

# Northumbria Research Link

Citation: Wallace, Jayne, Marshall, Justin and Rogers, Jon (2015) Crafting the Digital. In: Crafting our Digital Futures. Victoria and Albert Museum, London, UK, pp. 108-112. ISBN 9780957686847

Published by: Victoria and Albert Museum

URL:

This version was downloaded from Northumbria Research Link:  
<http://nrl.northumbria.ac.uk/29606/>

Northumbria University has developed Northumbria Research Link (NRL) to enable users to access the University's research output. Copyright © and moral rights for items on NRL are retained by the individual author(s) and/or other copyright owners. Single copies of full items can be reproduced, displayed or performed, and given to third parties in any format or medium for personal research or study, educational, or not-for-profit purposes without prior permission or charge, provided the authors, title and full bibliographic details are given, as well as a hyperlink and/or URL to the original metadata page. The content must not be changed in any way. Full items must not be sold commercially in any format or medium without formal permission of the copyright holder. The full policy is available online: <http://nrl.northumbria.ac.uk/policies.html>

This document may differ from the final, published version of the research and has been made available online in accordance with publisher policies. To read and/or cite from the published version of the research, please visit the publisher's website (a subscription may be required.)

[www.northumbria.ac.uk/nrl](http://www.northumbria.ac.uk/nrl)



**CRAFTING  
OUR  
DIGITAL**

As part of

**V&A Digital Design Weekend 2015**

**FUTURES**

# Crafting Our Digital Futures

As part of V&A Digital Design Weekend 2015

First published in the United Kingdom in 2015.  
Published by Uniform Communications Ltd.  
© Uniform Communications Ltd, 2015.

All Rights Reserved. No part of this publication may be reproduced or transmitted in any form or by any means; electric or mechanical, including photocopy, recording, or any other information storage and retrieval system without prior permission in writing from the publisher.

ISBN : 978-0-9576868-4-7  
Printed in Great Britain.

**Edited by**  
Irini Papadimitriou, Andrew Prescott and Jon Rogers

**Design by**  
uniform.net

# It all started in Mexico and Dundee!

I'm writing this sitting at my temporary working space at the Wits Art Museum in Braamfontein, one of Johannesburg's most energetic, vibrant, and also fast changing districts. This is where for the next few weeks, working with a group of artists, designers and people from the surrounding area, we will be exploring cultural technologies and futurist visions of the city, through a series of public activities and creative collaborative events.

Usually when we speak about or imagine the future and the changing face of our environment, we are presented with a vision that is not human, an image that lacks personal stories. Such visions present us with technological wonders – such as drones, bitcoins, apps, 3D printing and VR headsets – which all-too-often take precedence over the people who will live with these advancements. Here in Johannesburg, I am part of an exciting project that is part of Fak'ugesi the African Digital Innovation Festival. This work aims to put people first: to hear their voices, harness their creativity and find their stories of what they would do with emerging and everyday technologies.

Sitting here in South Africa, wondering what might unfold over the coming days of making, takes me back to the start of the journey of the publication for this year's V&A Digital Design Weekend. Crafting our Digital Futures is a collection of projects, collaborations, ideas and exchanges that explore how people can shape the future of the digital world they want. The works draw from communities and cities, from civic awareness, engagement and making, and innovation. What ties all of this together is my belief that innovation happens in unexpected places, and very often emerges from grassroots activities. It is unashamedly driven by valuing the bringing together of people, many of whom will not know each other, and creating a space during the Digital Design Weekend for them to share ideas and skills, to make things collaboratively, and fundamentally to take action and craft their environment to bring about the digital future that they want.

## **And it all started in Mexico City and Dundee!**

Earlier this year, I had the great opportunity to join a team of brilliant people from across the UK and Mexico City. With the support of the British Council, we started a very exciting journey connecting people across the Atlantic in a series of cultural exchanges, the Digital Futures UKMX, part of our monthly Digital Futures meetup that is an open platform for displaying and discussing work. Digital Futures UKMX took place as part of the Dual Year of UK and Mexico 2015; a year-long celebration of cultural, educational and business exchange between the two nations.

The event brought together communities in Mexico City and Dundee to explore, develop and co-design open collaborative tools and projects addressing issues such as the environment, climate, open data, waste, sustainability and more. Participants on both sides of the Atlantic joined with incredible enthusiasm to explore their cities in new ways and show how working collaboratively can influence, improve or change the civic design of our communities, cities, public space, the web and more.

During a long weekend of joined events and conversations, we explored the different layers of these two cities, encompassing visible and invisible networks, markets, local crafts, artisans and foods. We exchanged photos, sounds, videos, and even recipes, from the two cities! By starting a cultural exchange based on our very human lives, we may not have always followed the routes that a new tourist to Mexico or Dundee might take, but sought to explore the city through each other's eyes.

I am sure that Mexico and Dundee are not two cities that would be people's natural first choice for a twinning exercise of this kind. However, when framed as an exploration of innovation coming from unexpected places, then inviting people from a huge city like Mexico City, with a population of 22 million, and Dundee, which has less than 150,000, starts to make more sense. To bring people together from these two very different cities was a great chance for thinking about common links and the challenges we face in both a megacity and a small one. What's interesting is that since we've been exploring design across these two cities, we're uncovering more and more unexpected connections; connections which are helping to form a deeper cultural exchange. Andrew Prescott, the AHRC Leadership Fellow for Digital Transformations, did a bit of digging around in the archives of Dundee and discovered some rather exciting connections between these two cities. I'll not spoil what he found: you'll have to do some digging of your own into this very publication to find out for yourself.

Coming back to the Digital Design Weekend, our biggest event of the year, is a great opportunity – and with no little thanks to the valuable support and contribution from the Arts and Humanities Research Council Digital Transformations Theme – to bring into the conversation not only the partners and work created during the Mexico City and Dundee exchange, but also many other brilliant projects, designers, artists, makers and collectives that explore and enable civic engagement. Helping to bring out people's inventive, engineering and making skills and present us with powerful ways of solving contemporary problems. The things that you're now going to read about are far from the maddeningly mass-produced and the uniform, a route down which some might fear digital design might be heading. It rather presents a collection of highly crafted, bespoke and personalised responses to a multitude of alternative futures. A series of futures that we can see are crafted for people. Thank you for taking time to explore with us the start of our journey.



*View from the top of Laboratorio Para Ciudad during UKMX*



## Civic Engagement And Collaboration

### How can we work collaboratively to influence and change the civic design of our communities, cities and public space?

This was the question posed to citizens in Mexico City and Dundee. Digital Futures UKMX, an initiative proposed by the V&A Digital Programmes and the British Council, invited artists, designers, technologists, engineers and makers on both sides of the Atlantic to work together, share ideas and design open, globally relevant tools for the future. Today, around 54% of the world's population live in cities and this figure is expected to grow by an estimated 1.84% for the next five years.<sup>1</sup> Now more than ever, it is crucial that members of the world's cities have the capacity to evaluate their environment and the resources and support to develop meaningful solutions that can be shared across the world.

#### The Creative Economy team

The role of the Creative Economy team at the British Council is to connect people to answer the bigger questions that will affect the cultural sector and creative industries. The department supports a network of pioneers and innovators from a variety of backgrounds such as artists, academics and industry leaders to explore the meeting points between culture, technology and business. We support a global network of co-working, hub spaces and an ongoing programme of hacks and labs bringing businesses, creative technologists, designers and developers together to create solutions to social issues.

#### Designing solutions through prototyping labs and hacks

"In the cultural sector, hacks, hackdays and hackathons are events that seek to develop new relationships and collaborations, whilst creating solutions and unravelling challenges."<sup>2</sup> They provide a safe testing ground to try out radically new ideas; participants can grow a prototype from an idea into physical or digital form, learn from their mistakes and are able to meet others in a supportive and discursive community. It is these low-risk environments that give creative technologists the space both mentally and physically to create solutions to real problems and questions.

Digital Futures UKMX was a series of labs that invited participants to prototype solutions to issues such as the environment, climate change, e-waste and sustainability. The key aim of this project was to connect the digital and creative communities from environments half way around the world to devise solutions relevant in both places. Expanding the dialogue in this way meant that we could learn from each other, while proposing globally relevant products and prototypes.

