainsworth,
Nigel Sherriff &
Mathilda Tham**

University of Brighton

This practice-based design research seeks to develop new insights into UK breastfeeding customs to enable more supportive, sustainable and inclusive practices. The research remains in the early stages – is a work in progress – currently in the first of a three-year AHRC Design Star funded doctoral programme. Design is used as a socio-material tool for inquiry and as a way to reflect and understand the world, building on emerging research in design and maternal health. The project aims to face head-on issues related to design and women's health, such as taboo, care, public intimacy, hypersexuality, femininity and expectations of motherhood.

Despite the overwhelming benefits of breastfeeding, rates in the UK remain among the lowest in the world. While initiation rates are high, public breastfeeding is often cited as a reason for stopping. Breastfeeding is a sensitive subject that presents challenges that are complex and multifaceted. Design, as a mode of practice, can connect society, culture and change, through its ability to identify and challenge perceptions, offer new solutions and imagine different opportunities and possibilities. As such, it engages with the socio-material practices that are central to everyday life. This project uses design research methods to identify and challenge the socio-cultural, environmental, moral and ethical determinants of breastfeeding. In a practical sense, this research has an interdisciplinary methodological approach as the work engages with and uses theory and practice. The supervisory team spans the University of Brighton School of Architecture and Design, the School of Health Sciences, and Goldsmiths University, with a focus on ensuring that the work can be shared across disciplines. The study uses 'research through design' as a concept for approaching the inquiry through the practice of design. Building on design anthropology and discursive design methodologies, creative methods act to enrich the breadth and depth of the research.

Connected Seeds Library

Sara Heitlinger,
Nick Bryan-Kinns,
Hamed Haddadi &
Nanda Khaorapapong
City, University of London

The 'Connected Seeds Library' is a co-designed, interactive seed library that lives permanently at Spitalfields City Farm in East London. The library aims to empower communities by connecting them to their heritage through food, and supporting more sustainable food practices in the city by making available locally-grown seeds and the knowledge required to grow them. In this way, the 'Connected Seeds Library' is helping support UK's seed sovereignty.

Visitors to the library can select a jar of seeds and place it on a designated pad in order to start a slideshow of images from the gardens. They can turn a wheel to play 1-minute-long audio tracks of the grower talking about their experiences of growing. Visitors can join the library for free, take seeds home, and bring some back at the end of the season to maintain the living stock. The seeds have been saved by 15 seed guardians, who come from ethnically diverse backgrounds and have saved seeds from crops not typically grown in the UK.

The 'Connected Seeds Library' was produced as part of an 18-month EPSRC-funded research project called 'Connected Seeds and Sensors', conducted at Queen Mary University of London, which explored networked sensors, data collection, and participatory design for sustainable urban food practices. The project was developed collaboratively with Spitalfields City Farm and other growing communities in East London, by identifying opportunities for digital and networked technologies to help collect and share the rich local knowledge of food-growing and seed-saving in East London. This knowledge is particularly rich due to large scale immigration and ethnic diversity in the area. The 'Connected Seeds Library' was created together with Franc Purg and Matt Jarvis.

Scotland's Digital Design Futures

**Bronwin Patrickson,
James Livesey,
& Clive Gilman**
University of Dundee

This project explores what blockchain and related data sharing technologies might offer for Scotland's Digital Design Industries. Targeting fragmentation and precarity, hypothetical designs featured in the final report include a collaboratively designed Dundee crypto coin intervention, shared profit agreements in student graduate release packs, pooled social enterprise investments, as well as a collective, digital production data-monitoring and sharing initiative. When digital production data is shared and combined as part of a cross-sectoral collaboration, it can potentially reveal optimum production methods, proven time-scales, average costs and the like.

Blockchain technologies power cryptocurrencies like bitcoin, but they are about much more than money. Using the power of the crowd to check that a transaction has indeed occurred as agreed, blockchain-related technologies enable secure and direct exchange between people, without the need for third parties like banks.

Already, this facility is helping to fight corruption and curb fee extortion practices that exploit vulnerable people in developing countries. This sort of peer-to-peer exchange technology can potentially also enable communities around the world to self-manage all sorts of civic, cultural and community value transfer. Paper-based local alt-currencies already bolster regional economies. Computerised exchange formats have the potential to augment that capacity even further. Through the use of computerised agreements known as smart contracts, linked to these transactions, parties can ascribe value to preferred behaviours (such as votes, or information exchange) and control how, when, where and in what contexts those digital values can be exchanged. Research projects already underway include initiatives such as personal data banks and conditional donations, as well as efforts to promote authenticated supply chains and community sharing, and also champion the hidden value of social care work. In this way, a technology for digital value exchange becomes a tool for social change.

Whose Smart City?

**Lorena Melgaço,
Katharine Willis,
Ava Fatah,
Satyarupa Shekhar,
& Ana Paula Baltazar**
Plymouth University

There is an increasing importance given to digital technologies in the design of cities, often referred to as the 'smart city'. The design research challenge therefore is to look at who would best contribute to the shaping of the smart city and to understand the links between digital placemaking and inclusion. The AHRC International Research Network: 'Whose Right to the Smart City?' examined how and why cities and people are shaping smart cities to suit their needs and the role of civic inclusiveness in this process. It involved an interdisciplinary team of academics and activists and comprises partners from University College London (UK), Universidade Federal de Minais Gerais (Brazil) and Citizens Action and Consumer Group (India) as well as a wide range of civic stakeholders in India, UK and Brazil.

Using the Lefebvrian 'Right to the city' as a framework, the network research method aimed to address problems of lack of inclusion of marginalised groups in smart infrastructure projects. Creatively addressing these challenges involved a process of mapping and prototyping open source technologies that can be used by community groups. From initial participatory mapping activities in India, Brazil and UK, we have developed the 'Smart Cities Demo Toolkit'. This comprises a series of open source demo and smart technology prototypes that enable citizen participation in smart city projects. As part of a range of engagement activities the toolkit has been shared with the public at the V&A Hack the City event at the Digital Design Weekend and with secondary schools and community groups in London to help them use smart city technologies in their own neighbourhoods and communities.

Using Design to Rethink the Policy Process

Anna Whicher
Cardiff Metropolitan University

'People Powering Policy' was a two-year project funded by the Arts and Humanities Research Council (AHRC) to explore if, where and how design might contribute to the policy process. At the intersection between theory and practice on 'design' and 'policy', there is small but expanding knowledge base on the concept of 'design for policy'. Design for policy is a relatively recent phenomenon, rising out of the cross-fertilisation and interdisciplinarity of a variety of design domains including, but not limited to, service design, participatory design, design thinking and co-design.

Our hyper-globalised, hyper-connected world creates challenges at multiple levels of governances – local, regional, national and supranational – and there is a drive to take decision-making closer to citizens. Policy-making in the UK is prescribed by HM Treasury's ROAMEF model; however, in this policy cycle public engagement is not mandatory until the third stage.

As such, traditional policy processes are changing.

Government teams using design for policy are slowly adapting entrenched policy processes from inside the machinery of government and their promulgation has been rapid. A Design for Policy Model and a toolkit, called Design for Policy PROMPT, have been iteratively developed, tested and validated as part of this project. The model and tools have been co-designed in 21 workshops involving 531 civil servants from local, regional, national and overseas governments.

They have also been applied to four policy projects with HMRC Policy Lab, Northern Ireland Policy Lab, Financial Conduct Authority's Behavioural Insights and Design Team and the Welsh Government's Permanent Secretary's Group.

Design for Policy can add value at all stages of the policy cycle, particularly in the early discover phases for understanding the policy challenges from the user perspective and involving citizens in iteratively developing and prototyping policy concepts.

Text Illuminations

**Nela Milic,
Denisa Kostovicova,
Ivor Sokolic
& Tom Paskhalis**
London College of
Communication, UAL

This installation is an interactive representation of a search for the meaning of reconciliation after mass atrocity. It is a product of the AHRC-funded research project 'Art and Reconciliation: Conflict, Culture and Community', a partnership between 3 universities: King's College London, London School of Economics (LSE) and the University of the Arts London (UAL). The artwork is a response to text mining in Balkan languages conducted by the LSE team. The artist and the political scientists joined to discuss the process of interdisciplinary collaboration to convert quantitative text analysis into a designed object. Milic conducted research about the representations of the word 'reconciliation' in Croatian, Serbian and Bosnian languages.

This enquiry led her to the laser cutting technique with Perspex which she has been experimenting with for creating her art piece.
Milic created a word game that includes acrylic letters contained in the word 'reconciliation'. The letters are suspended in a specially constructed dark room, they can be moved up and down, and their various combinations form different words, such as nation, coalition, creation, NATO, etc. Some words also transition from one language into another. For example, 'rat' means war in Serbian-Bosnian-Croatian languages. Words can also be faded in and out with a torch that is provided. It tackles the problem with data visualization that is often expected from artists and designers in the process of beautifying research outputs of scientists. The work is a different response to scientific research as it reflects on it whilst in the process. It demonstrates change in the modus of interdisciplinary collaboration and explores how 'reconciliation' discourse can change through design. 'Text Illuminations' gives new prominence to the words and their meanings and the suspension of words in a three-dimensional space – that mimics the method in a palpable way. This design research engages with a raft of socio-political processes and opens up learning across disciplines.

Body-led Participative Social Design in Youth Changemaker Settings

Claire van Rhyn
Royal College of Art

Reports released by the IPCC and IPBES on the threats of irretrievable climate and ecosystems collapse within the next decade have brought our relationship with near future certainty into the spotlight. In response, a groundswell of public demand for systems change has been catalysed across all sectors and social domains. This is pertinently illustrated in education, where globally a growing number of young people are physically stepping out of school and into real-world activism.

Through an applied social design approach, this research develops participative activities which aim to support systems transition initiatives in youth changemaker settings. The project proposes the body as a crucial modality for both communicating and interacting with social systems. By integrating insights from choreography and dance improvisation with participatory design practices, the research regards the body as a primary design tool. By adapting choreographic and improvisational exercises through a series of iterative prototyping workshops, the research develops a toolkit of body-led participative design practices called Collaborative Improvisation (CI).

The CI practices are currently being trialed in case studies, both inside and outside of formal schooling. The research aims to test the efficacy of CI as a platform for prototyping systems transition initiatives. It further seeks to understand if CI might support the development of 'literacies' which lead to active participation in the co-creation of shared futures. The CI practices aim to support a community in mapping the current realities of their group dynamic through a series of semi-structured collaborative and improvisational activities. By harnessing the body as an investigatory tool that is sensitive to the tacit systems of community interaction, the CI practices refine a shared awareness of the group 'body' and draw attention to emerging realities. It creates a context for the social system to sense and see itself, which is key to systems transformation.

Redesigning the Primary School Chair

Jackie Lightfoot
University of Brighton

Despite a wealth of ergonomic evidence on the physical issues children have with using poorly designed classroom furniture, in the UK designs have remained largely unchanged since the 1970s. The classroom chair is an important element in the material culture of schools. It is a physical connection between a child and his or her classroom environment. Yet, a typical school chair in use today is based on a design for low-cost manufacturing originating in the 1950s.

A well-designed chair should support an individual in carrying out a particular task. However, instead of affording young children the appropriate support that they need for table-based activities, typical primary school chair designs encourage children to sit back and away from their work. Consequently, to be able to see and reach their work, children have to adopt unnatural postures that over time could damage their physical wellbeing. A new type of primary school chair is proposed that is designed with and for young children, to support their natural good posture and healthy inclination to move.

As the child moves toward their work the seat tilts with them helping to maintain their natural spinal curvature. This is a versatile design for 21st century education, which can be used sitting forwards at a desk or back-to-front as a stand-alone workstation.

This research places children and teachers at the heart of investigations into school chair design. The aim is to understand their real, physical and task-based, needs and to develop solutions that support those needs. Participatory and cross-disciplinary, the research incorporates human-centred design practice with applied ergonomic principles in working primary school environments. Design research presented here is drawn from PhD field studies (University of Brighton, AHRC funded), MA product design research (Central St Martins) and subsequent user trials (Studio 93 Limited).

Can't Wait To Learn

**David Swann,
Kate Radford,
Laura Miller &
Kirsten Simonsen**
Sheffield Hallam University

Article 28 of the UN Convention on the Rights of the Child states that every child has the right to a formal education. In Sudan, over 2 million internally displaced persons and nearly 1 million asylum seekers and refugees are being hosted. 61-65% of these individuals are children, and approximatively 1.7 million are school age children.

In 2011, War Child Holland instigated the 'Can't Wait to Learn' programme (CWTL) to develop culturally sensitive educational games for children who have never seen a teacher as a result of armed conflict. A scaled trail phase in Sudan (2014-2015) identified an unmet user need. The absence of a traditional classroom and furniture in rural Sudan compelled young e-learners to use their tablet devices for prolonged periods while floor sitting. This research study in conjunction with War Child (2016 to present) investigates the performance requirements for a novel digital tablet desk (DTD) to address the ergonomic issues associated with prolonged floor-sitting/tablet use. The primary objective of the research was, (1) to co-develop with end users a CWTL:DTD that improves comfort and posture, (2) to adopt a reductive approach to design, (3) to determine a production specification to ensure local manufacturers conformed with essential technical, performance and quality requirements. In conjunction with Sudanese Ministry of Education, War Child's scale-up pilot in Kasalla provided an opportunity to test with young learners and CWTL facilitators: preferences for single or dual desks, alternative seating configurations and options for securing tablet devices. The findings from this research project will determine an optimal solution that is sympathetic to the environmental conditions found in rural Sudan and challenges associated with its manufacture by a low-skilled workforce. The research is now entering a second phase to support War Child's ambitious scale-up plans to reach 170,000 children in Sudan, Chad and Uganda by 2020.

Kos: Material Witnesses

David Swann
Sheffield Hallam University

This research project builds upon a previous collaboration with Kos-Solidarity (2015) to repurpose abandoned life jackets into a trio of refugee products, i.e. The LifeHacket Trio. 'Kos: Material Witnesses' investigates the activities of volunteer group Kos-Solidarity, the operational challenges they faced and the improvised solutions they created to deliver daily humanitarian care to 1000 refugees. The Summer 2015 witnessed the mass migration to Europe with 1 million people making the perilous journey via the Greek Islands. The small island of Kos became a frontline destination with 18,600 arriving in a six-month period; increasing the island population by 62%. With no official reception facilities in place at the time, volunteer groups such as Kos-Solidarity emerged to provide improvised frontline aid, food and clothing. Until this investigation, no comprehensive study specifically related to the humanitarian response in Kos had been undertaken. Fieldwork trips (2016-2018) recorded refugee sites of importance and led to the discovery of a little known site adjacent to the official Reception and Information Centre in Pyli. The work has preserved over 90 refugee artefacts. This collection has grown in significance with successive trips witnessing the gradual disappearance of all of occupation evidence due to the tourist economy. Acting as material witnesses, object-based interviews conducted with Kos-Solidarity volunteers captured their oral testimonies. Freedom of information requests to European Border & Coast Guard Agency has resulted in the production of dedicated Kos migratory database that chronicles migratory flows since 2014: arrivals, refugee numbers and mainland departures. The work has resulted in a series of interrelated outputs with research findings informing the development of humanitarian innovations that respond to the improvised practices and behaviours of refugees and volunteers. In 2016, Kos-Solidarity and its volunteers were nominated along with 16 other Greek volunteer groups for the Nobel Peace Prize in recognition of their humanitarian work.