### Mexico City and Dundee; linked

We are connected via an expansive digital network, allowing us the opportunity to exchange content and ideas which form the crucial basis for innovation. Labs in both countries were connected at points via web link ups, meaning citizens could share ideas and information as they were happening; keeping the immediacy and vibrancy that allows ideas to develop organically, sometimes lost when working remotely.

Between the 19th and 21st June 2015 participants in both countries gathered information from their cities, this preceded an intense 48 hour prototyping marathon and culminated in 15 products and prototypes currently being developed at time of print. In Mexico City over 50 people met at Laboratorio para la Ciudad (the Laboratory for the City), to go on a walking tour of the city. Led by Creative Dundee, the same happened in Scotland. Both tours offered a unique view of the city, allowing participants to draw on the fabric of both locations.

Around 200 people signed up for the 48 hour prototyping marathon at Centro de Cultura Digital, citizens from a diverse range of disciplines came together to start designing sharing tools to be used between the two countries. The appetite for events such as this was clear on both side of the Atlantic; 12 working prototypes were presented at Centro de Cultura Digital and six in Dundee.

### What can these two cities learn from one another?

Mexico City is home to around 22 million people, it is the largest Spanish-speaking city in the world; Dundee by contrast is home to around 150,000.<sup>3</sup> Why then have these two environments apparently so different been linked? What can such a big city learn from a small one? While each place faces challenges specific to its size, expansion and geographic location, there were striking similarities identified making them ideal partners to inspire and learn from one another.

Dundee was recently named as City of Design by UNESCO 'recognised...for its diverse contributions to fields including medical research, comics and video games'<sup>4</sup>, it is the first city in the United Kingdom to receive this accolade. Dundee has an engaged and established community of creative people and collectives. It is famous for its contribution to the arts, technology and medicine among other fields. It has two Universities with world-leading roles in the video games industry among many others and the V&A will open there in 2017; it is a centre for innovation and design and this his wealth of talent and expertise made Dundee an ideal UK hub to twin with the culturally rich and diverse setting of Mexico City.

### Working together for a collective, digital future

It was clear from the prototypes produced and conversations taking place that the relative size difference between Mexico City and Dundee was not a hindrance. Participants were keen to connect with each other to exchange aspects from both countries and remix elements of British and Mexican culture. Connected digitally over the web the groups were able to interact with each other live, harnessing their enthusiasm and energy to form a bridge across the Atlantic. Participants produced solutions to navigate our experience of the built environment, both physically and mentally, in a playful, engaging and considered way.

At its core, Digital Futures UKMX is about connecting people. It is an illustration that for inspiration and innovation we mustn't forget or overlook the creative value of the individual within the testing ground of the lab. It is clear that with the right environment, networks and enthusiasm, the innovative potential from collaboration can be achieved in the long term. Civically minded citizens need the space to test concepts, speak about their work critically and crucially, be able to make mistakes when designing solutions for the future. These pioneers, able to turn an idea into a physical or digital product or object, form a vital role within the Creative Economy globally. Digital Futures UKMX is part of the UKMX 2015 season of culture celebrating the cultures of the UK and Mexico; British Council is proud to have supported this project as both an important learning tool between the two countries and a means to drive forward urban innovation from the civically minded.

<sup>1</sup> [http://www.who.int/gho/urban\\_health/situation\\_trends/urban\\_population\\_growth\\_text/en/](http://www.who.int/gho/urban_health/situation_trends/urban_population_growth_text/en/)

<sup>2</sup> <http://futureeverything.org/wp-content/uploads/2014/10/BC-New-Playgrounds.pdf>

<sup>3</sup> <http://www.dundee.gov.uk/sites/default/files/publications/Dundee%20Economic%20Profile%20March%202014.pdf>

<sup>4</sup> <http://www.dundee.gov.uk/unesco>



## Coding Mexico

Mexico is a country pursuing questions. In the global code that integrates a long series of variables that act both as ladders and fences of a never ending puzzle, the pieces we have are quite exposed. With a growing population that made possible our inclusion in the MINT group – economist Jim O'Neill's ultimate attempt to encapsulate and understand the impact of markets like Nigeria, Indonesia, ourselves and Turkey – Mexico also faces disturbing levels of inequality in the distribution of wealth. The 14th largest economy in the world – according to Forbes<sup>1</sup> – and homeland of the omnipresent Carlos Slim still has 45 million people living in poverty, according to a recent study by Gerardo Esquivel published by Oxfam.<sup>2</sup>

Violence is also a major issue. Ayotzinapa, Tlatlaya, Apatzingán and Ostula can explain quite sufficiently what's going on in the country. In addition, the alarming number of journalists being killed and the rate of feminicides have played a part in the Mexican political crisis of the last three years. Crisis that involves not only the government but also the military and of course, the narco effect. Crisis that on the other hand, is unable to change key elements that may lead us to a better future. Because being an affected and injured nation does not mean that creativity and collaboration are over. This multi-coloured algorithm called Mexico is more a promise than a sentence. History has shown us that when struggles involve and include uncommon and dynamic players and inserts them into creativity paths, things can improve in a positive way. Name it Cape Town, name it Turin. Name it Dundee.

We are entering an era where workforce will act as a factor that determines growth and also the new concepts that surround it. Those that will be able to join the conversation – and make it more inclusive – of who we are, what is culture, how we create and consume benefit, how we relate ourselves to our environment, how we produce and of course, how we deal with what's left, are those embracing new ways to talk, whether it is through a video game that evidences and proposes answers to any given conflict or programming a radar, a 3D printer or prototyping what could become the next digital fascination on the horizon. There's no limit and no format. In the most dynamic era in terms of knowledge – sharing the goal is to play together: no matter if it's done from a laptop at a teenager's home or through a happily frantic marathon that joins the talents of two countries in one big auditorium in Mexico City. It's all about the creative assets and the will to make of this present code, a prime venture able to change the perspective and the effects of what we consider design. We are designing Mexico and it's open-source. Feel very welcome.

<sup>1</sup> <http://tinyurl.com/pk2gq52>

<sup>2</sup> *Desigualdad Extrema en México: Concentración del Poder Económico y Político* <http://tinyurl.com/nq7jrc>





## Writing And Designing

### The Future

#### The Beginning

Sunday, June 21. 4:34 am I wake up, mildly disoriented. I've been sleeping on a row of padded bins; my pillow is the briefcase I keep my computer in. My back hurts. I sit upright. The scene around me is similar: bodies defeated by fatigue. People sleeping on the floor, in chairs, wherever they can. Only one is seated in front of his laptop, focused, unblinking, while the others rest to re-energize.

I approach the survivor. He's programming a video game. He tells me that the techies on his team had stumbled into an insurmountable bug and given up. But not him. He's still at it. That's how you experience Digital Futures: sleepless, against the clock. At seven in the morning - when the others start to wake and return to their workstations - he succumbs to exhaustion. At least he's got the game far enough along for his companions to resume it and finish the prototype on time.

I've been in the Centro de Cultura Digital (Digital Culture Centre) since Saturday, although the marathon session started on Friday night. When I arrive, the work teams are already organized and the ideas are flowing. A few people at one table are outlining some glasses that will produce lucid dreams; at another, they're designing a video game with a gender perspective. Nearby, others are thinking up a proximity alarm that would prevent people from injuring themselves on the subway; in the back, they're concocting an application for personalized trips around Mexico City.

Digital Futures is a unique hackathon that brings together three creative communities: video game creators, makers, and dataists. Although the gamers are the majority, there are also designers, illustrators, and musicians. This is an opportunity to play with hardware, to invent things. Someone requests an Arduino board; another prints a piece in 3D. It's a hackathon of ideas transformed into objects and of objects transformed into intentions, into proposals. Into futures.

#### The Projects

On Sunday, at 5pm, the participants are called to the stage. There's no time left to add functions or polish details. The presentations are about to begin, and they'll have to represent themselves with what they've achieved so far. Each team has a few minutes to introduce its idea and show its prototype. Amid nerves and laughter, they make their way down the plank before leaping into the void.

A dozen projects remain at the end of the work sessions. Of those, some were developed only up to a certain stage, and others are still limited to the conceptual phase, with a prototype that depends on the audience's imagination. For example, one enthusiastic young man presented Light Shot, the model for a bullet train to travel around the capital – futuristic and fantastic, but impossible to apply. Another similar case is that of an augmented reality project dedicated to promoting the conservation of pre-Hispanic cultures. Good ideas, certainly, but mired in one of hackathons' endemic ills: proposing far-fetched concepts without heeding what's viable. Without at least a basic prototype, only illusions prevail.

Other teams decide to focus on what they know how to do. For example, a group of video game developers presents Super Dog Squad International, a collaborative video game centered on some dogs that have to combat an invasion of meat cuts. I remember passing by their worktable the day before and wondering what the purpose of the project could be. "There isn't one," they responded lightly. "It's meant to be fun; it doesn't have a social objective. It's totally playful." Not having a declaration of principles is also a declaration of principles.

Another video game presented is Proyecto Recicla (Project Recycle), which seeks to promote a culture of recycling among children. The dynamic is simple but addictive: to separate the trash (paper, plastic, or organic waste) into the appropriate container and thus keep the Trash Monster from winning. The straightforward design is ideal for a mobile game. A seed for a social project that could grow if it ultimately takes itself more seriously.

Don't Touch Me emerges in this vein. The under-slept guy comes onstage – the one who spent all night in the trenches. I'm pleased to see that he's advanced his mission. A video game (yet another one!) appears on the screen with a very simple narrative: the main character moves through a passageway in which he has to avoid obstacles and recover items. The subject is the fight against bullying in school: the obstacles he has to overcome are bullies, and at the same time he has to rescue victims of their abuse.

I was able to sit and chat with them in the project's early phase. Curiously, the idea to focus on bullying doesn't have a personal backstory, despite the fact that it's a common problem in Mexican classrooms; rather, it was an idea that occurred to one of the members. In addition, the team developed a specific musical score for the game, lending it yet another layer of experience. At one point in the development process, they showed me the previous version of another game, one focused on the prevention of drinking and driving. Seeing the results left me thinking about what they could have achieved if their programmers hadn't thrown in the towel, because they have potential and dedication in no short supply.

## High Potential

"This is a MaKey MaKey," Juan Antonio, a curly-haired eighteen-year-old, explains to me. He hands me a small metal plate. Created by Jay Silver and Eric Rosenbaum, MIT grad students, MaKey MaKey is a device that uses a circuit board, a USB cable, and various cables with alligator clips to connect objects to a computer and perform basic tasks – clicking, pressing the space bar, etc. Its mechanism is a very simple one: the plate connects to the computer via the USB cable; the plate is then connected to an object capable of transmitting a minor electrical current (from a piece of paper to something less conventional, like a piece of fruit) through the cable with the alligator clip. The result is that, when you touch the object in the circuit, a determined action takes place.

Juan Antonio's team (composed of two other pre-college students) seeks to make a proximity-detection alarm for the Mexico City subway. The idea is that a warning alert goes off if a person is at an unsafe distance on the platform before the train arrives. To achieve their objective, the group uses an Arduino board, the MaKey MaKey plate, an ultrasound sensor, and an aluminium foil strip.

Rompiendo líneas (Breaking Lines) is both a creative and a low-cost solution. The aluminium foil strip is located on the dividing line between the platform and the subway tracks. When a person makes contact with it, the alert goes off. But how to keep the alarm from sounding when people get on the train? The answer lies in the ultrasound sensor: it detects the subway's distance, sending the information to the Arduino board. When the vehicle enters a determined range – for example, when it's pulling into the station – the system is deactivated, allowing users to board without triggering the alarm.

When the team presents the prototype, they perform a small test at a thirty centimetre distance. It works perfectly. Beside me are members of one of the organizations that helped with the call for participants. All four of us agree on the value of the project: in just a few days, they have brought forward a useful proposal, with only the necessary resources and a vast application scope. The simplest ideas can yield the most spectacular futures.

## The Presentation

Back at the rounds of presentations, a couple introduces Perceive.me, a website that shows the photo of an anonymous person and allows the user to write labels based on his or her appearance. Later, the page shows the individual's biographical information, permitting the person who commented to verify whether his or her judgments were accurate or not. "This way we show the enormous gap between reality and prejudice," say Victor and Zura, who are in charge of this project.

Another exercise with a social approach is *Machitos Feministas* (Feminist Machos), a type of mix between a video game and interactive installation that poses situations through gender-focused questions. For example, an illustration shows a man smacking a woman on the bottom; the following scene shows the opposite situation. The game doesn't issue the results until the end, highlighting the user's inconsistencies in differently judging particular situations in accordance with gender. The members of the group see their project as a way to raise awareness among young couples, as well as a way to collect information towards better understanding contemporary relationships. 'We imagine it in the Museum of Memory and Tolerance,' they conclude in the presentation.

'It's called Higgs, after the God particle,' a video game animator tells me when I peek over his worktable. He shows me a 3D image of a plant whose roots envelop Planet Earth. His idea is fascinating: to create an art installation that allows the plant to react onscreen through the use of sensors. For example, if a heat source approaches the sensor, the plant will burst into flames; if a bit of soil or water is placed on another one, the illustration will show a positive reaction. Unfortunately, by the time the presentation comes around, the prototype still has a compatibility problem and isn't yet ready; they haven't successfully got the sensor to communicate. The plant remains on screen, dancing, awaiting a change that will never come.

At first glance, the *Guía alternativa de la ciudad* (Alternative Guide to the City) seems like yet another mobile application in the style of Foursquare. However, what the team – Luis Noé, Emanuel, Eibram, Jonathan, and Marcos – has in mind is far more ambitious. 'We want to create trips around places that people love,' they tell me when I sit to talk with them. 'We want the users to put in places like where they had their first kiss or where to find the best quesadillas.' The project seeks to situate hyper-specific spaces within the city, to share experiences that aren't mapped with a commercial application.

The other aspect that stands out to me is a small, greenish, apparently insignificant object. I pick it up and turn to look at one of the team members. 'Where did you get this?' I ask him. It's a beacon, a small device capable of sending a low-frequency Bluetooth (BLE) signal. He tells me that he imported three from the US and that he'd like to implement them in something. 'This technology is still in diapers in Mexico,' he says.

A beacon triggers actions in a mobile phone according to its proximity, which is why it would be logical to use it in a project like the *Alternative Guide to the City*. Perhaps it could be used to indicate when a challenge has been met; perhaps it could substitute manual check-ins or help monetise the application through special offers or advertising deals. Ideas still in progress and impassioned discussions that, I hope, won't simply remain in those incipient stages.

## Dreaming of the Future

'This is Spotify for dreams,' a young man tells us from the stage before he puts on a strange pair of glasses. It's a wearable device that improves the quality of dreams by using coloured light patterns. By now it's almost 7pm; this is the last presentation. The wait has been well worth it: *7 Sueños* (7 Dreams) is the most-applauded project, and it's also the most ambitious, the most multidisciplinary.

On Saturday afternoon, I see someone very diligently covering a pair of glasses with purple tape. I approach to check out his workstation. He's placing an infrared sensor on one of the lenses. He explains that the sensor will enable scans of REM sleep. This is the stage in which dream sleep is most frequent, when a person's brain is in a phase of rest. When you put on the glasses, the sensor begins to scan your ocular movement. As soon as it detects REM sleep, a series of LED lights begin to issue colour combinations. These patterns induce a kind of dream state in accordance with the environment produced.

They've been researching this subject for seven years, one of the team members tells me. Although the original goal was to produce lucid dreams – those dreams in which the individual is conscious of what he or she is dreaming and is able to alter internal logic – they realised that using lights could have a better effect on the quality of rest. While the person's eyelids remain closed during the process, the eyes are capable of detecting such variations. Why not put them to good use?

The idea goes further: to place sleep stations in public areas around the city in which people can experience this technology. The cabins would include pre-charged permutations of light patterns (or playlists; hence the comparison to Spotify) that could be stored in the cloud and shared. Can you imagine a world in which you could choose the kind of dream you'd like to have?

That's what *Digital Futures* is all about: taking control of our own dreams through cooperation, innovation, and technology. Taking control of the future by writing it, designing it, creating it. It's not just giving ourselves the opportunity to dream; rather, it means taking on the challenge of rendering those dreams concrete, tangible. A digital future made possible; a digital future conjugated in the present tense.