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SheltAir

Gregory Quinn
University of Bath

This project takes the simple and novel idea of pneumatically erecting elastic gridshells and develops it to fruition in a concise, logical and innovative way in which the narrative recounts a successful example of design through research.
The work presented here proves that the pneumatic erection of elastic gridshells is not only feasible but offers many advantages (such as speed of erection, structural robustness and architectural qualities) over existing shelters for humanitarian, event and architectural applications.
The first 14m span demonstrator was designed as a summer event shelter whereas the second 10m span demonstrator was designed as a multi-family disaster-relief shelter specifically for the extreme weather conditions and usage requirements of the Azraq refugee camp in Jordan.
Incremental improvements to the design of these prototypes saw the assembly time reduce from 5 days to just 8 hours (of which only 25 minutes is the inflation), demonstrating both the viability of the method and the impact of good design.
The novel design in this project takes inspiration from Bedouin dwellings and insists that disaster-relief shelters need not be, in fact must not be, overly utilitarian in their design as they provide not only environmental shelter but crucially are places where the emotional healing of suffering people can begin. Feedback from residents of the Azraq camp reveal that there is significant attraction to this biomimetic design, particularly from women.
The importance of large shelters for medical treatment, social convalescence and religious gatherings in refugee or disaster-stricken areas is largely neglected due to the necessary and immediate focus on smaller family dwellings but also due to the cost, time, complexity and energy demands associated with the construction of larger shelters. The system presented here offers an exciting solution to these challenges as well.

NOTBAD

**Richard Beckett,
Sean Nair &
Carolina Ramirez-
Figueroa**
The Bartlett School of
Architecture, UCL

'NOTBAD' (Niches for Organic Territories in Bio Augmented Design) is an interdisciplinary research project that brings together a team with expertise in architecture, microbiology and antimicrobial resistance. The project explores a novel approach towards preventing the spread of antimicrobial resistance (AMR) in the built environment by reversing the notion of sterilisation and encouraging the growth of other benign and/or beneficial microbes that serve to outcompete AMR microbes. The medical community understands that not all microbes are bad and that certain microbes play a beneficial role within the body in relation to our health and immune development. It is evident that overprescribing antibiotics can lead to the killing of benign and/or beneficial microbes within the body removing competition and thereby allowing antimicrobial resistant microbes to proliferate or colonise the body.

Analogically, these principles are true for microbes within buildings – the so-called built environment microbiome. However, to date, a similar shift in opinion has not occurred amongst architects and designers where a preference for cleanliness still drives a 'kill-all' mentality towards the presence of microbes in buildings. This project is investigating an alternative, pro-microbial design paradigm for a living architecture that purposely grows benign bacteria within the building walls and surfaces that serve to prevent the spread of antimicrobial resistant pathogens via mechanisms of bacterial competition.

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1. Street   2. Front garden   3. House
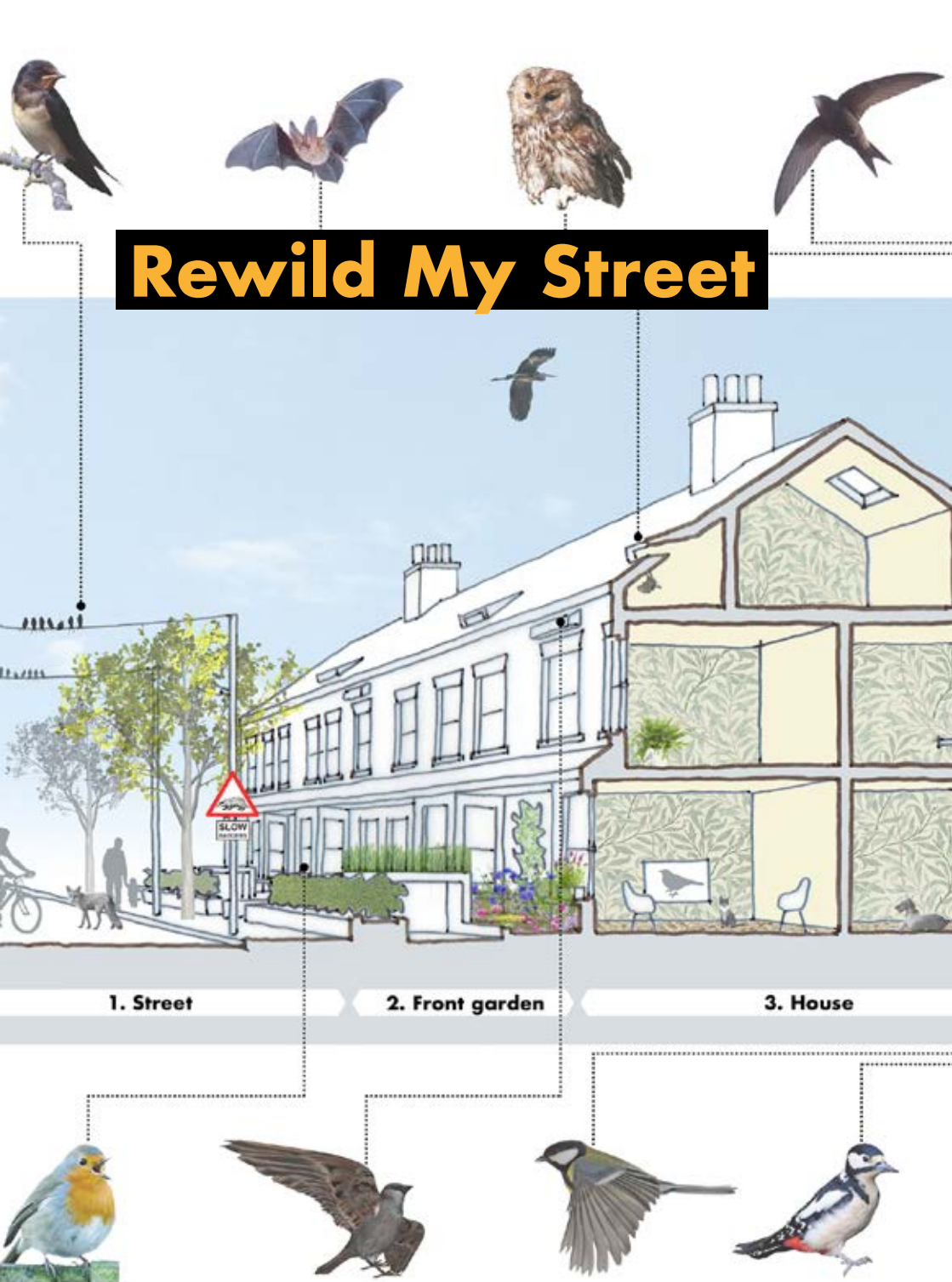
Rewild My Street

**Siân Moxon,
Viktoria Fenyes
& Jon Moxon**

The Cass School of Art,
Architecture and Design,
London Metropolitan
University

Rewild My Street is a design-led campaign to inspire Londoners to adapt their homes, gardens and streets for wildlife. It seeks to reverse the alarming trends of biodiversity decline and loss of urban greenspace, while promoting city residents' health and wellbeing through contact with nature.

London loses the equivalent of 2.5 Hyde Parks per year as residents pave over front gardens, fell trees and lay artificial back lawns. This significantly impairs the habitat value of streets, at a time when over half of UK species are in decline. With gardens covering a quarter of London and connecting other green spaces, educating people about their importance for wildlife could make a real difference.

'Rewild My Street' uses aspirational vision drawings that show a typical Victorian terraced street transformed for wildlife. These are produced by following the standard architectural design process used in practice as a methodology. The drawings are shared with the public in the rewildmystreet.org website, which forms a design toolkit, recommending off-the-shelf products and step-by-step activities to attract wildlife, and expert information on urban species and habitats to highlight the value of these actions. The design-research approach brings new insights to conservation guidance, including street-scale thinking, sensitive integration with an urban context and elegant product specification.

The project supports the Mayor's target to increase greenspace in the capital, following its inauguration as the world's first National Park City. Greening cities has wider sustainability benefits, including mitigating air pollution, flood risk and overheating. With current initiatives prioritising new buildings and public spaces, the project offers a new model for implementing policy and engaging communities that will enable the creation of a global network of biodiverse, sustainable national park cities.

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Fashion Alternatives to Fur and Exotic Animal Materials

**Naomi Bailey-Cooper,
Jane Harris,
Simon Thorogood
& Edwina Ehrman**

London College of Fashion, UAL

Animal products including fur, feathers and exotic skins are problematic materials (ethically and socially), yet they remain popular as decorative embellishments in contemporary fashion. Industry has provided a range of engineered imitation of animal fur and exotic skins using other resources. However, few explore the deeper appeals and associations of high-end animal products, applying these qualities to form alternative embellishments.

This research advances knowledge within textile design practice by identifying key motivators for the application of fur and exotic animal materials as decoration. Furthermore, it applies that knowledge in the design and development of embellishments that test alternative more ethically, socially responsible materials and methods.

This is achieved through engaging industry associated with the decorative use of fur and exotic animal materials in fashion, and via the discovery of historic artefacts in the Victoria & Albert Museum that applied fur and exotic animal materials in popular fashion. The generation of textile embellishments is explored through three practice projects developing experimental techniques and was further inspired by a residency in the Amazon Rainforest to record exotic animal species.

A reflective practice approach enables an understanding of fur and exotic materials in terms of tactility and emotive responses, providing new insight into methods of undertaking novel textile design practice. The design of textile embellishment artefacts undergoes evaluation to determine whether it is possible to achieve similar responses to that generally elicited by the use of exotic materials as decorative embellishment.

The practice research has been disseminated in public spaces including in the 'Fashioned from Nature' exhibition at the Victoria & Albert Museum and the Natural History Museum of Denmark (2018-2019).
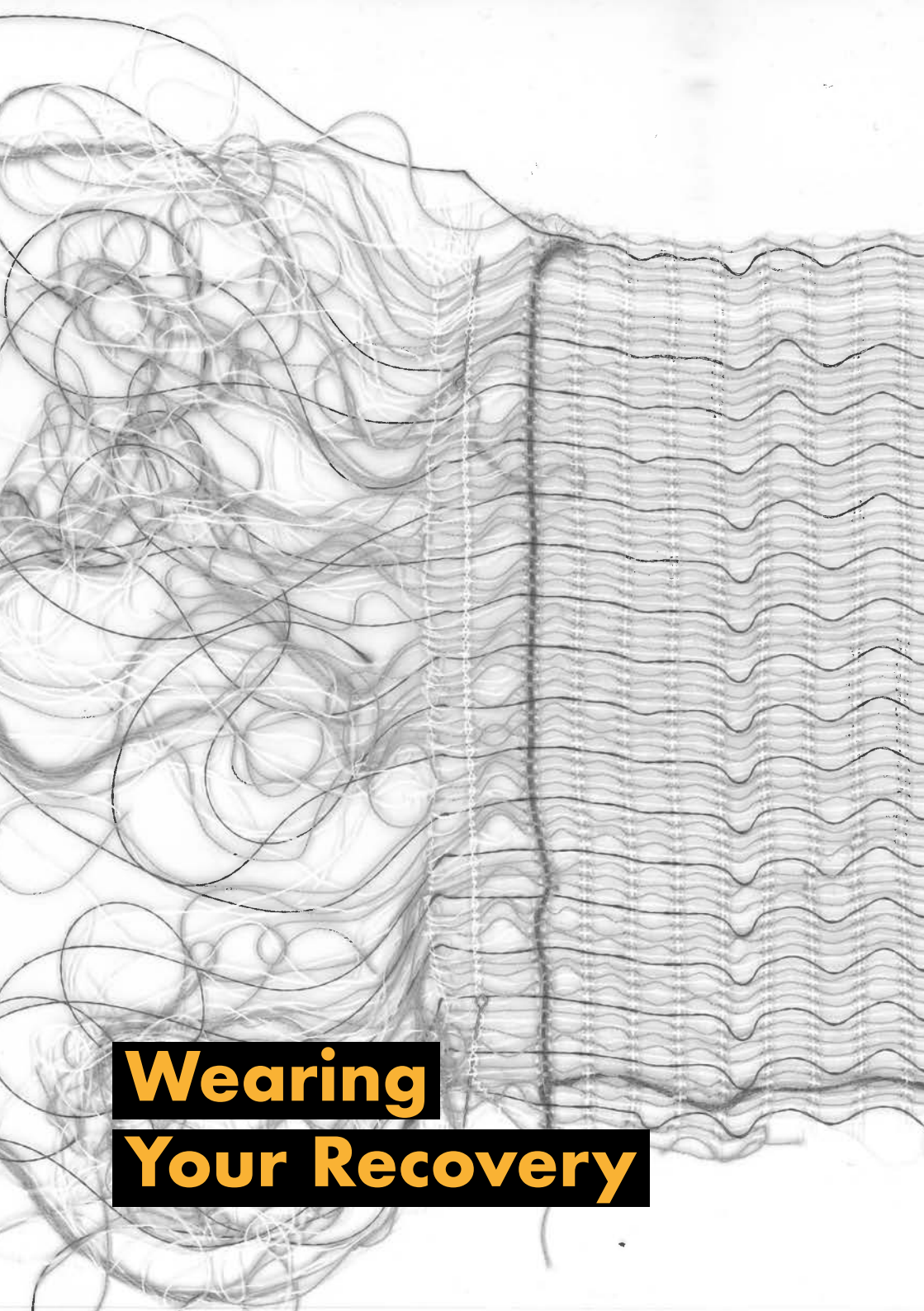
Laura Salisbury
Helen Hamlyn Centre for Design, RCA

We use clothing to highlight, erase, identify and even 'correct' parts of our bodies by slimming, sculpting or shaping. But what happens when our bodies don't function as they should 'normally' do? This project asks how garments can build on their current qualities which impact behavior, mood and function of the body, to re-question and reposition some of the major issues with upper limb stroke rehabilitation to date; specifically motor training of the upper limb. When stroke disrupts the ability to use our finer motor control within our hands, daily activities which enable us to live our lives become affected. Clinicians are acknowledging the importance of self-administered care saying 'it's not what happens when we are there but what happens when we are not there [that is more important]' (Kings, 2017) because the requirements for consistent rehabilitation don't fit into the frequency or limits in resources of in-clinic physiotherapy or occupational therapy sessions. Yet patients are having trouble self-administering rehabilitation, often having to prioritize training over other aspects of their life which can affect mood. Surely a quality of life should not be detracted from in order to get 'better', especially when recovery can take many months or even years.

Using a materials approach in research through design as a particular way of thinking (Frayling, 2015) and by thinking through the making process (Ingold, 2017), 'Wearing Your Recovery' presents a response to work conducted concresently and directly with stroke survivors and 'caregivers' to offer a post-critique of the implications and opportunities of using textiles as platforms for care. Samples presented examine the difference between the role of 'care-provider' and the use of objects as 'platforms for care'. By envisaging textiles as 'second skins', the internal self becomes extended beyond our own form and into that of another non-human form, thus disrupting the course of recovery.

Wearing Your Recovery

Out on a Limb

**Lionel T Dean,
Jennifer Loy,
Hienrich Grimsehl,
Jens Els,
Nic Minnaar &
Philip van der Walt**
De Montfort University

There have been huge advances in the engineering of prosthetic limbs in recent decades and, in sports at least, a move away from the disguise of a false limb to almost a celebration of technology. A parasport aesthetic does not suit everyone however; gender neutral designs with heavy emphasis on robust engineering do little for the confidence of younger, potentially image conscious amputees. Digital technologies such as scanning and 3D printing (additive manufacturing) are starting to impact the design of products for health and wellbeing as they allow for the customisation of medical products. Products that are intimately related to the human body such as hearing aids and limb prosthetics can be precisely matched to individual geometries. Yet the implications of the use of these technologies for the development of products go far beyond fit and function. Rather, they have the potential to redesign the relationship between the person and the object. Out on a Limb explores this potential through a practical example of design-led research, where the designer deliberately challenges the conventional approach to designing lower-limb prosthetics for women, and instead embraces the narrative as a starting point for the design of a character driven product outcome.

A fully functional prosthesis was created for an above the knee lower limb amputee in Johannesburg South Africa. The structure of the device was developed using the computational design techniques of topological optimisation and virtual prototyping before being printed directly in titanium ti64. The flexibility of digital design and manufacturing technologies allowed a custom made solution precisely matched to the user and their needs. Beyond this it allowed the user to engage the creative process and introduce elements of decorative design that carried personal significance.

Design to Support the Transition Towards Self-Management

Teksin Kopanoglu, Katie Beverley, Dominic Eggbeer & Andrew Walters

Cardiff Metropolitan University

This project investigates how we might design products and systems to support people with chronic conditions in their transition towards self-management. This has been done by focusing on the experience of people living with lymphoedema. Lymphoedema is a chronic condition that causes swelling. This swelling requires cumbersome daily management to reduce the likelihood of progression and complications. Consistent practice of lymphoedema self-management was found to be low. Even though self-management is a dynamic and transitional process, how to design to support that transition is not well understood. Current support products mostly consider patient experience as one-off and focus on information provision. In this research, a user-centered design approach to explore the needs of people with lymphoedema was developed. Scenario-based probes were used to envision alternative futures with the interviewees having lymphoedema. The components

and the stages (novice, experimental and expert) of the transition to self-management were characterised as a framework. To support individuals at the experimental stage, a cultural probe in the form of a reflective journal (My-Lymphy-Diary) was developed. During a workshop, participants made a self-measuring tool (Wrap-to-Measure) to use while filling their journal. The framework was formatively evaluated via this cultural probe with people living with lymphoedema, and with healthcare professionals via persona journeys. The user-centered approach adopted provided insights for addressing stage-specific needs. At the novice stage, psychological and social support should be prioritised, and overloading people with information should be avoided. They should, instead, be gradually supported towards expertise in order to develop into proactive problem solvers who observe, adapt and integrate strategies into their everyday life. Self-management support systems should facilitate active learning and provide tailored support according to the stage of the users. This study intends to contribute to change in design focus towards 'patient transition', across a wide spectrum of chronic health conditions.

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XHealthLab: Designing for Healthcare in Space

Stephanie Pau
Royal College of Art

Living in a society with increasing short-term view and polarisation, it is important to develop collective long-term views. Making solutions will keep us busy and productive, but it is being able to identify preferable futures and direct our efforts accordingly that will improve humanity. Especially in a resource-constrained context while expecting significant shifts in demographics - healthcare in space is an extreme example. Space agencies, innovation offices and health policymakers already create visions, often based on trends known to experts – a defensible way to generate visions of futures. Present knowledge is extremely valuable but not absolute. As we look further into the horizon (long-term visions) or into contexts with more unknowns, defensible ways of generating futures become less defensible. This research project explores the process of generating alternative futures using imagination and tacit knowledge. Instead of being the vision maker, this practice is about creating design games and 'stages' and props for design improvs to facilitate participants to envision futures

of healthcare in space. Through a series of experimentation with participatory speculative design of various formats (design fiction, games, improvs) in twelve activities (e.g. workshops), the researcher studied the process of design-by-people and the relationship between imagination and expert knowledge. XHealth Lab is an interactive exhibition created to disseminate and evolve this research. Visitors are invited to engage in a foresight generation exercise using the stage and props created based on research insights. XHealth Lab evolves as the practice evolves. It is a circular way to create and disseminate design research methods for foresight generation.

The Future of Government 2030+

Lara Salinas
London College of Communication, UAL

The Future of Government 2030+ is a project carried out by the European Commission's Joint Research Centre (JRC) in collaboration with the Directorate General for Communication Networks, Content and Technology (DG CNECT). The project aimed at exploring how the future relationship among citizens, businesses and governments would evolve in light of emerging digital technologies and services, and to stimulate EU-wide debate on possible, plausible and desirable future models of government and of public service provision. The project adopted a novel participatory approach that combined citizen engagement, foresight and design, whereby six European design schools were commissioned to prototype design concepts for future models of government and public services provision. Each of the design schools envisioned their contribution to the project based on their particular context, capabilities and expertise on diverse design disciplines. The team at the University of the Arts London explored disciplinary configurations for participatory future making, combining design for services, speculative design and foresight, in collaboration between postgraduate students, design scholars and public servants. The team made a number of future policy/service objects as material representations of possible futures that enable strategic conversations in the present about future uncertainties. 'Social Care Service Delivery' envisions a future government that acts as an insurance company and collaborate with businesses to prevent citizens' claims. In order to access Social Care services for free when needed, every citizen pays a monthly tax, according to their assessed level of risk. The government and businesses team up to provide citizens with tailored recommendations to maintain healthy lifestyles and reduce their risk scores. 'The Citizenship Act' presents a future scenario where public participation is an intrinsic part of the education system, and all citizens receive an income to spend part of their time as policy makers. Citizens are organised by local councillors into competence clusters, in order to fully represent key stakeholder needs fairly and efficiently.

GoFit4Fun

Remi Bec
Sheffield Hallam University

GoFit4Fun CIC is a social enterprise delivering services using (tangible) games to promote physical activity and reduce social exclusion. GoFit4Fun is the culmination of 12 years of an iterative cycle of research and implementation. Through GoFit4Fun, players create an avatar that is used to play a series of linked games. 'Boost Up' is our latest game and is composed of a card and board game. 'Boost up' was evaluated over 6 weeks with 15 participants from a secondary school in Sheffield (UK). Attendance rate being high and feedback positive, this rigorous process of research led to developing games which are now part of a wider service delivery provided by GoFit4Fun. A pilot study with 30 participants selected in 2 local primary schools will be conducted from October 2019 to January 2020.

The current suite of games contains multiple forms of knowledge, due in part to the application of creative co-production methods that are sensitive to context and unique stakeholder needs. Therefore to develop the next phase of the work and understand how GoFit4Fun might be used to develop interactions and games within and between communities to move more, further investigation using co-productive approaches are required.

Each output represents a 'keypiece' embodying considerable amount of knowledge. Some can be seen as 'final outcomes' yet they are turning points in the design development process. They are prototypes communicating the knowledge developed until then to different audiences to gain further understanding. They are ultimately part of an iterative process of testing in context with those they were designed with and for.

These keypieces are the development of Boost Up (concept testing and games prototype) and GoFit4Fun (representations of new board game + GoFit4Fun services) - hence the different versions (V1, V2…). Promoting co-creation, games, physical activity and social interactions are the essence behind GoFit4Fun.

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Let's Go Walkeez

Kazz Morohashi
Norwich University of the Arts

What happens if we give a (toy) dog and a camera to a child, then ask them to go and sniff out great things in museums? This study explores how design helps motivate young children and their family to interact, collaborate, gather and share ideas and images of what makes cultural artefacts interesting to them.

Drawing on different design practices ranging from product design to service design and user experience design, this research focuses on the role of museum learning resource in facilitating and capturing human interaction and educational experiences, especially those of family visitors in art museums. Specifically, it looks at a method of collecting child-centered visitor feedback through an exploration tool called 'Go Walkeez'.

'Go Walkeez' involves a toy dog as an active agent to be used in conjunction with a mobile device camera and a passport – an exploration prompt sheet. Families are asked to "take the dog out for a museum walk" and snap photographs, or "sniffie shots" as they are called, of objects they find interesting. The dog and visitor photographs act as an important communication tool to assist families (and museum professionals) to provide qualitative feedback about their museum learning experiences.
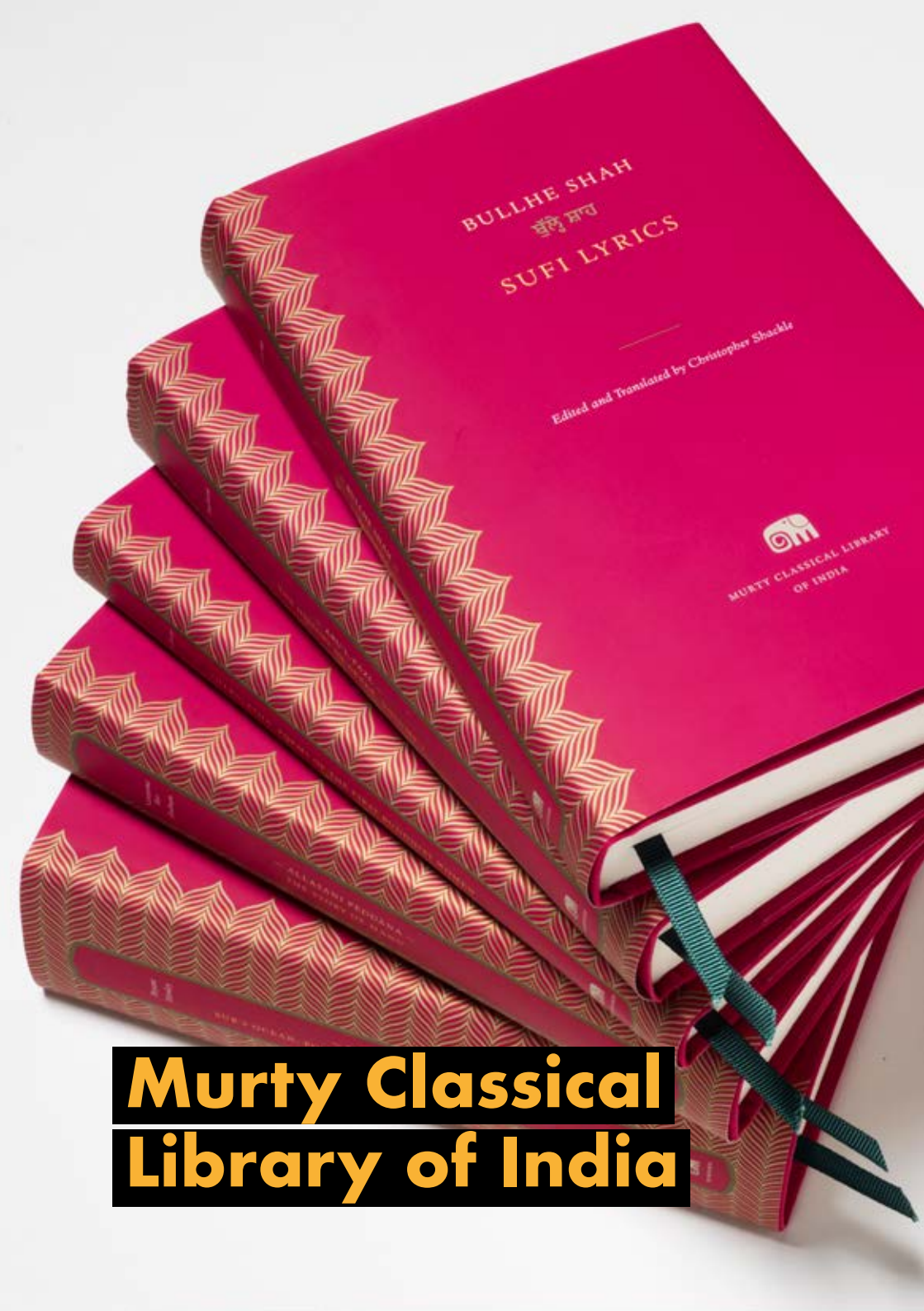
Murty Classical Library of India

Rathna Ramanathan & Guglielmo Rossi
Royal College of Art

Many important classical texts in Indian literature have never reached a global audience; others are becoming unavailable even to Indian readers. This 100-year strategic design research project aims to create an accessible classical library that provides modern translations of important Indian texts available in print and online. Funded by a trust set up by the Indian industrialist Rohan Murty and overseen by Harvard University Press, the research sets out to create a framework for the design of the printed book interiors, digital texts and Indic typography for jacket designs. The typesetting and design of bilingual Indic texts of such range and complexity is unprecedented in modern design practice and poses multiple challenges that were addressed through three lines of enquiry. First, to establish a systematic bilingual book design for English translations of texts in ten different Indian languages and scripts grouped into four categories: North Brahmic (Sanskrit, Hindi, Gujarati, Bengali), South Brahmic (Tamil, Telugu, Malayalam and Kannada), Perso-Arabic (Urdu) and Prakrit (Pali). Second, to accommodate different genres in the template design: poetry, prose, drama etc. Third, to develop an Indic hierarchy and grammar through the application of appropriate typographic rules.

The design is based on historical research and the living traditions of the Indic book, including palm leaf and birch-bark manuscripts and early printed books. Following the intellectual mission of facing-page translations, the page spread is designed so that text and translation reflect each other. The series design is based on the concept of "unity in diversity", celebrating the individuality of each language while bringing them together within a single, cohesive visual design.

The texts are available for the university curriculum in India as well as for the trade market. The background research informs the development of open source guidelines and methods for contemporary Indian typesetting.

Community Maternal Healthcare in Kenya

Mikaela Patrick, Winnie Chelagat, Gulraj Grewal, Thandiwe Chemng'orem, Nowella Lillian, Jackline Amakobbe, Geoffrey Mwai & Geordan Shannon
STEMA, UCL Institute for Global Health

Across Kenya, maternal mortality is high and 75% of deaths are preventable. Orus in East Pokot in Western Kenya is a remote, rural, area with limited access to healthcare and significant maternal and child health burdens, the nearest clinic is 50km away and both infrastructure and terrain present significant barriers to access. As a result, women give birth at home or in the bush with the help of traditional birth attendants and rely on informal health systems. Training, equipment and space to support safer births in the community are needed. The project aimed to reach women in marginalized and rural communities in Kenya through co-designing a space for maternal health. The brief proposed designing a 'manyatta' (the local architectural vernacular) to be

a place where women can access basic antenatal, birthing, and postnatal care. The design research team worked with the community at different scales: meeting the village elders (men) in the traditional baraza, community meeting, to discuss the village history, livelihoods and broader problems; the women, to produce day-in-the-life and birthing stories; the traditional birth attendants and community health volunteers to understand the systems of health challenges; and key stakeholders in a site visit and participatory mapping session. Engaging with the various stakeholders uncovered a more complex design challenge: to design a system of interventions to gradually improve maternal health over time, starting with training and awareness, building trust, providing basic equipment to assist the traditional birth attendants and leading up to providing a space with full support from the community. The research team found that in conditions of such resource-scarcity, a careful approach that would also address the worsening environmental conditions (droughts) and the community's complex relationship with the formal health system would be the most appropriate and resourceful way to 'build' health.

Housing Design for Later Life

**Faye Sedgewick,
Lesley McIntyre,
Rosie Parnell,
Paul Jones**

Northumbria University

Housing has been recognised to play a significant role on an individual's personal well-being and quality of life, particularly impacting upon the increasing ageing population. Housing design is influential in enabling older people to maintain independence, enhance social inclusion and alleviate loneliness. Shaping the future design of housing that supports older people's changing needs is a high priority. This architectural design-led project is a three-stage research inquiry, each impacting upon the consecutive stage. Stage one was an ethnographic study, focused on lessons learnt from the researcher living within a care home environment in the Netherlands. Findings highlighted how cohesion between generations enhanced social connections and the re-design of the care home led to a reduction in loneliness and isolation, whilst improving the well-being and quality of life for residents. Stage two utilised findings from stage one, to design an award-winning research-led architectural project that supports intergenerational living. Stage three is the researcher's current PhD, which has been fuelled by the two previous stages. Evidence has highlighted that there is a current shortfall of knowledge and understanding of the specific relationship between architects and older people when conceptualising, planning, designing and managing age-friendly mainstream housing in the North East of England. This research study aims to (1) provide a detailed insight from an architectural perspective into the agency and process of architects (particularly within the North East of England) when designing mainstream age-friendly housing; (2) determine the key successes and limitations that currently exist for architects when designing age-friendly housing; (3) evaluate the knowledge, methods and guidance used by architectural practitioners; (4) develop a toolkit to support architects during the design process of future age-friendly housing projects.

Empathic Design for People with Multiple Sclerosis

Connor Andrew Gallagher

University of Central Lancashire

Empathic design is an integral part of design and must be applied correctly to obtain the best results. The project is aimed at designing for people with Multiple Sclerosis (MS), making it imperative to meet the intended users of the eventual product. This became more of an integral stage due to the nature of MS, where conditions wildly fluctuate in severity from person-to-person. During the project, it was crucial that the concept stage was halted until all interviews had taken place and the relevant information had been extracted, creating an empathetical understanding of their daily struggles to define their requirements for a piece of mobility equipment and not what their condition solely dictated. After gaining ethical approval and interviewing eight people living with various stages of MS, the text was then transcribed and inputted into NVivo to code and to identify consistent issues. Subsequently, six areas were selected, three using statistical frequency, and the other three based on gut feeling. Although the latter were not high ranking, they were interesting areas which could be identified and developed.