*Translated by Robin Myers*



UKMX link from Laboratorio para la Ciudad to Small Society Lab in Dundee.



## Vanguardism Of The Periphery

### The Route

Behind the counter, Mr. Sulca shows us several newspaper clippings. The periodical runs a story following one of his projects: a stimulator for the nervous system which combats Parkinson's. 'It is one of my obsessions,' but not his only one. The small local operation located on Mesones 14 is also a laboratory. 'Everything is up for sale; everything I made myself' he boasts to Jon Rogers, Professor at the University of Dundee, who examines and touches each apparatus. 'You have to see this,' he calls over to Laura intrigued. As if that were not enough, 'It uses Eprom - hat's off,' declares Erik, a worker passing by. Indeed there is no doubt that Mexico City is a laboratory - it has been that way since its foundation. The Route of Makers that we tread today is only a walk through the palimpsest that gives life to the Centro Histórico (Historic City Center) and tells a story forged by workers from an ancient Mesoamerican world who confronted an Old World to invent a 'New Continent.' What better stage to explore the digital future. That's what brings us here.

Patricio Buenrostro, a futurologist and self-professed entrepreneur, is one of the guides along the Route of Makers, organized by the Laboratory of Mexico City to initiate this Mexican-British dialogue in which gamers, makers, creative minds, and navigators of the latest technologies will reinvent the now in order to transform it into a prototype, story, game...or into an experiential situationist narrative like the one played out this morning in the Plaza Tlaxcoaque. In Mr. Sulca's store, this transformative movement is touted almost like a Maker manifesto.

We Mexicans retrace our history along this route which directs us through a center which is part of our living legacy. To the British, it is known as the great twenty-first century Tenochtitlan, through which the vision of that ancient city still seeps phantasmagorically. Each traveller marks her own path. On the avenue 20 de Noviembre mannequins dressed like brides direct us to the right towards the street, Regina. We arrive at Pino Suárez where all worlds converge: architecture and the work that we have been performing since the start of our history. If there is anything Mexicans know how to do, it is work. We are workers.

Turning left on Mesones there are churches, cantinas, hardware stores, fabrics, notebooks, cables, imitation jewellery, buttons, bottles, bows, stamps, paints... which draw a new face on the center that seems to be a massive library of tastes and interests. And indeed every street is a specialized branch. This dazzles Irini, who is perhaps 'responsible' for this discovery. Neither she nor Jon know which way to turn. Neither does Erik, a young inventor of barely twenty-two years; nor Dulce, a forward-thinking architect; nor Laura, a Mexican graphic designer and alumna of the University of Dundee; neither

does 24 year old Andrés who has been writing an essay the last few years 'on the new paradigms,' which he only revealed upon our entrance to Mesones 14. There stands Mr. Sulca behind the counter of his miniature store, barely announced by a tiny sign that reads 'Electronic kits, Sulca interior 2.' This sign transports us back several decades but, once inside, forward into the future. 'I have designed everything,' and this everything includes programs, apparatuses, electronics... 'For over fifty years I have been inventing and investigating.' These products do more than operate; they boast a fun and functional aesthetic. What's more, they confirm a premonition by George Orwell in his book *1984*: 'If there is hope (wrote Winston) it lies in the proles.' This reality continues to ring true upon arriving at Lázaro Cárdenas, where the din of voices asking us what we are looking for, whether it's hardware or software, whether filemaker or Photoshop...are only the antechamber to a universe in which any kind of computer or dream is possible. There are pirated products, reinventions, recyclables, assemblies, keyboards, cables, chips...everything to build for any pocket. People, shouts, display windows, cables, monitors, keyboards, programs blend together into an electronic Meccano that invites us to also build the impossible. Welcome to the vanguardism of the periphery.

Crossing the avenue of Lázaro Cárdenas we follow the path of Patricio towards Victoria (the street with the lamps), and then later, along the street Dolores (the eastern gem) we cross Artículo 123 (famous for electrical appliances and also for the start of radio in Mexico) until arriving at China Town. On Avenida Juárez, facing the Alameda and the Palacio de Bellas Artes, we opt to return through the 'center of the center' via the street Madero, which introduces us to another city in which businesses, banking, and transnationals flank us. We take a turn onto Bolívar, but escaping from the gentrification poses more than a challenge – it requires much imagination. The street of Donceles, though a bit overly renovated, is crafty and has managed to escape the bourgeois trend that nowadays typifies the historical centers of the great metropolises. Here old and used books continue to be found in print and share their nostalgia with photography stores where analog cameras prevail. Along the street Palma signs reading, 'We print theses,' indicate that we are near the end of the route: the Plaza Santo Domingo. According to a futurologist like Patricio, this street triggers nostalgia provoked perhaps by the printing houses which specialize in 'almost customized' invitations for weddings, la quinceañera (Mexican celebration at the fifteenth year of age), baptisms, pamphlets, flyers, diplomas, university degrees, posters, along with the vigilant watch of the Iglesia de Santo Domingo (Church of Santo Domingo) and the old Escuela de Medicina (School of Medicine) and its Palace reminding us of the glamour of the vice-royal period.

### The Binnacle (Housing for a ship's compass)

From the green terrace of the Laboratory of Mexico City, the historic center is organized in a grid that seems like a live miniature. From its heights we re-traverse in our imagination the routes of makers of other centuries. On the roof of the Laboratory we take on the 2015 Dual Year of Mexico and the United Kingdom.

These are the moments leading up to the inauguration of the Digital Futures UKMX challenge. It's not every day that one gets to converse with a UNESCO City of Design such as Dundee, nor to interweave the creative ecosystems of two apparently unconnected places. What could a Scottish city with barely 150,000 inhabitants possibly have to do with a megalopolis of more than 20 million? We begin to discover in a video-table conference in Spanish and English, the curiosity that will write the first paragraph of a shared creative ecosystem. The discussion about this trade of ideas was energizing those present to now begin another project: the growth of a rhizome sprouting organically from the Binnacle of Makers (Bitácora de Hacedores de la Cuidad de México), an experimental project which sows a network to teach the citizen-users of Mexico City how to better use resources and spaces to Make. But this goal invites those both here and those there on the other side of the Atlantic to experience daily life from a different perspective. More than a cultural test per se, we are the reflection between Dundee and Mexico City. The experiment has just begun.

### The Date

Along Paseo de la Reforma two giants chat: a skyscraper and a monument-sculpture-screen. They are as different in form as what they contain inside: the skyscraper guards banking secrets and the monument, named Estela de Luz (Stele of Light), holds curiosity – in the heart of it lies the Centro de Cultura Digital (Digital Culture Centre).

The hustle and bustle outside doesn't even compare with what lies inside. On the street, some people run to catch a bus, others ride a bike. It is 4pm on a Friday, and down below the first guests arrive at the creative celebration. Makers, gamers, tipsters, artists, musicians, scriptwriters, and architects... Laura, Dulce, Erik, and Andrés are there as well to take part in this 48 hour marathon. The attendees slowly begin to make themselves comfortable. Some drink coffee and others tea. Some begin to spread themselves out along the tables: they take out their laptops, remove their shoes, chat, and settle in. It is like looking for a partner to dance with. The orchestra – the hosts that is – are tuning their instruments, and the guests are adjusting their suits and ties. Everyone looks around at each other: anyone could be the perfect partner. Who will they dance with?

Not all are 'strangers.' Many are already regulars of these creative get-togethers. This is reflected in the familiarity with which some greet each other. No one is too intimidated; the novices quickly learn the code, and the dance continues with the promise that the best prototypes will be exhibited in September at the Victoria & Albert Museum's Digital Design Weekend in London. Grace Quintanilla, director of the Centro de Cultura Digital, wanders about spying with her iPhone on the participants and guests like the British musician Trevor Wishart, who pokes around near his display titled 'The Resonance of Things.' Grace doesn't stop; she is as eager as the participants, many of whom are first-timers in these undertakings. They don't know what to expect, but they wait hopefully. And they are not mistaken. Jacinto Quesnel is in charge of the proceedings. She first presents Jon Rogers, professor of creative technology, who along with Irini Papadimitriou, Digital Programmes Manager of Victoria and Albert Museum, is the reason behind this meeting. They are the guests of honour at this technological celebration. But they are not the only British present; in Dundee other maker colleagues are also inventing new ways to live the city – in a marathon dialogue.