After a refinement process and identification of interesting areas, a single area of new mothers with MS was chosen. The product developed was based around the area of hidden assistance; the PAM pram is designed to offer the support of a mobility walker without showcasing that the user is needing any assistance. With the aid of push assist, the user does not need to exert any extra energy in pushing the pram up an incline, allowing the parent to increase their distance and decrease the probability of becoming deconditioned. Eventually, the pram element will be taken away leaving a functional mobility walker that the user has been using for the last 18 to 24 months, thus reducing anxiety in using the equipment.

Modular Figurine

Silke Hofmann
Helen Hamlyn Centre for
Design, RCA

Breast cancer can be described as a modern epidemic. According to the World Health Organisation, every eighth woman will be diagnosed with invasive breast cancer in her lifetime. Most treatments include a mastectomy, which encompasses the full or partial removal of a breast, nipple and areola. Nearly half of all women undergoing such procedures, will not or cannot immediately reconstruct their breasts after or during surgery and survive the disease initially with a new, one-breasted or none-breasted body. Silke Hofmann's research focuses on the impact of the aesthetics and functionality of post-mastectomy lingerie on the physical and emotional recovery process of breast cancer survivors. To benefit inclusivity, she proposes to rethink the conceptual framework of seasonal fashion industry cycles by disrupting the conventional fashion design processes and including consumer voices at the early stages of garment designing. This approach aims to advance a better understanding and sensitivity towards garment consumers' needs and to fill a neglected gap in existing garment and fashion design knowledge.

Working alongside survivors in facilitated, participatory sessions, Silke deploys fashion design tools based on simplified and stylized fashion design processes. The sketching phase of a conventional fashion design development process captures initial design ideas onto paper. Based on this concept the modular figurine tool facilitates the design of customized, clothed self-portraits by individuals. The tool collects visual data of broader aesthetic and ergonomic garment preferences, such as colours, shapes and decorative ornamentations. The tool also aims to gently introduce participants to a more systematic process of thinking about their garment needs and serves as an incentive to engage garment wearer in rudimentary design processes.

CitySelf Anima

Katarina Dimitrijevic
Goldsmiths, University of London

'KraalD' activism continues to nurture a complex metaspace, self-entangled in design research, waste-centric languaging, craft-making with plastics and plastic pollution visualisations. Praxis is exploring entanglement between stakeholders in "more than human worlds": thinking and making with single-use plastics, representing the anthropocentric commodification and automated plastic waste management habits through nonhuman others stance. Theoretically inspired notions of "designedisposal" tactics are presented through practice works of the 'CitySelf Anima' series (KraalD, 2013). Atelier lights are conversational artefacts which propose design-led critical responses to the planetary plastic pollution challenges. Plastics material mediation is animated via personas of the wild springbok antelope and domesticated cow heads. Nicknamed Boki and Mumu are remade with post-consumer high-density polyethylene, HDPE bottles and polyethylene terephthalate, PET bottle tops. The 'CitySelf Anima' series emphasises a long-lasting toxic element in plastic objects and single-use things. Boki & Mumu revokes the urban jungle totem, positing plastics material aesthetics and praxical "methodological fetishism" embedded in the everyday ritual of consumption and disposal. Boki light series are in the permanent collection for the ETSY, New York headquarters, (KraalD, 2016).

Designedisposal: KraalD is designing from and with plastic disposal only. Designedisposal stands for all plastic things, short-lived as made for single-use, thus designed for the discard.
Methodological fetishism: derives from Bill Brown's "Thing Theory" which is founded "from a methodological point of view, it is the things-in-motion that illuminate their human and social context" (Brown, 2001, p. 6).
More than human worlds: Stands for the nonhuman others sociality in their habitat. The researcher borrows the term from Maria Puig de la Bellacasa's book "Maters of Care: Speculative Ethics in More Than Human Worlds", 2017.

Designing a Sensibility for Sustainable Clothing

**Jodie West,
Clare Saunders,
Fiona Hackney,
Joanie Willett,
Irene Griffin,
Katie Hill &
Anya Barbieri**

University of Exeter

Policy-makers are somewhat baffled about the best way to encourage individuals to engage in pro-environmental behaviour. At the same time, fast fashion has come under the spotlight for its negative environmental and social externalities. The 'S4S: Designing a Sensibility for Sustainable Clothing' project sought to contribute to solving both of these dilemmas. It used collaborative social design to engage around 40 participants in co-creation workshops to make, mend and modify clothes. By providing participants with the three cornerstones of social practice theory – the 'things' (spaces, sewing machines, fabrics, etc.), the 'skills' (lessons) and senses of meaning (intimate discussions with peers) – the project team made a significant impact on the way they think, feel and act in relation to their clothing. Multi-method research tools (surveys, interviews, wardrobe audits, reflective diaries and short reflective videos) have allowed the drawing of conclusions that the participants now take a thoughtful pause before buying new clothes, thinking in particular about the quality of the fabric, and whether they really 'need' the garment. Many claimed to feel guilty for having too many clothes and developed a sense of empathy with garment workers who make clothes on their behalf. They consequently act differently now: buying fewer but better quality garments, and feeling more inclined to make, mend and modify items they already have in their wardrobes. Together with community-based partners, a range of professional consultants/workshop facilitators, film-makers, the participants themselves and the NGO Fashion Revolution, the research team designed this sensibility – thinking, feeling and acting – for more sustainable clothing choices. The project was funded by the Arts and Humanities Council, and was led by academics from the Environment and Sustainability Institute at the University of Exeter and the Wolverhampton Art School at the University of Wolverhampton.

**Laura Wareing,
Elena Gifford,
Paul A. Rodgers,
Nick Dunn**

Imagination, Lancaster
University

'Redesign by the Sea' is a project that has enabled young people aged 16 and 17 living in Morecambe, a seaside town in Lancashire to become 'Festival Co-designers' in a series of design sessions. They worked alongside Morecambe-based creative practice, Deco Publique and PhD design researchers to rethink their hometown as a more attractive place for young people to live, through redesigning aspects of the major annual 'Vintage by the Sea' Festival. Engaging local young people in shaping the festival was an opportunity to grow the festival, as well as to ensure it becomes more sustainable and reflects Morecambe as a place. Morecambe, like many seaside towns in the United Kingdom, has a number of social and economic challenges. Young people living in coastal areas in the United Kingdom face barriers to education and employment opportunities, posing a threat to the number of young people living in seaside communities in the future. The sessions were designed to provide an opportunity to learn about what it is like to work in an inspirational creative business in Morecambe, as well as to develop creative, business and collaboration skills, voice opinions, design new ideas and play an active role in innovative placemaking practice. The group was guided through a design process, which was supported by a variety of designed tools and took place at both school and Lancaster University.

Everyone involved in the process gained something valuable from taking part. All of the young people enjoyed it and wanted to continue developing the ideas. Many reported that it had made them think differently about where they live and about creative work. Deco Publique reported that they will definitely evolve the ideas to become part of future events and festivals and they wish to transfer the co-design approach into some of their other projects.

Redesign by the Sea
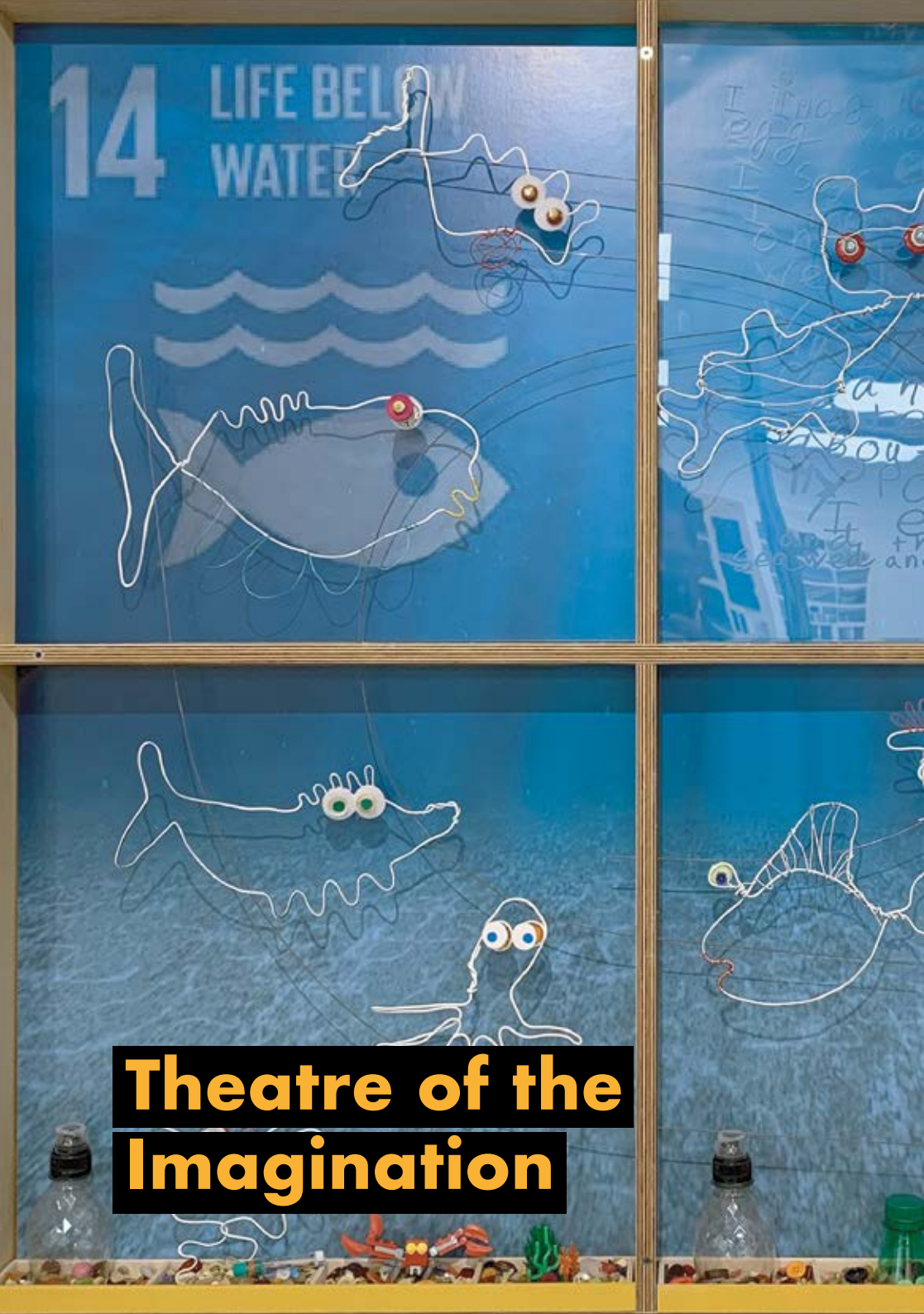
Theatre of the Imagination

**Robert Pulley,
Ashley Hall,
Esther Burkitt
& Clare Brass**

Royal College of Art

'Theatre of the Imagination' sets out to explore how creative practice helps to nurture personal agency and global citizenship in mainstream primary education.The research team transferred signature pedagogies from art and design through a series of workshops designed to cultivate thinking through making.

The workshops enabled the construction and testing of a creative toolkit for social innovation which encourages children to express their vision of what might be possible in the future and to plan small interventions aimed at bringing about change. The research team adopted the UN Sustainable Development Goals as a framework to raise awareness of diversity and to help nurture children, and their teachers as socially aware global citizens. Findings from this doctoral research project suggest that 'Theatre of the Imagination' enhances metacognition and compassion. The toolkit promotes participation across geographic space aimed at accelerating learning in primary education. Workshops enhance personal agency, innovation, and engagement with global learning through discussion and storytelling. A series of constructivist learning design events have produced compelling insights that suggest art and design have the potential to make a positive impact on the development of cognitive and non-cognitive skills in children. Findings arising from these studies raise concerns about government-funded research which suggests there is little evidence that the arts have a positive impact on accelerating learning in primary education. This assertion requires further investigation at a time when such findings are used to direct diminishing funds in schools. Creative skills have the potential to nurture self-regulated learning and self-efficacy in mainstream primary children. These characteristics of metacognition develop a child's confidence and provide greater equality of opportunity with peers from more economically privileged backgrounds.

# Mending the Fabric of the Sites of Collective Memory

Aslihan Caroupapoullé
Kingston University

This practice-based research aims at creating a research-led design strategy encouraging future development and sustainable design within a UNESCO World Heritage Site. The focus of the project is the town of Belper in the Derwent Valley, an area currently under pressure from diverse and conflicting socio-economic forces due to the post-industrial decline of the cotton manufacturing industry. As an example of the pioneering period of the Industrial Revolution, Belper's identity is defined by its overall form and its relationship to the industrial landscape and the broader agricultural landscape. It is essential that these relationships should be definite and recognisable. However, abandonment of large factory buildings and closure of many warehouses and garages have left behind vast, derelict land and a bizarre landscape that needs to be remediated. The hypothesis behind this project is that the new design can recognise, reinforce, and enhance the distinctive characteristics of the historic built environment while upgrading it for the 21st century. The innovative approach here proposed regards the site as a palimpsest, a concept based on alternative urban theories that seek to uncover the 'deep structure' of a place as a foundation for place-specific design. This involves extensive and focused research of the existing layers of the historic built environment and its cultural significance, the natural environment and the social landscape. Knitting together the new and the existing, this research-led design proposal seeks to promote appropriate and viable mixed-use development that repair and upgrade Belper's existing urban grain while recognising the evolving nature of its historic character.
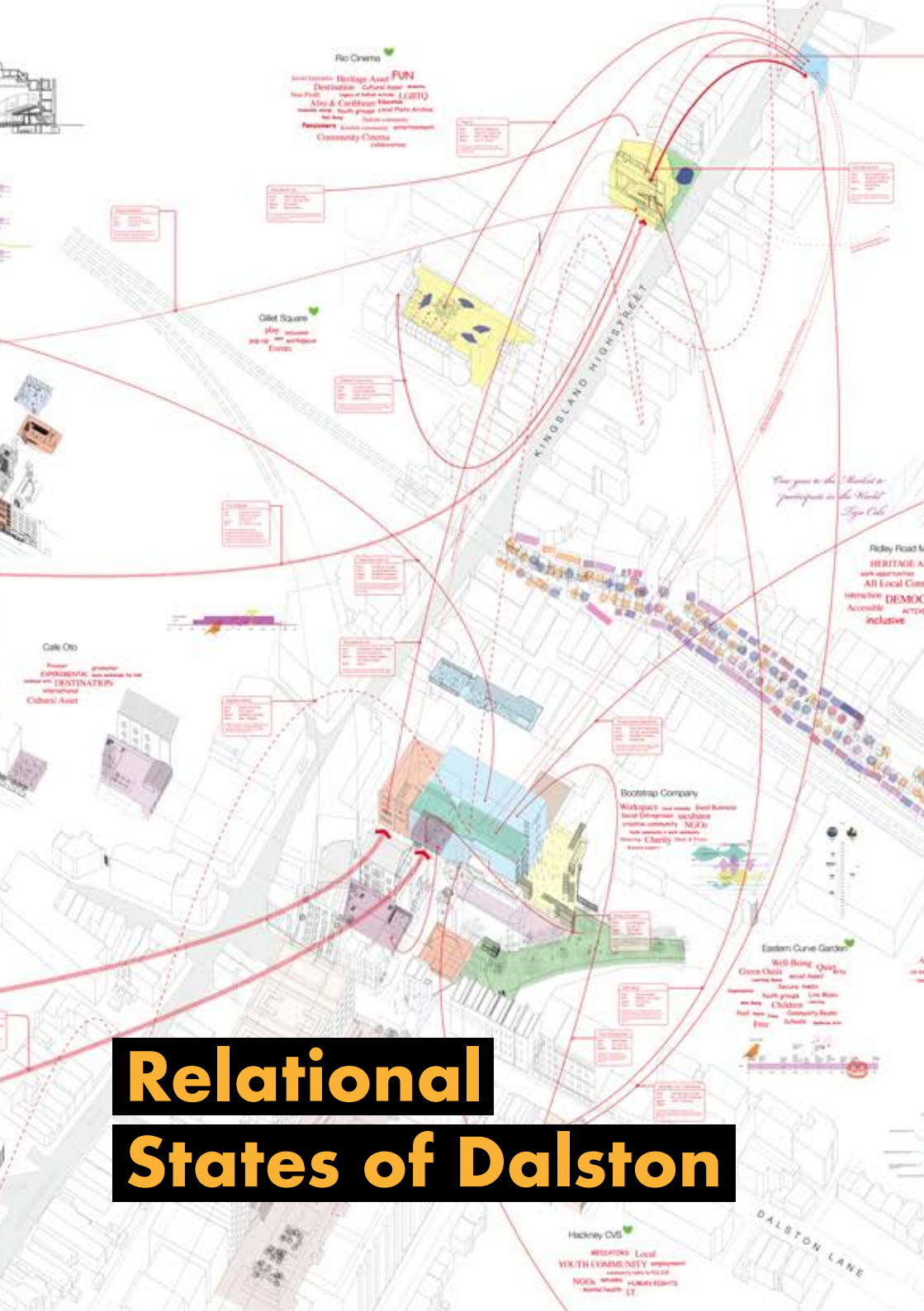
Carsten Jungfer & Fernanda Palmieri

University of East London

Can a collaborative approach to urban design promote knowledge transfer that enhances social and spatial capital for local communities? The research project aims to develop new forms of collaborative architectural and urban design practice by connecting architectural design teaching with Local Authority contexts to establish a live project methodology.