The rules are established and with the premise of finding partners, the activist-makers develop the functional prototype that corresponds to one of the four guiding principles of work (civic consciousness, commitment, collaboration and innovation), and launch themselves towards the dance floor where around them advisors circle. They say there is always a lid for every pot, and this Reality Check is no exception.

#### **Put a Sock In It**

I leave Laura, Andrés, Erik, and Dulce at the CCD. It excites me to think that they have found others who will invite them to dance for the first time in a marathon of this sort. I know that guided by advisors like Héctor Rivero and El Mitotero, they will join this clan of makers that have decided to use technology to tell stories and later to share these stories to help others understand technology. Each one, amateurs and those more experienced, will find a path to narrate whether through a new app, an object, a game, or sound – and what's more, a story that will have an application in the community and foster the gathering of discoveries just as the Astro Vandalist, Interspecifics, MusicMakers Hacklab, and the Colectivo Chipotle Collectives will do in the Laboratorio Arte Alameda (Alameda Art Laboratory), Evening of Chiptunes, the poetic-sound-visual jam – interdisciplinary ventures that play with other tools and instruments in order to make music.

#### **Futurizing**

Dulce is right – the goal of this marathon is 'the enjoyment of helping and growing.' Mission accomplished: the Digital Futures are narrating.

*Translated by Anya Russian*



## Under Debris And Over Engagement – The Shift Of Civic Engagement In Mexico City

Thirty years ago, the morning of the 19th of September, Mexico City woke up early to the frightening shake of one of the world's biggest earthquakes. In less than five minutes, the 8.1 magnitude movement crumbled a vast part of the city center and its surrounding neighbourhoods. It was the biggest tragedy the modern city had ever lived. The promise of progress and profit from the welfare state was pulverized to pieces leaving a city of 9 million people with the uncertainty of the unknown. The deaths are calculated at 10,000 although the number differs depending on the source, Red Cross said in 2012 that it could have escalated up to 15,000. Mexico City was not prepared for this. Every protocol had to be improvised.

While the government organized its hospitals, its diplomatic relationships and calculated the damage, it was the citizens who were coming together to overcome adversity. The organic constitution in committees soon had an established system that was able to count missing persons, clean debris, rescue victims and channel them to hospitals. Citizens were shaping the solutions. By the end of the week, a citizen organized group later nicknamed as *topos* ('moles', a concept coined due to their capacity to dig inside the earth and save victims out of the ruins) became the official rescue team of the crucial tasks. The federal government was harshly criticized for its slow reaction and its lack of planning for the unexpected. It was clear for everyone that the System alone was not enough, it had enormous shortcomings. People took the city into their own hands and the true colours of resilience started to emerge.

The turmoil of 1985 was the deciding moment for Mexico City when citizens demanded change. The city needed more than physical reconstruction, it urged for social glue and a shift in paradigms, there was a big task that implied rebuilding the trust between citizens and governments. It not only had to do with the practicality in resolving urgent matters, but in designing better solutions jointly. Back in the 1980's the dusty Mexico City didn't have a meaningful ecosystem of NGO's, proactive citizens or a conscient government that understood the importance of citizen solutions, the earthquake marked this split, practically and metaphorically. It's easy to say, but thirty years have gone by since that first approach to an improvised but solid exercise of civic engagement. With three decades separating us from that crucial moment and an important gap in generations, the question is now not if citizens can engage in civic matters, but what has the city learned and taught throughout the generations? A lot. NGO's that were born in that moment now continue to run and have been able to change security protocols, in architecture and health matters. One of the biggest problems regarding the slow response was the political organization of the city that depended on a Federal apparatus and didn't take decisions on a local scale, public positions were appointed directly by the president and these in turn elected their own administration.



1985 was a moment that made clear the city had to be able to take decisions quicker, in a local organization and not a federal one, and that is why the first model of a democratic city government was elected in 1997. This shift towards a more autonomous metropolis and the consolidation of a progressive model acknowledged civic organizations to take part inside the government's decisions. Proof of the maturity of this model is Laboratorio para la Ciudad (Laboratory for the City), a new and young innovation office inside the Mexico City government.

The Lab for the City was born within the governmental structure in March 2013 with huge expectations. Although it was conceived as part of the city government it was leveraged by a group of young people with very diverse and professional backgrounds who were born circa 1985, 'the generation of the earthquake'. A generation who grew up shaped into the scepticism of a trustworthy government and the fail of postmodernity but also, constantly reminded of the power that society has when it's organized and it engages in civic matters. A group of young leaders who acknowledge the premise that if they wanted things done they had to do it themselves. Lab for the City was born to tap into the talent and willingness of these young profiles, proactive and autonomous citizens who believed change was possible and it was just the right climate for Mexico City to shift the notion of the broken system.

The Lab has been running for almost three years now, and civic engagement is one of its core principles and work axis. Through civic engagement the Lab has been able to collect, insert and produce citizen ideas into government. Connecting cities and citizens through government itself is what drives the work at the Lab and it is not only a matter of delivering better services but rather reimagining the role of government and how it can contribute to build a better city. The Lab continuously explores ways to create better channels for engagement that didn't exist before not only locally, but internationally. Now it's not about how many projects can a city office produce, but rather how many mind sets can it incubate for change.

Through the empowerment of creative communities, the implementation of open government strategies, the digestion of a shared economy, the sharing of international good practices, the Lab has begun the change. Long gone are the days when the government's promotion of its public programs didn't call for civic engagement. Today, it is a normal process for savvy citizens to shape their start-ups with government possibilities. It is the democratization of participation. In order for Mexico to gain a pin on the international map it needs to convert its efforts into internationally recognized public policy and therefore continue to engage with international actors. Digital Futures for the Lab means the possibility to re imagine contemporary civic engagement.

The new agora for civic empowerment now is not only in the streets where it was thirty years ago, but we now have a digital future where society is woven into more powerful movements and lessons. In our Digital Futures citizens can connect to resolve bigger issues, to learn the differences and similarities between cities like Dundee with a population of 140,000 inhabitants and Mexico City with more than 20 million. Digital Futures means speaking the same language, fighting for the same causes, recognizing we all have common problems and savvy solutions. Civic Engagement now is not only local but global, with shared solutions and best practices. Thirty years ago and under the debris Mexico City had its first demonstration of civic engagement that shaped the possibilities of the contemporary city, now Mexico City is constantly being shaped by all the voices that help reimagine the role of citizens with their city and their government.



Looking north over Dundee showing the waterfront development and site for V&A Dundee.

# Dundee x Mexico City:

## A Digital City Cultural Exchange

Cities around the globe are actively searching for solutions to big societal issues of poverty, growth and sustainability. Large capital cities are often viewed as leaders in developing these technology driven solutions; however increasingly cities/towns of all scales are developing digital experiences which involve and enrich citizens lives culturally, beyond civic apps.

In Dundee we believe that citizens, artists, designers and technologists play a leading role in shaping the future of our city – therefore this was the starting point for this year's Small Society Lab in Dundee. The Small Society Lab is an open project which explores the development and understanding of the small city of the future. The Lab, now in its fifth year, is a partnership between Dundee Contemporary Arts, the University of Dundee and Creative Dundee.

In June two seemingly unconnected cities, with active maker/digital communities, came together to run simultaneous events to share a crossing of cultures digitally – Mexico City, a megalopolis with 22 million residents and Dundee, with 147,000 residents. From independent shop owners to retirees, people joined the two day lab events in both cities – a chance to share and learn from the cultures, streets, design, food, music, art and lifestyles – exploring the amazing rich tapestry that makes up all aspects of life in our cities, large and small. The groups remixed both cultures to design and create collaborative and experimental projects which considered issues relevant to city life; such as civic engagement, the environment, the high street and food production/waste.

### Collaboration across continents

Open digital platforms were used to enable communication between the groups before, during and after the event; and the cities crowdsourced aspects of their culture – videos, photographs and stories – with each other in advance through shared folder access. At the start of both events, each group went on walking tours of their cities. Everyone had the chance to guide people around their own hotspots and least favourite areas – this provided inspiration and a chance to get to know each other. Open tools such as Periscope were used to live stream and video conferencing platforms enabled a good forum for discussion around the similarities and differences between the two countries creative economies. Working around the slight six hour time difference challenge, participants in both cities were keen to connect and share with each other. Digital connectivity provided a valuable, fast and cost-effective way of exchange and collaboration between the two maker communities.

### Fusion food and Mexican waves

The Lab conditions were relaxed – the walls were used as giant sketchpads and it was interesting to see how this permission immediately changed the tone of the event, with everyone keen to scribble their thoughts on the white walls. Throughout the Lab, caterers provided amazing Scottish/Mexican fusion food to get everyone in the collaborative spirit. A local storyteller joined us over lunch to tell us some tall tales which were both hilarious and unrepeatable – the perfect combination for keeping energy levels high. Before all groups presented their final ideas to each other across the continents, one of the warmest moments came when our friends in Mexico City started a Mexican Wave. Without much of an advanced notice, the team in Dundee automatically continued the wave across the video conference screen. As most in Dundee were not 'digital specialists', in a world obsessed with what new tech comes next, it was a great reminder that technology's real gift is its ability to enable genuine and accessible shared experiences.

### Designing the fabric of the city

Dundee's cultural identity is strong and its communities of artists, designers, developers and citizen groups have always been very active for a city of its size. The city was recently designated as a UNESCO City of Design, due to its rich design history, current scene and future trajectory. With a huge waterfront redevelopment underway, the V&A Museum of Design Dundee opens in the next few years and there are also a number of other exciting initiatives in progress. It's perhaps no surprise that the projects developed at Small Society Lab were around making the city more engaging and playful. Coincidentally most groups considered how the city was positioned, communicated and connected.

### Projects developed

*A Postcard from Dundee* – a short film produced from crowdsourced content received by Dundee's citizens. This film offers an alternative to the usual way cities promote themselves, by harnessing content generated by the people that live there and know it best.

*City GIF Wall* – creates a new way for a number of citizens to engage with the city playfully, projecting their short form video clips about the city on to city walls, showing the city's vibrancy and personality in a highly visual and accessible way, as an alternative to advertising.

*Follow Me* is a digital platform to share and find places, events, tips and tricks that you enjoy. When visiting a new city, Follow Me gives you a virtual tour of the city from the local people who know it best, just like a close friend would do.

*Mexi-Dee* – a fictitious city was created by overlaying aspects of both cities together and 3D printing prominent landmarks on to a wall map. People were invited to draw their ideal features on to this new city using tag tool technology. The aim? To encourage people to consider the built environment, using accessible street art techniques.

*Wordhunters* – Initially inspired by a set of images of words from Dundee's street signage, the group transformed these into a jointly authored 100 word poem which can be reconfigured to create new poetry depending on the individual's preference.

*Project V* explored ways of combining technology and local food producers to make the basics available locally and conveniently. Connecting local producers directly with localised and isolated communities for everyone's benefit, by using vending machine technology on hyper local streets.

#### Small can be practical

Disruptive and innovative ways of working often come from the fringes – small organisations, start-ups and activist groups who have the agility to be responsive and make things happen quicker, without bureaucracy slowing them down. How smaller cities and towns 'do' disruptive well using digital is still possibly too early to tell; however from the south of Italy, to the north east of Scotland, forums and platforms are being created to consider the digital fabric of place, bringing people together to explore issues and opportunities specific to living in smaller communities.

Using technology both as a leveller and an amplifier in this project, reduced the geographic barriers and enabled Dundee to share its ideas and expertise with a megalopolis like Mexico City. It has been a valuable way of developing an understanding of other people's lives who will probably never meet in person. Small projects like this may not solve cities systemic problems overnight, but they do have the potential to be transformative by creating a sustainable momentum with the community and culture at the core, which feels a small but important step in the right direction.

'It was wonderful to collaborate with our own creative community in Dundee with thoughts fixed on the amazing Mexico City with its vast scale and rich culture. As a game designer it was good to see how many like-minded people in Mexico were using the medium of games to tackle social issues and that's something we aim to do more of in Dundee. Playfulness is a great way to address the many issues we face in our society. One of the many ideas that came out of the experience was a way to share interesting parts of our local environment through digital technology and art. Be it short animated GIF animation on a website or an app that customised a visitors experience.'

(Malath Abbas – Game Designer, Dundee)



## Interspecifics, Astrovandalistas, MusicMakers Hacklab & Colectivo Chipotle: Maker-Art-Collectives From Mexico

Apart from purely conceptual artists – who are quite a rare species – all artists are makers. Nothing compares to the feeling of inventing something and constructing it; it is in our ‘nature.’ However, the act of making seems to have been taken away from the hands of everybody and, gradually, the role of the maker has been assigned and reduced exclusively to artists and craftspeople. The homogenizing drive has almost erased the workspace and typing now seems to be the handiest activity in many people’s daily life.

In the meantime, our planet’s stability has reached several critical points that call for everyone’s participation. Sustainability is the key concept if we want to continue to populate this world, and collaboration a necessary condition for including everyone in the plan. How can we learn again to do so? Artists – like everyone else – need to ask and seek for the answers, and some of them are really doing it well.

Trying several forms of collaboration, investigating a multitude of key topics in a plethora of disciplines, experimenting with models for our environment’s sustainability, prototyping, building, and having fun doing all of that – the forthcoming revolution, expected to be focused on labor, has a different tone this time. Our motivation on this occasion is not supported by the idea of progress but more precisely by that of survival; the question is, how can we make it possible.

For the Digital Futures event in Mexico City, Laboratorio Arte Alameda invited four influential maker art-collectives: Astrovandalistas, MusicMakers Hacklab, Interspecifics, and Colectivo Chipotle. With different approaches to Maker and DIY cultures, and coming from cities all around Mexico, their practice is based on research, action, making, and sharing knowledge. We happily share with UK makers a brief profile of each art collective.

Astrovandalistas was founded in 2010 in Tijuana, a city in the north of Mexico on the border with the United States. With a singular relation to technology, Tijuana is mostly a city of “maquiladoras,” in which large-scale industries such as electronics, aeronautics, energy, and the like have established thousands of assembly plants. Astrovandalistas combine research, artistic action, and experimentation with different technologies, activism, urban hacking, and open knowledge. They operate as a decentralized laboratory in different locations in Latin America, such as Mexico and Brazil, and the United States, developing low-tech tools that enable new forms of communication and collective participation with open software and open hardware that can be easily replicated.

MusicMakers Hacklab is a week-long open collaborative laboratory focused on the transdisciplinary exploration of possible relationships between body and sound, hosted by Peter Kirn of CTM Berlin, and Leslie García/Paloma López in Mexico City and Tijuana. During the MusicMakers Hacklab week each of the participants builds systems and instruments based on processes like sonification of biological organisms, aural and sonic stimulation, and the

amplification of body sounds. At the end of the laboratory participants show their projects at a live act. MusicMakers Hacklab has released the recorded pieces in wonderful cassette editions, and has produced a printed publication with the participation of young researchers and critics who wrote about the multiplicity of processes that took place during the event. The questions and explorations proposed by these collaborative and open laboratory dynamics trigger very singular experiences that enable us to see the importance and enormous potential of artistic research in understanding and inquiring into our present.

Interspecifics is a multispecies collective experimenting in the intersection between art, science, and technology, which embraces hybridized practices among different disciplines and living organisms. This collective is interested in the exploration and experimentation in hybrid systems that connect bio-organisms and machines. Some of their projects include The Energy Bending Lab, an instrument comprised of a set of custom-built modular synthesizers and transduction tools that create real-time sonification from the electric properties found in some bacteria. Through the use of cymatics – visible frequency vibrations – it is later converted into a visual pattern generator. For us at Laboratorio Arte Alameda it is of great interest to be close to what new generations of artists are thinking and enquiring about life. The DIY approach to these practices results in a very effective way of sharing and opening up what otherwise would be a quite closed kind of knowledge. It is amazing to see how the so-called ‘general audiences’ can learn about some of the ideas in this new understanding of live processes, which are key to understanding our present and exploring what life may be like in the future. Interspecifics’ experimental and artistic approach is what makes this process so exceptional and a very different experience from learning about synthetic biology through formal methods.