Twenty architecture students of unit A investigated East London's socio-spatial conditions and conflicting modes of spatial production during the 2017-18 academic year. The collective design output formed the basis for a partnership between the London Borough of Hackney (LBH, planning department) and the University of East London (UEL). Working collaboratively, the scope of the research was expanded and defined to create an evidence base to inform LBH's future planning policy currently being developed. The large format drawing of Dalston's socio-spatial context of stakeholder relationships was produced during a two-week drawing workshop under the supervision of principle investigators Carsten Jungfer and Fernanda Palmieri. Thereby, the drawing acts both as primary tool for a dialogue-driven design process and as research outcome itself. It was exhibited at the Print House Gallery in Dalston during autumn 2019 accompanied by a series of consultation events with local stakeholders. Feedback gained was integrated back into the drawing and the research was scaled up further during Spring 2019 with help of students working as co-researchers (supported via the UEL student internship scheme).

Phillip Glanville, the Mayor of Hackney attended a formal presentation event, noting this approach was unique in fostering unconventional knowledge transfer, critically needed in context of public debates relating to social impact of urban development and gentrification.

Relational States of Dalston

The Rooftop Project

Rebecca Taylor
Imagination, Lancaster University

Conceived as a grassroots initiative, 'The Rooftop Project' was motivated by the lack of green space in Manchester's City Centre. Local resident/activist/design researcher, Rebecca Taylor decided to act upon this need and grew curious of how design might be applied and experienced.

'The Rooftop Project' became an open, experimental co-design opportunity. With a lack of space to occupy at street level, a local architect offered an unused, unoccupied 300 sqm rooftop. Occupied by over 200 people, the building housed organisations from across the digital, creative communication, cultural, social action, charity and educational sectors.

The project provided people who occupied the building with an opportunity to participate in the co-design and management of a publicly accessible, outdoor social space. Fondly known as 'a mass collaborative effort', it took 6 months for the grey rooftop to be transformed into a social space where performances, exhibitions and events were programmed by the community.

The process challenged preconceptions of design and the co-design process. Conflicts and tensions were experienced, and key themes emerged such as: how we take care of, lose interest in, and neglect 'green', shared public space; how we struggle with opening up and granting permission of our private spaces for public use; as well as how we grapple with and define glory as we seek to do good.

A longitudinal study, over two years, 'The Rooftop Project became an example of methodologically reframing Research through Design (RtD) as 'living life as inquiry' (a first-person action research approach) through experience-centred, (co)design activism. Experiencing participation in 'The Rooftop Project' illuminated the multi-dimensionality (i.e. the social-spatial-technical/digital-temporal dimensions) of Research through Design. It also demonstrated how important a socially aware version of RtD is as it extends to and influences Organisational Systems, Action Research in Information Systems, urban design, community engagement and architectural practice.

Data Walking

David Hunter
Ravensbourne University London

Data Walking is a research project exploring the potential of walking to gather environmental data and through multiple walks and visualisations build a rich picture of that area. The project examines technology and tools for creative data gathering and experimenting with data visualisation, to create tools, gain insight, and share knowledge.

The project has been through a series of distinct phases and resulted in a number of international workshops and presentations at events and conferences. People who have attended workshops include students, academics, designers, developers, data scientists, environmental scientists, policy makers and town planners involved in smart city initiatives. There has been a variety of outcomes from data sculptures to printed publications. The North Greenwich phase in 2016 resulted in a 96-page report featuring the visualisations of renowned designers, studios, educators and students, as well as practical advice on beginning your own walks or workshops, and tools to try out.

Much of the data, photographs, code and schematics to create your own data gathering tools are shared freely at github. com/DHDPIC/DATA_WALKING Please use the data to create visualisations, artistic responses, and tools for inspiring more creative outcomes using data. The website datawalking.com also contains workshop guides, idea generator, further resources, and more details on the different phases of the project.

The Evolvable Walking Aid Kit

Cara O'Sullivan
University of Liverpool

Over 18% of the global population has moderate, severe or extreme difficulty with walking; as the population continues to grow and age, this number is set to keep rising. Using an unsuitable walking aid can worsen a condition, disrupt healing, or increase the risk of accident or injury. There is hence an increasing need for the design of simpler and cheaper walking aids which can be easily adapted and readily available. This project takes a global perspective on the issues with existing walking aids and the systems for distributing them by conducting ethnographic research, interviews, and co-design processes in two extreme contexts.

Firstly, a Mobility Rehabilitation Centre in rural Peru to capture insights from children in a developing context, and secondly, a Care Home in the UK to capture insights from elderly walking aid users in a developed context. Three core design principles were distilled from this research and guided decision-making throughout the design processes.
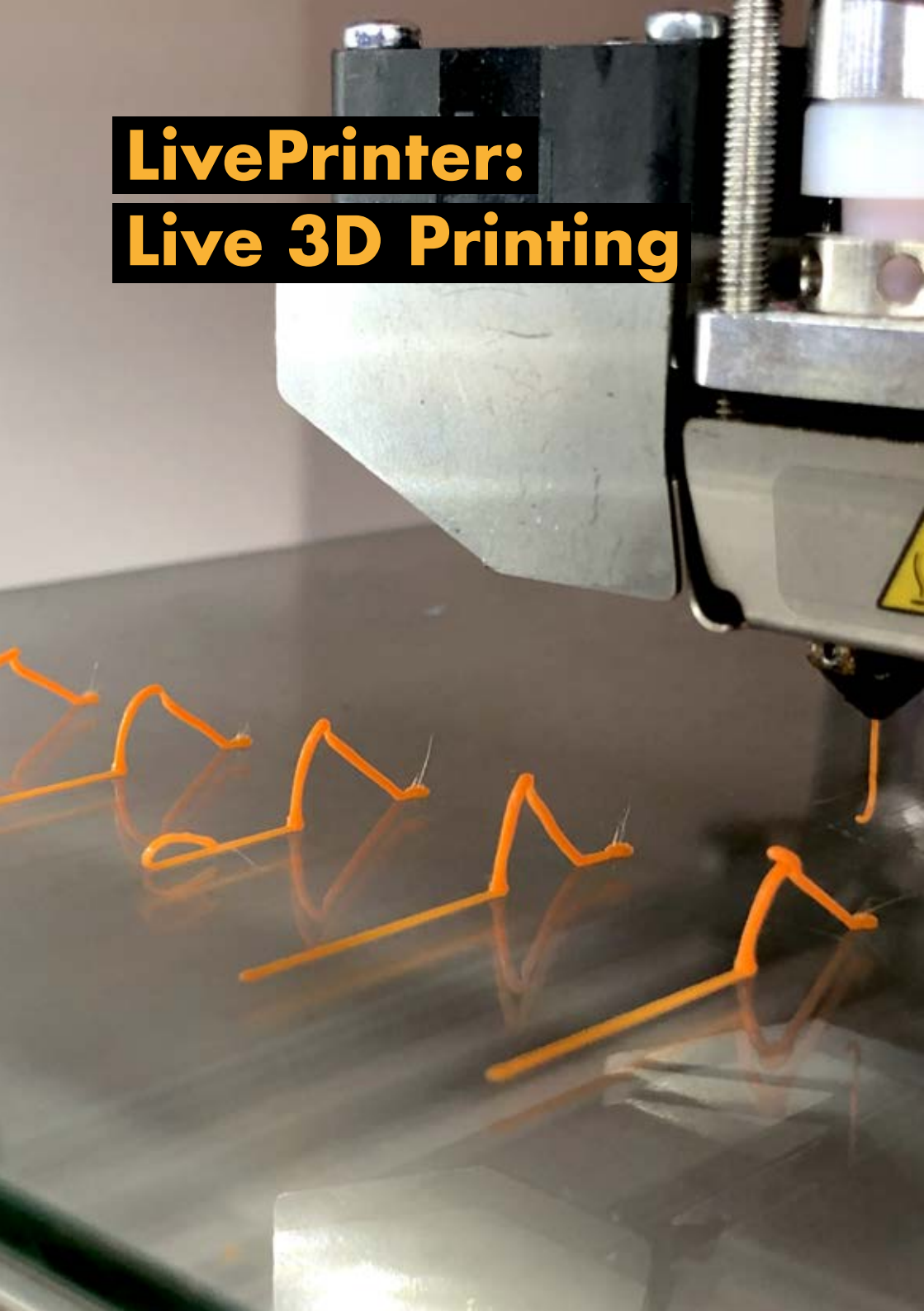
Outcomes highlight the influence of context and culture on the design process, manufacturing choices and overall product accessibility.

The Evolvable Walking Aid concept is a modular range of parts which can be assembled to form a walking stick, crutches, a walking frame, or variations of these aids to offer different levels of support, tailored to the user's specific needs at different stages of their condition. It gives users control and ownership over their care, whilst offering a viable, cost-effective, emotionally durable and sustainable healthcare solution which facilitates the correct long-term support.

By focusing on the case study of the Evolvable Walking Aid Kits, the research project investigates to what extent a modular system which has been designed to incorporate principles of affordability, evolvability and emotional durability can benefit patients. Through this case study, the rationale and potential for application of this concept to a broader context of inclusive design is suggested.

LivePrinter: Live 3D Printing

Evan Raskob
Goldsmiths, University of London

This project aims at developing an open, interactively programmed 3D printing system for live computational making. It explores the role of improvisation and intuition in design and making new forms for automated manufacturing. Current processes for 3D printing place the artist and designer at a difficult distance from the physical process of making. There is no space for live improvisation and experimentation, especially with key properties that directly affect printing materials like temperature and print speeds. This new system extends digital printing and CNC machining into the realm of performance and also has potential in design and science pedagogy and materials science. It also might spur us to consider how we as humans might have a more active part to play with automated manufacturing. LivePrinter has already been used to create live musical performances with 3D printers and generative works of art.

**Andrew Johnson
& Matthew Marshall**
Loughborough University

Hybrid Additive Manufactured-Aramid-fibre Body Armour

Body armour is essential in protecting police and military personnel in situations where they may be exposed to a range of life-endangering threats. Whilst the protective performance of these articles has progressed since their introduction, users of such armour often report of their ill-fitting and uncomfortable nature. This, combined with the typical high-weight and low breathability of Polycarbonate and aramid-based armour, at best results in impaired performance such as reduced running speeds or operational manoeuvrability, and at worst can lead to physiological effects including nerve damage and severe musculoskeletal injuries. By utilising the design and manufacturing freedoms offered by Additive Manufacturing (3D Printing) technologies, coupled with the enhanced protective performance and maneuverability of existing aramid-based armour, this project established the world's first hybrid Additive Manufactured-Aramid-fibre body armour. The developed protective solutions are capable of providing protection to internationally recognised UK Home Office stab and ballistic body armour standards. Knife resistance is achieved to 24 Joules of impact energy (KR1), and enhanced ballistic protection is achieved against a 9mm calibre full metal jacket ballistic round travelling at 365 m/s-1 (HO1).

This project epitomises the importance of interplay between key design, mechanical, and material engineering activities through meaningful and responsible design for additive manufacture research.

Smart Non-woven Textiles for Adaptive Insulation
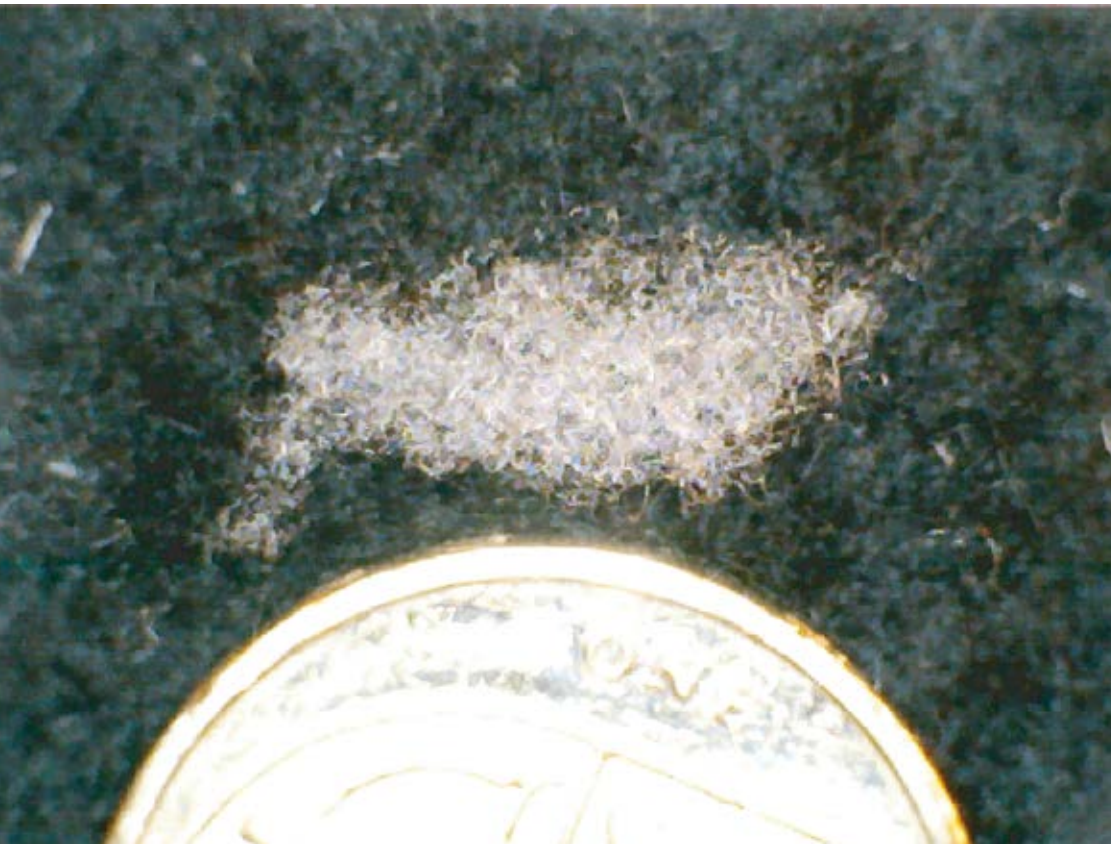
Veronika Kapsali

London College of Fashion, UAL

By 2030 people aged 60 years and over globally will rise to 1.4 billion (UN, 2015). The creative industries are set to play a critical role in the implementation of government policy in preparation for the demographic shift bought about by a growing ageing population. Strategic priorities, on a global scale, seek to advance health care systems and improve social, physical, technological connectivity. The role of design, in its broadest sense, is positioned to ensure capitalisation of opportunities from new technologies by addressing barriers such as uptake, sensitivity and privacy. Within this context, design of the build environment is positioned to maximise physical mobility and lead to increased activity levels, better health and quality of life through the intersection of human-centred design approaches and advances in material/digital technologies. This project widens this proposition to include garment and fashion design. The aim is to create a new class of smart non-woven textile, to enhance the experience of physical activity by addressing the issue of physiological discomfort from the buildup of microclimate moisture in individuals with limited mobility due to age and/or disability. Thermal and airflow properties of conventional clothing systems rely on the wearer for adjustment through the addition/removal of layers. This project will develop a non-woven textile capable of autonomous, physical adaptation of thermal and airflow resistance using InotekTM, a biomimetic hygroscopic staple fibre which reversibly alter its length in response to levels of moisture vapour concentration in the environment. The objectives of the project are: (1) To develop new UK based skills and knowledge in the design of smart non-woven textiles and know-how in the processing of shape change fibres; (2) To create smart non-woven textile demonstrators that provide proof of concept (PoC) of autonomous, hygroscopic adjustment of thermal and air flow resistance; (3) To develop a new service for SMEs, brands, garment and textile manufacturers that enables the design, creation and scale up of bespoke smart non-woven textiles specific to client needs; (4) To identify new market opportunities for smart non-woven in other textile sectors such as industrial and agricultural applications.