Colectivo Chipotle gathers visual artists, programmers, cultural producers, and musicians, who share an interest and life experiences in video games, informatics aesthetics and 8-bit music. This collective organizes Format DF, the first annual chiptune festival in Mexico City with guests from different countries. Chipotle regularly organizes chiptunes and circuit bending workshops. Format DF is an open access festival offering great experiences centered in the experimentation with 8-bit sound as well as hacking and circuit bending old toys for lots of young musicians and music lovers.



*Francisco, Salvador and Martin demonstrating 'Linking Places' in Memorial Room at the Centro de Cultura Digital.*

# A Connected Sense Of Place

In June 2015 we took a whirlwind trip to explore open collaborative making with designers and makers in Mexico City. The prototyping marathon brought people together from a wide variety of backgrounds. Creatives working with engineers, makers with anthropologists and researchers with programmers. The brief was simple: to design and prototype ideas for improving cities across the UK and Mexico.

We set out to explore how connected objects could allow cities to become more playful, to give people living or travelling through them a better experience. To create not just any digital futures, but playful digital futures, that could let places become more memorable, and improve the experience of places through design and technology.

We had a simple idea at the start of the weekend, to link Mexico and the UK through an abstract physical object that communicated with light. Although the UK and Mexico are over 5000 miles apart, when you think about the sun being over 95 million miles above us all, we're actually pretty close. We thought light could be a powerful way to connect across timezones and continents. If you imagine yourself orbiting in the International Space Station for a moment, you would literally see sunrise and sunset falling across different parts of the earth. We were intrigued to explore how we could visualise connections between places when you aren't not orbiting planet earth.

Over the 48-hour prototyping marathon at the Centro de Cultura Digital we created concept prototypes that communicated some contextual information from a place through light. One of the concepts was a prototype that could measure light levels in a place in the UK and visualise them in a compelling, stimulating way in Mexico City.

We created a pair of objects that could measure light levels in one place and output them on another object connected over Wi-Fi. The next step was to create an amazing output for the light level data. Centro de Cultura Digital has an installation space called Memorial Room, an incredible sound and light installation surrounded by RGB LED's. Entering the space, makes you feel like you're standing in an immersive, interactive pixel cloud. We worked with Francisco and Salvador at the Centro de Cultura Digital to connect this room to our simple light sensor prototype. They built a protocol that allowed our concept prototype to talk remotely to the arrays of controllers that could turn the room any colour imaginable.

To demonstrate the prototype, we put the light sensor in a small cardboard box. Standing inside Memorial Room and covering the opening in the box turned the lights out completely, plunging the room into total darkness. Removing your hand from the top of the box brought the red light levels up gradually, and the whole room could burn bright red by shining a torch into the box.

The next step for our thinking is to create two objects that link places together with the inputs and outputs built into the same object. We'll also be exploring adding other sensors and interactions into the concept objects. Possibly temperature sensors, proximity sensors, weather data or physical inputs, such as knocking or tapping the device to send a message.

This was just the start of our exploration into connecting communities and understanding how connected experiences can help express what a city stands for. Our recently published research paper explores in more detail the important connection between the Internet of things and placemaking.



## A Sense Of 'me' On The Connected High Street

The High Street. What a familiar term. If you're British it raises many different thoughts – from memories of teenage dreams to boarded streets paved with pound-shops as the brands have long left for 'out of town shopping'. For some this highly British definition of the main retail district, is perhaps a social barometer of Britain as a whole. That somehow the demise of the high street represents something bigger, scarier and altogether rather depressing. Yet is this the case? What if the High Street has just shifted, not to ring road warehouses, but to the smaller streets just off the main street, forming something as much as a place to go to shop as it ever was? That it is exciting, or possibly more exciting than it has been in the history of centralised retail...

With such changes a-foot, we wanted to view our High Street through a different lens. A very different lens from a country that formed part of the largest 'high street' in history – the 4,000 mile silk route that had India in it's prime position.

As part of the Unbox Festival 2014 we went to New Delhi to find out more about what a main retail place is and how alternative economies to ours operate. Prasad Shetty and Rupali Gupte, from the Bangalore architectural collective CRIT, took us on a walking 'tour' of 1980s urban retail district, Nehru Place that 'seems to be configured through a complex interplay of messy claims, shrewd enterprises and absurd obsessions.' It was an incredible location and very hard to describe. Perhaps if Ridley Scott created a shopping experience for ten thousand people from concrete 1980s building blocks you might be somewhere close. Primarily a technology retail area, each shop occupying a three meter cubed space selling just one type of hardware – one cube might be hard drives, another mobile phone screens, another batteries. But most startlingly Nehru Place is brought to life as an interconnection of things by a complex human network of pavement gofers who hook up products and services for a buyer from across the vast array of cube shops as fits their needs. And in the middle of all of this we met the artist Gagan who decided to locate his studio in the middle of a twenty story high concrete slab. To fund his practice he did something really rather remarkable. By observing that the communications in this urban cubic 'mess' were difficult – (mobile phone signals failed to penetrate the buildings and WiFi networks could not cope with the density of demand) – he created his own traditional landline phone network and signed people up. He now has over 1500 traders using his GaganNet – a 4 digit dial up landline, charging a small fee (200 Rupees a month) that allows him to produce the art he wants. It's a remarkably simple solution to connectivity when traditional digital solutions don't work. It reminded us of the importance of networks and how people need to be connected – and that it doesn't have to be through a touchscreen or keyboard.



This thinking is the kind of thinking that the Internet of Things surely needs? The rather depressing thing at the moment is that if you do an image search for 'Internet Of Things' you are faced with pages of thumbnails of corporate diagrams about the size of the market, the potential, the promise and the technology. What do you don't get is any 'things'. It would be very easy to make the mistake that the Internet of Things is a corporate spoof – sold to us through illustrated diagrams of keys, buses, light bulbs, the globe, houses, planes, plants, radios, televisions and even an ironing board... There is, as our good friend at the Met Office Mike Saunby is quick to point out, – 'nothing new there'. It is all about retrofitting new technology to existing products. Something that didn't happen when paradigm-shifting technologies such as television, radio, printing and the axel arrived. This sets out a grand challenge of what entirely new things can, and should, be designed that harness the internet in physical objects without screens.

Uniting the experience of the high street, or Chowk from India with the challenge from Michael Saunby of creating entirely new designs that harness IoT, we explored the idea of creating a physical social-network for a group of independent shops/cafes in Dundee – which we're thinking of as a tiny social-network – possibly the world's smallest!

It's a network of small till-roll printers that are connected to the web, powered by the amazing Electric Imp. We're calling them TapWriters. Because you tap at a screen and it comes out on paper – on all of the rolls at the same time. It's changing a printer from a printing appliance into a social media device – paper is the media rather than Facebook's or Twitter's screen. This limits resources (Katy Perry and Ronaldo would run out of paper pretty quickly...). We've created a social feedback mechanism by having a single button that you tap as a form of 'receipt' – a deliberately ambiguous interaction that is neither a 'like' nor a 'thumbs up/down'. It's simply a response that is printed across the small network. We've installed eight in small shops, cafes and a yoga centre in Dundee. And we're watching to see what happens.

So how does it work? Mike's been playing with the till rolls connecting to Imp using code from Instructables. An amazingly powerful feature of Imp is that it handles Http messaging and is super straightforward to have all of the printers connected in a network. So this is great technically. Yet the thing that got us most excited is the scalability that Imp provides. With so few components in the TapWriters and the cost and scalable tools Imp has for mass production, we're almost ready to go live with a product...a physical social network that connects people through paper.

But in designing networks are we missing something? Are we missing a sense of 'me'? In the high street are the big brands also forgetting this? Perhaps that's why so many of us are reaching for smaller independent shops and cafes for crafted personal experiences? The high street is far more than a place to buy stuff. After all it's those teenage moments of trying on the clothes of our alternate future selves, buying music, queuing for cinemas, sitting on the town square and eating fast food on plastic trays, that we all experimented with to find out both how to be social and who we as individuals wanted to become. It's not big data we want from IoT it's personal experiences.

With this in mind, we're interested in how IoT in our shops could do something intrinsically more human for individuals. At the optical boutique, Spex Pistols, in Dundee, we're working with owner, Richard, to build atypical personal experiences for his customers and visitors. Two things you should know about Richard: fact 1 he is a massive Smiths fan and his shop is full of music memorabilia; fact 2 he loves capturing curated photos of his customers in his shop. His is somewhere to go when you want to find beautiful glasses, both vintage and contemporary, that are not boring. Richard associates music, personas, eras and icons with most pairs and has filled his shop with the music and iconography to match.