**Tincuta Heinzel
& Hillevi Munthe**
Loughborough University

Within the realm of electronic and smart textiles, there have been promising technological investigations that never quite managed to reach their potential (in fashion, smart interiors, wearable technologies, etc.). Despite these disappointments, industry, academia, artists and designers continue to explore the possibilities of electronic and smart textiles. Rather than presenting "the next big thing", the 'Attempts, Failures, Trials and Errors' project sought to show the various stages of projects' developments by exploring forgotten attempts and perspectives, less successful paths, and less mediatized wearable technologies and e-textiles projects. In this respect, the aim of the project was double: to reveal some of the unknown history of the emergent field of electronic textiles and wearable technologies and, secondly, to advance a critical perspective related to the current ever-present innovation discourse in an era defined by "fast prototyping", "publish or perish" and "start-up competitions". Following an open call, the project collected failed and rejected products, overstepped products and prototypes, non-working artworks, rejected scientific papers in the field of electronic textiles. The authors were asked not only to send a documentation of their un-successful or short-life projects, but also to offer a reflective note on their attempts and the afterlife of their projects. By doing so, the present project encouraged an ecological perspective which took into consideration the whole cycle of conception, consumption, ageing, and degradation of technology. The research approach reversed common R&D constructivist methods, by using deconstruction as a process of investigation. By questioning the ideas and the concepts of failure and success, the project puts an emphasis on art's capacity to be critical, while at the same time to poetically and self-ironically address contemporary challenges and concerns.

Attempts, Failures, Trials and Errors

Design Reductionism

**Shiro Inoue,
Neil Smith,
Nick Spencer,
Andy Tennant
& Paul A. Rodgers**

Northumbria University

This research explored the potential impact of the use of incomplete information generated from the act of image and form reduction, and how it affects an industrial designer's imagination. Human cognition has the ability to interpret or infer meaning when it is confronted with incomplete information and can use this as a means of ideas generation within the cognitive reasoning. The cognitive evidence suggests that human cognition per se is able to read rich knowledge in incomplete information during a process of reasoning. Meanwhile, in the design context, many studies have reported that incompleteness of information plays a significant role in the designer's imagination, particularly at the preliminary phase of the design process where ideas are conceptualised. Incomplete states of information, such as a lack of clarity, uncertainty or ambiguity, act as a driving force for the designer's idea development process. This research explored the intersection between the cognitive ability to find meanings in incomplete information and the designer's tendency of utilising uncertainty as a resource for imagination, aiming at developing a set of visualised tools that enhance the participants' creative reasoning. This research comprised a collection of studies observing how incomplete information dictates the design practitioners' reasoning, providing a series of tailored 2D and 3D "reductionist prompts". The results showed that reduced and incomplete information stimulated the design practitioners' diverse imagination, and the act of autonomous reduction encouraged them to interact, elicit insights and consider the subject from multiple perspectives.

Trading Design Education: The Perception of Power

Pushpi Bagchi
Edinburgh College of Art,
University of Edinburgh

This doctoral research project is rooted in the commodification of education and investigates the global trade of design higher education services, specifically, transnational education which is a system of education in which students live in a country different from the one where the awarding institution is based. For example, students living in Sri Lanka can study towards a degree from a university in England. The aim of this research project is to critically evaluate established systems for building transnational partnerships for British design education services and assess the power structures and knowledge flows of such cross-border academic systems. Initial research revealed a need for qualitative insights as the topic has predominantly been explored using quantitative methods and data. By using postcolonial discourse as a theoretical lens and ethnographic methods for data collection, the PhD researcher is studying the partnership between a university in the UK and a franchised private design institute in Sri Lanka.

Through field-work in Colombo, the researcher explored the complexity of facilitating a transnational academic collaboration by asking multiple stakeholders for their perspectives on the value of a British design education in a social, economic, and cultural context different from its own. The participatory mapping tool showcased visualises stakeholders' perception of power structures to influence institutional change. The researcher asked participants to order a list of stakeholders directly involved in the academic partnership and place those having more power to affect change towards the core and those having less influence towards the outer edges. The use of temporary tabs facilitated a spontaneous plotting process, allowing participants to change the order of groups based on their discussion. The maps revealed a clear difference in the perception of power on the ground compared to 'official' accounts of institutional hierarchies based on organisational charts.
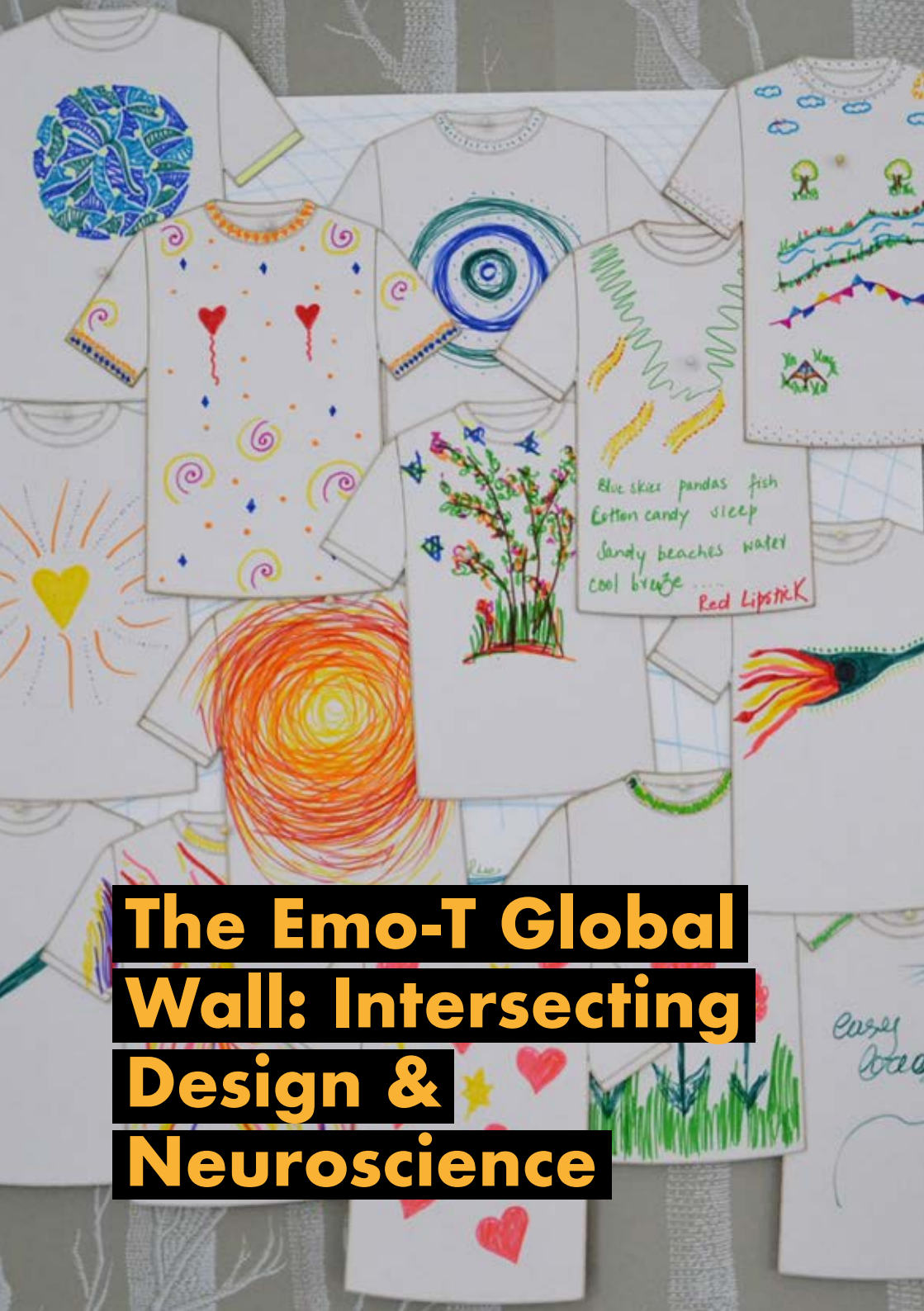
The Emo-T Global Wall: Intersecting Design & Neuroscience

**Ninela Ivanova
& Melanie Flory**

The Helen Hamlyn Centre
for Design, RCA

The Emo-T is a fun, learning and training design probe for emotional intelligence (EQ). The aim is to activate and engage creativity through positive-feeling emotions.

The study of EQ in psychology and neuroscience relates to the intelligent regulation of emotions. Research shows that people with a high EQ are self-confident, empathetic, open-minded, forgiving, learn from their mistakes and move on, adapt intelligently to change, have positive social relationships, and higher quality of life and life-satisfaction scores. Cultivating a high EQ takes practice. The Emo-T is an EQ cultivation probe.

For designers, creative exploration and personal expression of emotions is a route to developing greater empathy – an essential component of the designer mindset, research and practice to develop genuine people-centred solutions and experiences.

The Emo-T is effective in design and easy to apply. By just evoking positive feeling and emotions that one would like to explore and experience, participants design a T-shirt template which is a self-awareness practice in emotion processing. The 'humble' T-shirt is an accessible and powerful probe because it puts people in the mindset of consciously choosing to "wear emotions" that they prefer, and which are recognisable to others. With regular practice and exploration, an observable personal emotion-architecture develops.

This creative exercise takes 5-10 minutes from start to finish. The timeframe is important in ensuring emotion-memory retention and recall.

The research project team aims at co-creating a worldwide platform of engagement and development in EQ. They are looking for the right partners and sponsors to help them collate a million Emo-Ts to become the Emo-T Global Wall demonstrating the emotion-expression-design connection. The Emo-T has been well-received in the workplace and applied in leadership, branding, and sustainability workshops.

Challenging People's Perspectives of Ageing

Yoni Maartje Lefévre, Tara French & Gemma Teal
Glasgow School of Art

"Falling for old stereotypes, that would be my fear, I want to be different than all the other oldies, no offence" (Participant, age 14).

The rapidly ageing demographic in Western society influences people's own expectations of later life. People think it is very normal to be unhappy and depressed when you are old (RSPH, 2018:5). As part of Yoni Lefévre's Master of Research (MRes), this study sets out to reduce the stigma of ageing by challenging people's perceptions of elderly people through an intergenerational and participatory process using design methods.

The aim of this research is to gain a better understanding of people's experiences and perspectives on ageing. The objectives are to generate practical recommendations that can positively support the visual representation of older people in their community. Furthermore, the study identifies key insights about using engagement tools within a participatory process.

Semi-structured interviews were held with three older people (age 80+) and two adolescents (age 14) to understand their perceived image of a typical older person in relation to their lived experiences. Furthermore, two intergenerational workshops were organised with the same participants to collectively come up with new ideas to represent older people in everyday visual media.

This design research project offers insight into how society can radically change the way older people are represented in the media. Through qualitative analysis, the following recommendations can be considered when challenging current visual ageing stereotypes: (I) portray the diversity of the older age group, (II) rebrand ordinary ageing bodies through visual media and (III) provide balanced and playful conversations between generations. Finally, this research can inspire intergenerational engagements to stimulate positive perceptions towards ageing.
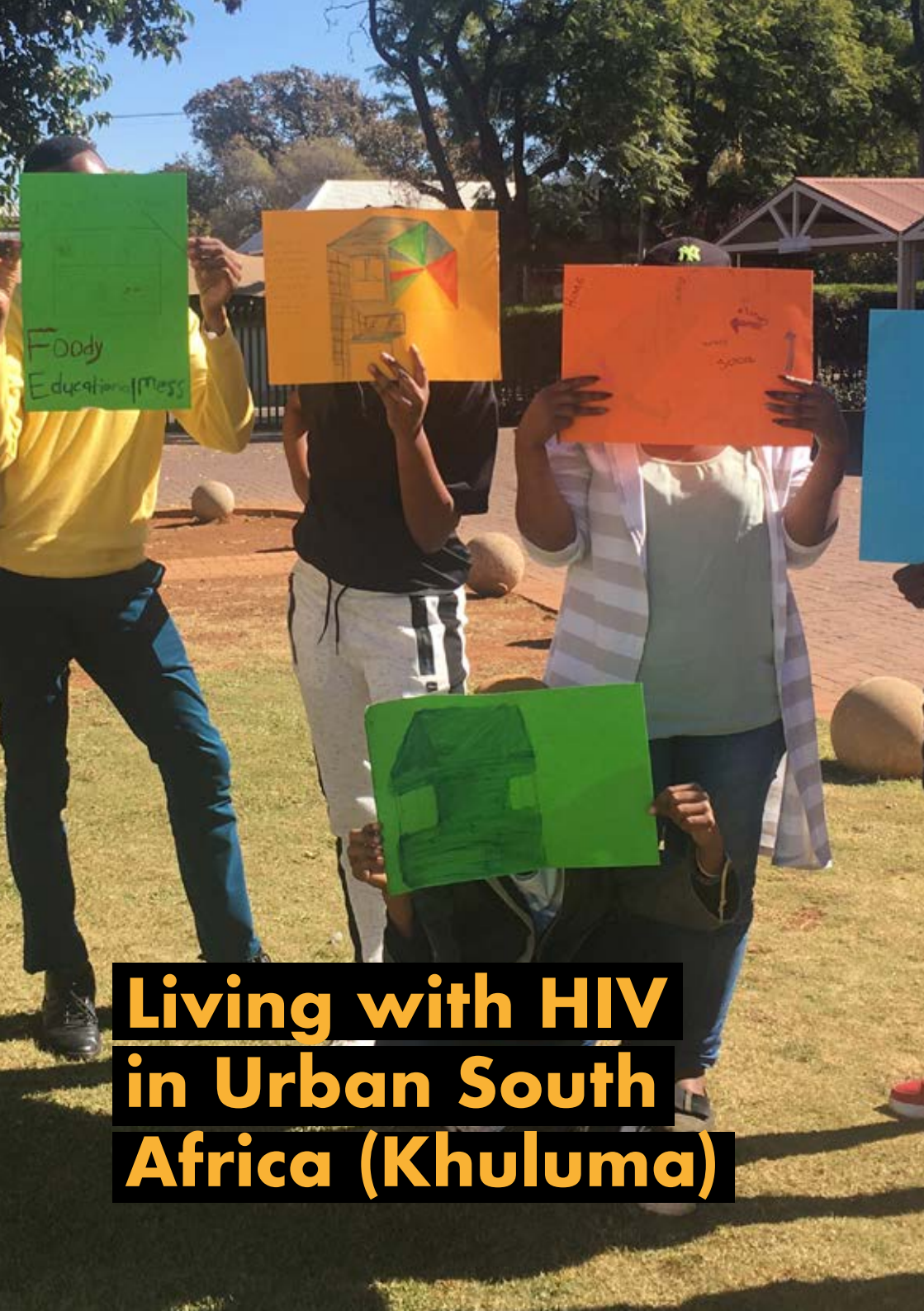
Living with HIV in Urban South Africa (Khuluma)

**Mikaela Patrick,
Malebo Ngobeni,
Tebogo Konkobe,
Ashleigh Beukes,
Nikita Simpson,
Geordan Shannon
& Anna Kydd**
STEMA, UCL Institute for
Global Health

This research project draws on the success of the Khuluma model, a digital psychosocial support intervention, a closed peer-to-peer messaging services for adolescents with HIV in Pretoria and Cape Town (South Africa). This research explored how digital spaces of care complement the physical spaces adolescents have to encounter to look after their health, thinking about the networks of care and support for complex health conditions such as HIV where mental health and issues of stigma are significant barriers to good care.

Understanding the complexities and specificities of the adolescent experience is central to this. The research team undertook 4 days of participatory workshops, with walking interviews through the hospital and community, visual diaries kept over the weeks preceding the workshop, creative exercises looking at representing home, participatory mapping and care journeys, and focus group discussions on what health and care mean.

These co-creation sessions form part of a mentorship process for the adolescent mentors and have led to producing a map of the adolescent system of care across the urban landscape and developing a taxonomy of 'spaces of care'. The research is an intervention in education and empowerment itself, a way for the adolescents to explore what care is beyond the biomedical view of treating illness.

The findings revealed how care was viewed as an exchange: that communication, respect and trust are key parts of caring. The research team found that the spaces most important for the adolescents health and wellbeing were: the home, where they felt safe and supported; places they could connect with others, such as the mall, or park where they can access wifi; places they could look after themselves, such as the school for learning or gym for fitness; and places where they could be creative, which varied between individuals.

Low Literacy in Rural Communities in China

Wenbo Ai
Royal College of Art

This research project was carried out at Hantun village in Henan Province, China in April 2018. It is led by a PhD student from the Royal College of Art, UK, guided by the Chinese National Health Centre and supported by the local health clinic.

It focuses on low literates' medical issues – the prescription and taking of medicines as prescribed – and aims at empowering such patients, giving them better control over their health. The researcher used ethnographic and participatory design methods to tackle these issues; a design workshop was held in a local shop that serves as a community centre.

The researcher prepared a supply of medicine packages and colourful media – memos, strings, tape, plastic stickers, pens – and asked the participants to use different materials and colours to represent times and dosages. They used these specific visual media to generate colours, dots and images, representing complex information and creating a unique visual language to use in their daily lives.

The workshop helped participants to design their own methods to understand medicinal information. This project contributed to shifting health promotion services from the hospital into the local community, considering the community structure and cultural issues of low literacy. It provided grassroots medical services to local people, especially the most vulnerable and the poorest, and enhanced their medicinal knowledge by means of community participation.

Designing Future Health and Social Care Services

Daniel Carey
Northumbria University

Health and social care services in the UK are no longer fit for purpose. Developed to meet the challenge of urgent, short-term problems with definitive causes and treatment pathways, they cannot cope with the complex, chronic challenges our society now faces.

How can we reimagine the relationships between statutory, voluntary, and charitable public services – giving them the tools to take advantage of their assets instead of being defined by their constraints?

This project presents an alternative model for these services. By unshackling community-based services from restrictive remits and irrelevant goals, we can rebuild these organisations as platforms to foster a deep understanding of the needs of their users, and to encourage peer-to-peer collaboration and fluid, informal enterprises as an alternative to existing hierarchical power structures.

This is an immensely ambitious undertaking that will struggle to displace deeply ingrained, systemic challenges – but if not now, when? Participation must not be limited to people who consider themselves 'designers'. We all have a responsibility to design these services to reflect our needs and the values of our communities as a whole.

The documents presented here are intended as the start of a discussion, not an endpoint.

AccessAutism

**Hannah Storey
& Tom Ormerod**

University of Portsmouth

Autism is a common condition with 700,000 people on the autism spectrum in the UK. Asperger's Syndrome is a higher functioning form of autism and the target audience for this project. People with autism struggle both socially and with sensory overloads, which can happen in lots of social situations, causing them pain and anxiety. Different senses can be overloaded at different times so the research team developed a solution that could help each sense either individually or together.

Together, Hannah Storey, a Graphic Design graduate and Tom Ormerod, a Master's Geology student with Asperger's Syndrome at the University of Portsmouth designed an app called AccessAutism. It is designed for autistic adults to help recentre themselves in the outside world following sensory overloads, using calming techniques. It is based on the idea of focusing senses on one stimulus to reduce overloads and grounding themselves in the moment, a technique that Tom uses.

Some features are grounding with options for physical and mental grounding, stimming games, breathing dots animation, diary, daily tasks and music. Users can create a personal account for calming background and grounding images to focus on as well as colour and type options to be saved. Haptic feedback has been incorporated into the app which the users can control as this would provide a tactile sense, helping focus on the phone or watch.

It is designed for Apple iPhones 6/7/8 and for an Apple Watch that links to the phone for notifications. The watch measures heart rate so that if this increases, it could mean the user was getting anxious or overloaded and needs to use the app to help recentre him/herself.

Human-centred Diabetes Digital Management

Mateus Machado
London College of
Communication, UAL

What if digital solutions for diabetes were conceived putting the patient at the centre, considering the human relationship with the condition before all the health data enabled by technology? The design research for this Major Project in Service Design (University of Arts London) explored how the combination of qualitative and quantitative data can change the value delivered by digital health.

This project uses a human-centred perspective to improve self-care of Diabetes type 1 patients. As many digital-enabled diabetes management tools have emerged in the last years, the research objectives were to uncover the reason behind the low adoption of these solutions (which are focused on numbers and targets) among patients and understand how digital technologies could better support diabetes management. The design research involved interviews with patients and diabetes experts, but also digital ethnography in online communities where people of all ages and lifestyles share their day-to-day of dealing with

their condition. Subsequently, the research involved design by doing, prototyping and testing solutions based on the first findings. The final prototype was a conversational experience, personified by a virtual assistant, which helped with self-care by raising questions around blood sugar level data collected by people with diabetes.

The research showed that by taking a more human perspective, digital management can be more relevant to patients making them more aware of the choices in their routines which are affecting their glucose levels, learning about themselves and their treatment.

The final output of the research was DEMA (Diabetes Exclusive Management Assistant), which is a digital service to raise and enhance the benefits of diabetes digital management by adding a QUALITATIVE layer to digital health solutions that are too focused on numbers and targets.

**Simon Andrews &
Joanna Grace**
Falmouth University

The BA(Hons) Sustainable Product Design students engage with human-centred design research methods to understand more clearly the needs of users for whom a product is being designed. The advantages of involving users from the beginning of the design process are well understood, leading to more informed design development and better designed products. The students worked with Joanna Grace, a Sensory Engagement and Inclusion Specialist and founder of The Sensory Projects. Her projects look to improve wellbeing for people who, due to profound disabilities or conditions such as dementia, experience the world in a primarily sensory way. Collectively, Joanna refers to the people she works on behalf of as 'Sensory Beings'. Through consultation and collaboration with children who are non-verbal and living with cognitive impairments, the students designed a range of engaging sensory educational products that facilitate independent interaction or a sensory conversation. The research seeks to expand the opportunities for co-design practice with audiences typically excluded from this process. More meaningful insights into the educational needs of these children are developed whilst also promoting playful interactions and joyful experiences. The students developed iterations of their design concepts, starting with basic resources that elicit sensory responses. The children gave them feedback at three stages of the project as the ideas developed. The students' observations included:

"His insight into how to use the resource was my inspiration for the product".

"She showed me it could be used in a different way to the one I had anticipated".

"He put it to his ear, which I hadn't thought of. I found that really interesting".

"He explained things in a completely different way and I learned a lot."

The project has recently won a National Creative Learning Award for Visual Arts & Design.

Sensory Products for Sensory Beings

Diversity Kit

Wenxiu Yang
London College of Communication, UAL

China is a multi-cultural society, with minority ethnic cultures making up a significant constituent of its population. However, under the influences of economic globalization and the rapid development of the Chinese economy, China's various social ideas are gradually converging, which means minority societies and cultures face possible decline. In fact, many are almost extinct. Another important reason why minority communities are gradually disappearing is the massive rural-urban migration, which is creating the phenomenon of "vacant villages." These rural minority areas are also prone to suffering the "Left-behind children" problem. Therefore, this project aims to address this issue by proposing a sustainable culture and economic development service model for a minority region, specifically targeted at "Dong" ethnic minority children The research project adopts service design methods and ethnic minority children of the Hengling village are its case study. The current proposal consists of three projects:

(1) Art Book, which will cover five different aspects including buildings, clothes, legends and musical instruments, and teach "Dong" children more about their traditional culture;
(2) Dress-up Doll, which will combine traditional and modern clothes to trigger children's interest in traditional clothes and also let them understand that "tradition" also changes with time and can still exist in modern daily life in a variety of forms;
(3) Postcard: Hengling village is a world cultural heritage protection site and the Chinese government is trying to develop the local tourism industry. Hence, if a postcard showing children's artwork is sold to tourists, it would further motivate stakeholders' implementation of the project.
The short-term goal is to solve the art education problem for the target group.The long-term goal is to realize sustainable culture diversity development of minority areas and solve social problems, including "left-behind children" by improving the culture identity and confidence of ethnic minority children.

Touchcraft

**Lucie Hernandez,
Edwin Love,
Chris Heinrich
& Alice Selwood**

Falmouth University

'Touchcraft' uses e-textile techniques to embed electronics and computational capability in soft, familiar surfaces. The research team designed and developed responsive objects and surfaces that have been embroidered and enhanced with electronics and sensor technology. They can be customised to produce sound, light or vibro-tactile effects that respond to touch.

The collection was designed to reflect the forms and geometries found in nature, particularly the interlocking structure of honeycomb and bubbles. To create dramatic volume and texture, the research team employed techniques such as tufting, felting, fringing, quilting, embellished with hand and digital embroidery, which adds structure to the textiles.

'Touchcraft' draws out haptic, tactile qualities in the textured, sensuous surfaces to invite playful touch exploration, gesture and movement. The experience of being in contact with the surface communicates familiarity and reassurance, contributing feelings of comfort that builds a connection.

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The Phenomenon of Glass Ships in Bottles in the UK

Ayako Tani
University of Sunderland

The manufacture of glass ships in bottles developed in the UK in the 1970s largely led by scientific glassblowers who turned their skills to giftware. The industry was particularly successful in Sunderland, where many individual makers were established after the closure of the local Pyrex factory. In the 1990s, mass-production was introduced, and although it was highly successful initially, it eventually led to a downturn in price and quality. The production of glass ships in bottles has disappeared from the UK after the final manufacturer outsourced work to China in 2005, and this important part of Sunderland's history and the associated glass skills have been almost forgotten.

This project investigates the glass ships in bottles business phenomenon, examining the social and economic environment of the period and identifying any parallels to current creative industries in the 21st Century. It also aims to preserve and disseminate the skills of scientific glassblowing, which is currently classed as an Endangered Craft by the Heritage Craft Association.

Researcher and glass practitioner Dr Ayako Tani has been developing an inter-disciplinary collaboration between the art, education and engineering industries. She has created several glass ships in bottles using reclaimed components from the closed Mayflower Glass Factory, which was the largest maker in the 1990s. These reassembled works suggest the possibility of reinventing glass ships in bottles as contemporary art and design objects made in collaboration with the community. Using skills acquired through her research, Tani has developed new artwork and giftware, including a collaborative project with Sunderland Maritime Heritage Trust. This commission demonstrates the continued viability of scientific glassblowing for art and attempts to promote these endangered craft skills. More collaborative projects are anticipated in the future through art and STEM workshops with younger members of the community.
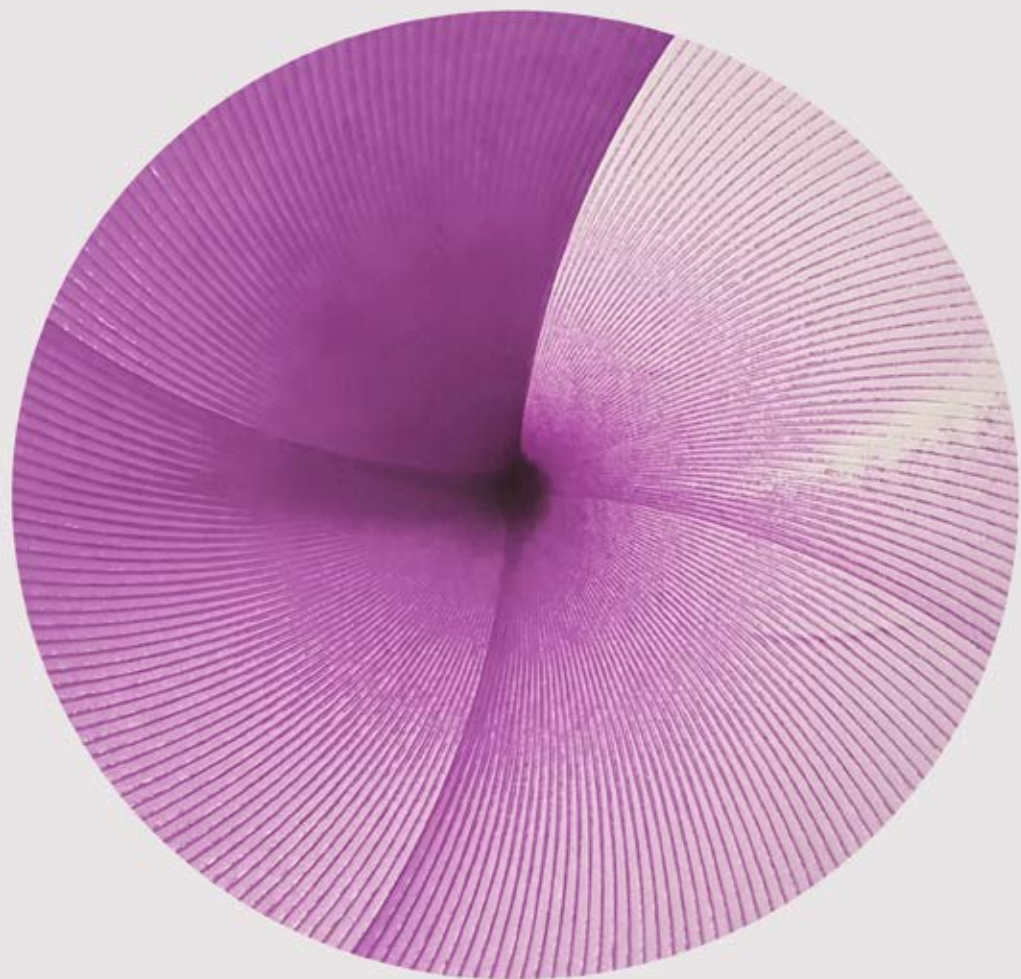
Abeer Basha Tirupattur

University of East London

Throughout history, artists and designers have pursued the search for the perfect shape and form through their works. The 'perfectness' was approached, examined, investigated and contemplated using various mediums, tools and techniques. Drawing inspiration from Munari's work on shapes, this project looks at Circle as an object of art, drawn using the robotic arm. This project 'The Perfect Circle' aims at exploring how robotic arm can be used to visually manifest different layers of meanings and concepts in a circle. Parallels can be drawn between the 'The prefect circle' and works of Kazimir Malevich and Mark Rothko. The different texture enabled by the marker pen in the robot's drawing generates a new dynamic and controlled approach towards exploring the circular geometric form. The drawing output echoes the artistic styles created in Malevich's work, a style which is explorative at its core representing pure geometric form and their relationships to each other and within the pictorial spaces in diverse ways.

Both the completed arcs produced by the new marker effect and the incomplete arcs by the used marker pen open up new trajectories for producing shapes. The colour gradation created through the series of arcs presents intersecting visual fields within the circle which simultaneously complete the whole form of the circle. In essence, the four sectors of the circle are represented as visual fields which play an important role in achieving the precise circle drawing.

While the project does not propagate robotics as a replacement for human skill and creativity, it rather supports a progressive view of robotics in the field of art and design. The focus here is on highlighting the rich potential of robotics through programming in creating new styles, techniques and approaches which had been remote so far for the human 'mind' and 'hand'.

The Perfect Circle

Crafting Narrative

**Eriko Takeno,
Yoko Arai &
Lutza Ireland**
Royal College of Art

This poetry-sculpture installation 'Crafting Narrative' invites the audience to experience the healing power of poetic thinking, by following the artist's own journey of poetic discovery and emotional recovery.

Eriko Takeno developed her workshop 'Sensory Multimodal Workshop; Space as Medium, Poetic Thinking as A tool', as a way to share with others her own introspective exploration of poetry as a therapy for anxiety. In the workshop, participants are invited to develop a mindful approach to their own perceptions of the physical environment and to communicate their experiences with the rest of the group. The workshop unfolds as a triple process of observation, visualization, and discussion. Working in collaboration with psychologists, Eriko has developed a method of somatic thinking through poetry, which activates a mutual connection between the internal and external spaces of one's own body. The workshop has been run in Japan and the UK for various groups of people, including clinical psychologists, school counsellors, and people with depression. The feedback from participants was analysed through a process of thematic-analysis to clarify a psychological function within the method. The somatic thinking of the workshop allows the practitioner to deconstruct traumatic narratives of anxiety and to shape them into new narratives.

This project has departed from an examination of the arts-centred education provided by Black Mountain College, an experimental school in North Carolina that provided a nexus for experimental artistic practice in the USA. Being inspired by the philosopher Federico Campagna (2018) who talks about vulnerability as an endless possibility for resolution, the researcher explores her own introspective experiences through her art practice in order to discover a way for how fundamentally an introspective experience can help others in their healing process. By translating the whole journey into an installation, the audience physically experiences the healing power of poetic thinking in a gallery space.

Can Design Help Mental Health Trusts Prevent Patient Suicide?

**Gyuchan Thomas Jun,
André Brito,
Aneurin Canham,
Cecilia Landa-Avila,
Satheesh Kumar
Gangadharan
& Fabida Noushad**

Loughborough University

Preventing suicide of mental health patients in the community is a major responsibility for mental health services. Detecting and responding to the suicide risks of patients is a wicked problem with incomplete, contradictory and changing requirements. Mental Health Trusts often fail to recognize this complexity and try to improve the situation by simply adopting more rigorous and frequent suicide risk assessments. The research team carried out holistic system-based design research and gained an in-depth understanding of how staff in the crisis and community mental health care teams actually detect and respond to suicide risk. The research team found that healthcare workers face inherent uncertainty and multiple dilemmas between clinical need, patient desire, legal obligations and resource constraints in detecting and responding to suicide risk. The research team translated these findings and inspiration from two true patient stories into a cinematic story-based film. A 26min film "Dilemmas in Suicide Prevention" was created to be used for the co-design of a large scale socio-technical system with multiple stakeholders. A 22min commentary film was subsequently created for producers and the director to share their behind-the-scenes thoughts and three key take-home messages from the film. The film was screened to around 50 delegates including commissioners, healthcare managers, practitioners, social care workers and police, and challenged the participants' simplistic views and provoked rich discussion on how they can better respond to this wicked problem. The film was also used as provocation for a multi-agency co-design workshop with 12 representatives from health care, social care and council. The workshop provided an opportunity to redesign suicide prevention policies, strategies and practices for enabling more positive risk taking and formal/informal peer support for effective and holistic suicide prevention.

Sensi

**Yiwen Zhu,
Yasmeen Bazian,
Yuxi Gao,
Rouyu Zhu
& Na Du**

London College of
Communication, UAL

'Sensi' is a project that explores the future of bio-molecular farming. It was developed by using speculative design as a tool to explore future scenarios and to test future concepts specifically in relation to biotechnology in the year 2039.

'Sensi' is a medical device in which a genetically modified plant could grow, produce medicine and interact with patients. It provides essential medicine for people with chronic illnesses. It is affordable and thoughtfully designed to help patients overcome the stigma of carrying their medical equipment around.

Patient and plant develop a connection whereby they both care for each other. 'Sensi' provides medicine and serves as companion for patients with chronic diseases who often feel lonely and isolated.

Patients, in turn, care for 'Sensi' by ensuring it has the essential elements to thrive: sunlight, water, food and, above all, love.

The more care and love the patient provides to 'Sensi' the better-quality medicine 'Sensi' will produce.

The aim of the project is to:
1) engage the wider public in conversations around the introduction of Plant Molecular Farming; 2) explore possible, preferable and desirable futures of biotechnology for medicine; 3) explore the connection between humans and genetically-modified plants.

Future Made By Me

Ziwei Wang
Glasgow School of Art

'Future Made By Me' youth career guidance interventions/workshop/workbook is inspired by LifeDesign, first invented by Savickas, is a non-traditional way of doing youth career guidance where it sees career as part of life rather than a separate topic, it helps young people find a career path where there are meaning and happiness both in and outside work life, and the path is personalised. The guidance aims to give young people a clear mind, a dream and a plan. To be specific, it aims at helping emerging adults learn, know and use their current status, stage of life and available resources; develop a future-oriented thinking, be clear of a desirable future; and develop a plan for reaching their aspirations, be confident with it and make actions accordingly on their most important task at present right away.

Delivered as face-to-face guidance sessions on a one-on-one base or as a group workshop and appreciating young people as the experts of their life, these sessions are run like storytelling with friends but topics are carefully designed so there is the most to take away. The 'Future Made By Me' service design product is the outcome of a qualitative research that applies design thinking in the methodology, and a bottom-up design with young people's involvement from when the researcher started to identify the research problems. The researcher is also a practitioner (Youth Worker) who actively works with young people directly, which brings an action research nature into the study and also ensures reliable first-hand data for evaluation.

Empowering Youth Through Entrepreneurial Skills
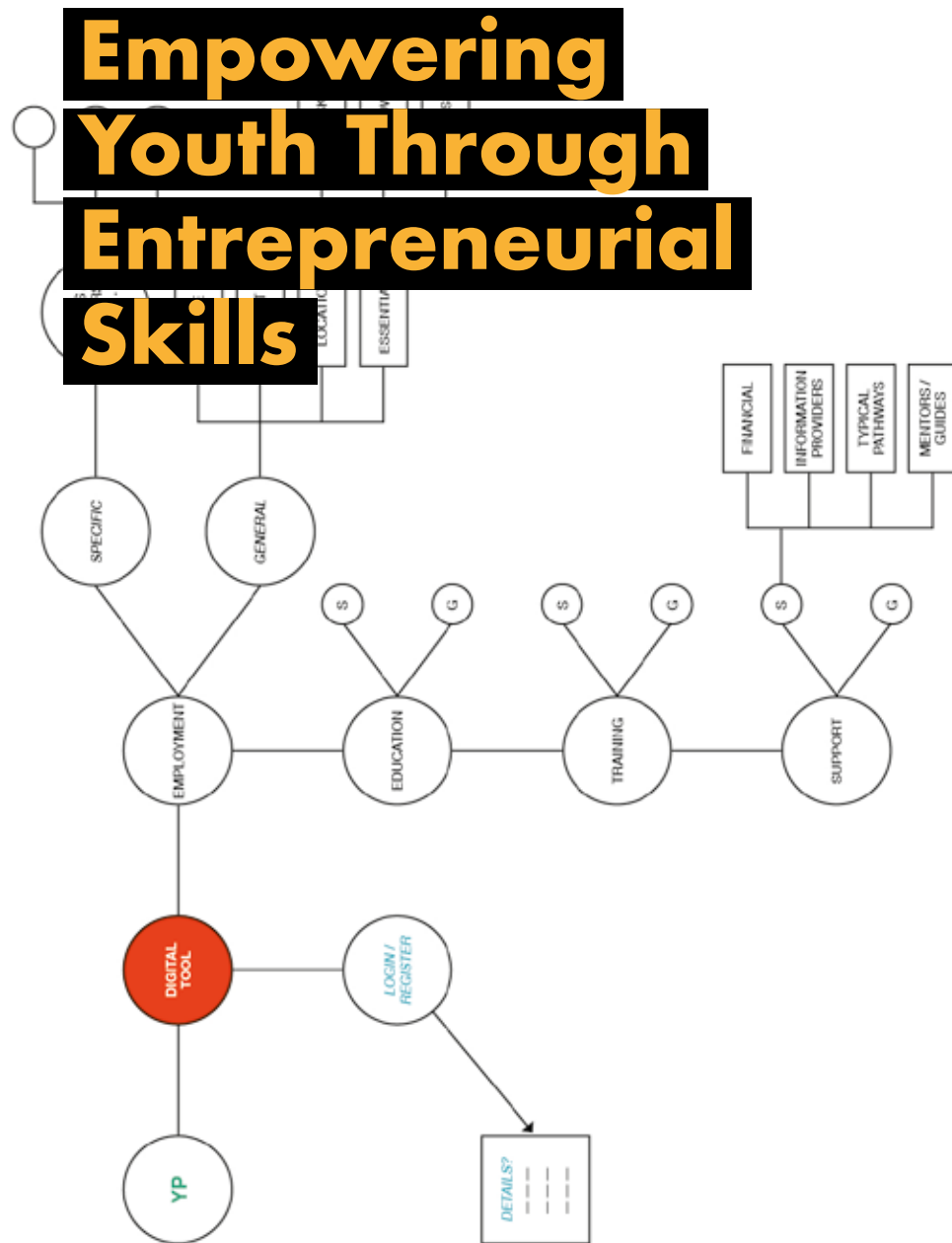
Anastasios Maragiannis, Stephen Kennedy, Catherine Maffioletti, Kam Rehal

University of Greenwich

In North West Europe, 14% of young people aged 15-34 are Not in Employment, Education or Training (NEETs). Since NEETs are rather unresponsive to traditional top-down approaches and have limited opportunities to engage with existing support and referral schemes, they risk long-term labour market exclusion. This project proposes to close this gap experienced by NEETS and increase access to employment, education, and training opportunities through the development of a digital tool that fosters entrepreneurial thinking and activity. While entrepreneurial education has become an EU priority to tackle labour market exclusion, a consistent approach to engaging NEETs is missing. To make a real difference, a transfer of knowledge across regions in Europe is needed to generate an innovative, inclusive, transnational model. This model can provide NEETs with the necessary essential support (in North West Europe) while responding to the specificities of local/regional contexts and NEETs' individual needs and goals. The co-designed EYES approach combines entrepreneurial education with personalised coaching supported by a digital platform to help NEETs access local services, resources and regular support schemes, to encourage the development of an entrepreneurial mindset. Following evaluation of coaching approaches across regions in North West Europe, the Digital Tool champions best practices in coaching – enhancing capacity for outreach and cross-connecting services, methods and resources. The EYES Approach package includes digital tools and coaching materials; four bilingual training sites that will prepare 25 coaches to run the pilots in the Ruhr area, Greater London, Flemish triangle, European Metropolis of Lille, and Tilburg. All regions supported by a common helpdesk. Part of this research team's work package within this EU funded (alongside other funders) project is to lead a team to develop a co-design methodology. A series of interdisciplinary and multicultural co-design workshops will result in the development of a responsive, socially inclusive digital tool.

Gamified Workshops for Early Stage Technology Start-ups

Poorume Yoo
London College of
Communication, UAL

392,000 technology start-ups have been registered in the last five years in the UK. However, over 90% of them will fail due to the face that early stage start-ups miss the user-centred mindset in their business development process.

The start-up journey is tough because not many of them can have an opportunity to get professional mentoring from support organisations. This is because the start-up ecosystem has been focusing on finding the start-ups who can quickly become successful. The main challenges for start-ups and support organisations lie in not giving time to empathise with the end-users and jumping to build products or services.

This research project aimed to grow a user-centred mindset for early stage technology start-ups and support organisations to discover a more design-driven idea development process, which can contribute to bring innovation into our future life.

The key areas of research were the UK technology start-up ecosystem, start-up mentoring programmes, a collaborative organisational culture in a rapid technology development environment.

This research questioned what the key activities are to engage start-ups in learning about user-centred mindset during their business uncertainty.

Also, finding an opportunity for effective coaching service for support organisations to engage their start-up partners' sustainably. In this research, the design researcher partnered with Digital Catapult to explore new opportunities for supporting technology start-ups and to find effective management for their business.

Multiple methods have been adopted in order to design the actionable solution. Fundamentally, user-centred design led the research direction, lean start-up and agile methods were followed to reduce the risk of misleading the project and manage the constraints.

The research outcome 'Reflecto. co' gamified workshop and toolkit, was tested by end users and research partners. The outcome has been used by start-ups and stakeholders within the start-up ecosystem, which proves that the design creates positive impacts on users and businesses.

Conclusions

Design solves problems. From the molecular to the multinational, design is inherent to human activity and creativity, but design at its best is a self-effacing discipline. Its simple, efficient and useful results, the products and services which we use throughout our daily lives, show nothing of their iterative, painstaking evolution and development. This is seen nowhere more clearly than at the London Design Fair, which showcases the most beautifully simple products and services available today.

But design is also disruptive. It does not simply build on what has gone before: it overhauls, starts again, rethinks and remoulds. It returns to first principles to avoid the assumptions, both good and bad, of earlier iterations, and in doing so finds answers to questions it has perhaps not even been asked.

This is why design research is so important, and why it is such a force for change. From reinventing primary school furniture to addressing the grand challenges of the Industrial Strategy, design research is disrupting traditional modes of enquiry and is instead looking for next-generation solutions to a future

of the fourth industrial revolution, environmental instability and data-driven politics. If we are to meet these challenges, whether they be political, economic, social, technological or environmental, it is vital that we maintain the health of design, and of design research within the academy which is the lifeblood of the profession. For this reason, the Arts and Humanities Research Council is once again proud to support its Design Leadership Fellow, Professor Paul Rodgers, and the Design Research for Change exhibition at the London Design Fair.

Professor Edward Harcourt
Director of Research, Strategy and Innovation
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Project Partners

2580 Association (Romania)

Bauhaus University (Germany)

Beam (The Netherlands)

Berlin University of the Arts (Germany)

Civic Action and Consumer Action Group (India)

Deco Publique (UK)

Digital Catapult (UK)

DZNR Design Studio (Romania)

Eight Associates (UK)

Federal University of Minas Gerais (Brazil)

Global Health Disrupted (UK)

GoFit4Fun CIC (UK)

Harvard University (USA)

Imperial College London (UK)

Indian Institute of Technology Bombay (India)

"Ion Mincu" Architecture and Urbanism University (Romania)

Kibla Multimedia Center Maribor (Slovenia)

KraalD (UK)

KTH Royal Institute of Technology (Sweden)

Leicestershire Partnership NHS Trust (UK)

London School of Economics (UK)

MAMA (Maternal Aid for Mothers in Africa) (Kenya)

MindRheo (UK)

MMT Textiles Ltd (UK)

Montreal Arts Interculturels (Canada)

Non-woven Innovation and Research Institute NIRI (UK)

Piksel Festival (Norway)

Queen Mary University of London (UK)

Salonul de Proiecte (Romania)

School of Design, Hunan University (China)

Scottish Graduate School for Arts & Humanities (SGSAH) (UK)

STEMA Health System Innovation (UK)

Swinburne University of Technology (Australia)

The Eastman Dental Institute, UCL (UK)

The SHM Foundation (UK)

UK Games Fund (UK)

University of Amsterdam (The Netherlands)

University of Applied Arts Vienna (Austria)

University of Chichester (UK)

University of Creative Arts (UK)

University of Oradea (Romania)

University of Washington (USA)

Victoria and Albert Museum (V&A) (UK)

Virginia Commonwealth University (USA)

War Child Holland (The Netherlands)

Willem de Kooning Academy for Art and Design (The Netherlands)

ZEST Collective (Romania)

Project Websites

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Professor Paul A. Rodgers
AHRC Design Leadership Fellow
Imagination, Lancaster University

Typeface: Futura. Printed in an edition of 1000.

Design Research for Change 2019 is a showcase of over 60 design-led projects that traverse disciplinary, methodological, geographical, and conceptual boundaries. The projects illustrate wide-ranging social, cultural, and economic impact and highlight the significant roles that UK-based Design researchers play in some of the most complex and challenging issues we face both in the UK and globally and the positive outcomes that are being designed and developed. The projects highlighted here tackle a range of significant and complex challenges such as developing design tools and processes that will support people living with dementia to live high quality lives, designing systems that ensure children's educational rights are met, and designing methods for producing more sustainable food practices. All of these research projects highlight the amazing design research talent we have in the UK. Moreover, the design research showcased here illustrates the innovative and creative ways of working that will ensure our designed futures are in safe hands.