In response to this, one piece that's in early prototype stages is exploring who we are, and who we become, when we look in the mirror and when we try different glasses on. It is a piece that only functions when someone is alone in the shop (and Richard is upstairs in his mezzanine workshop, as is often the case) and is somewhere between a magical fairytale mirror and a photoautomat, that uses cloud-based photo-interpretation software to guess your age, mood and facial expression in order to select music from your teenage years. Without explicitly telling you your age, the intention is to allow people to be both prompted back to another era and also play with different personas through wearing different glasses.

We want to explore what happens when the IoT creates private, human, playful, experiences that re-engage with a time when the high street might have been one of the most formative places in your life. A place that wasn't networked, but was certainly incredibly connected and social. Which leaves us now with a tension in designing for the connected high street. Are we looking for IoT that creates completely new forms of social connection? Or are we looking to understand ourselves more? To remain anonymous if we want, but also to connect us to the things we might want or need in ways that we hadn't imagined? A lot of questions, without many answers. Which makes this an exciting time to research what we want from technology and how it fits with our lives in the messy business of being human.

*Project Team: Jon Rogers, Michael Shorter, Chris Speed, Jayne Wallace*

# Innovating The Future Of The Arts

Technology isn't the answer to everything. It's the answer to many things. What do I mean by that? We live in a society of multiplicities where solutions are always plural, there is no one solution rather it's the choices that determine the future. Innovation up until now has been about having access to resources and closely tied in with the economy. In the post-capitalistic sharing economy, the word economy itself has been innovated. With less than 3.74 degrees of separation between us, people are now the currency that drives innovation in industries.

## Conditions for Innovation in the Arts

So what are the conditions that make it possible for cultural industries to innovate? Designing innovation within the sharing economy has very little to do with coming up with something new, but following the patterns that reveal what the economy needs. Everything we have been told about innovating is made redundant within the digital-social, the sharing economy thrives on collaboration to excavate something new rather than invent it. From Instagram to Uber, Kevin Systrom did not invent photography but simply made it easy for image enthusiasts to come together in a single space, neither did Travis Kalanick or Garrett Camp invent taxis but simply made it more accessible. As much as we owe it to Henry Ford & Alexander Wolcott for their inventions of cars & cameras respectively, that's not what drives the sharing economy today. Because the conditions for innovations today are to engage not just your peers but also the community around you.

The Arts has been contending to define its future now more than ever, especially in light of digital saturation. The future is innovation, it's made up of the next big innovative idea so it's fair to argue that we should all be able to approach this notion of everyday innovation with clarity and the conditions that allow it are the same conditions that create this demand; the sharing economy.

From the rise of creative entrepreneurs to art startups, the nature & being of an artist has fundamentally shifted from a person created exceptional pieces of work in isolation to one whose success is directly linked to the digital economy. The digital landscape has not only nourished the sharing economy but also re-imagined our expectations for creative industries. As the separation between consumers & producers blur together, the creative industry has to re-envision our audiences. The very same audiences who drive change are central to innovating in the arts.

## What can the Arts do?

When we think of civic engagement or equality our minds are predisposed to believe it's purely of concern to governmental policy-makers or politics at large whereas digital engagement as a whole, which is an integral part of our present civic society is a cultural concern that we need to take seriously.

As art organisations, artists and creative professionals perhaps we are more aligned with engaging the public beyond barriers and digital space gives us the freedom to do so in a variety of ways which wasn't conceivable before. In fact, the nature of civic engagement is transformed into the everyday from initiating cultural movements with social media posts to participating in online groups that directly speaks from an under-represented community. Accessibility to technology has dispersed social engagement into the hands of the public rather than being institutionally sanctioned.

We are all deeply concerned about the future of arts but have we consciously internationalised the future lies not in a time to come but within the complexities of our collective anticipations? In response to how the future of arts will unfold within the sharing economy, that's entirely dependent upon the communities we form & the level of engagement we as individuals and as a sector curate within the digital space.

## What does Innovation mean in the Arts?

There are certainly some anxiousness around digital penetration within the arts & museums as a sector and rightly so, because the present dialogues around technology primarily place it as a solution to everything. Technology is only as good as the community behind it and when we acknowledge this, we quickly realise it isn't the answer to everything but it's answers are multitude and the ones we actively support will design the future of our industry.

It's easy to forget the pivotal role civic engagement plays within the sharing economy where every person can determine the value of a thing via a myriad of ways from an Amazon review to a blog post. Whereas the Technology Strategy Board invests over £300 million every year in what can be largely understood as innovation, the true strength behind creative industries would be to leverage communities as active digital members within the innovation process. During the initial tech burst outsourcing was the trend, imagine open sourcing ideas to design projects that is already backed by civic participation. The future of Arts lies not in technology but the degree to which we enable civic engagement that will continue to drive innovation.



*Liliana talks to Mr Sulca about his crafted electronics.*



## Datacatcher Walking Tour

The Datacatcher is a mobile device with a screen on one end and a large control dial set in a recess underneath. Short statements, derived from public and private datasets such as the census and credit agency data appear on the screen every few seconds, addressing topics including average house prices in the surrounding area, typical income, the number of pubs or of GP surgeries. Turning the dial one way scrolls through all the messages that have appeared on the device; turning it the other way accesses a set of poll questions about the area that can be answered using the dial to select among alternatives.

We designed the Datacatcher to give a sense of the sociopolitical texture of the neighbourhoods where it is used. But the Datacatcher can be viewed from multiple orientations. For instance, our initial motivation was to support an expanded view of environmental issues by linking them to related concerns. It is also relevant to current activities aimed at making data more transparent and empowering – indeed, during an early test, one participant commented that it offers ‘Big Data for little people’. The Datacatcher is part of a research project funded by the European Research Council to investigate new ways to live with digital technologies – and new ways of living that digital technologies can support. To understand the multiple points of view the Datacatcher would afford, we manufactured 130 prototypes and distributed them to people in the Greater London area, who used them for up to two months. We hired two documentary filmmaking teams to capture these experiences, and their work can be viewed on our Vimeo channel: <http://vimeo.com/channels/datacatcher>.

It is the participants’ voices that complete the story of what we have made. This is not a simple and unitary narrative, however; each one has their own version to tell, and the experiences they describe vary so widely they might be describing different devices. Rather than producing a clear account then, the voices mingle and weave to create a kind of polyphonic, fragmentary story of the Datacatcher – one that will resonate through our future research and practice. The Interaction Research Studio in the Design Department at Goldsmiths explores the design of computational systems for everyday life. Our practice-based research integrates design-led research methods with work on embedded and ubiquitous technologies to produce prototype products embodying new concepts for interaction. We don’t pursue design as problem solving, but instead design products to create situations that encourage playfulness, exploration and insight.

Because our prototypes are evocative and open ended, a crucial part of our process involves asking volunteers to live with our designs to see how their experiences evolve. The outcomes of our work include articles and exhibitions that expose our philosophies, methods and empirical work to academic, industrial and general publics.

*The Datacatcher team at the Interaction Research Studio: Andy Boucher, Dave Cameron, Bill Gaver, Mark Hauenstein, Nadine Jarvis, Jen Molinera, Liliana Ovalle, Sarah Pennington.*



## Shifting Away From Dependence On The Car: Start With Citizen Diaries

At Future Cities Catapult we are helping cities to develop new products and services to improve city life. The best way to do this is to start with the citizens themselves, through interviewing, observing and designing with them.

Recently, we've used this approach on a project we're working on in Milton Keynes. Along with Milton Keynes Council and MK:Smart, we're looking at how new ideas, technologies and data can help nudge citizens towards taking more sustainable modes of transport.

Changing ingrained behaviour such as commuting and transportation choices is complex. Not only do urban infrastructure, planning and services play a role, but so do commuter attitudes, behaviours and needs. And since commuting and mobility may vary from day to day, the team chose to conduct a digital interactive diary study where citizen participants gave permission to share the location data from their phone as well as provide personal comments in an online diary.

This gave the research three key advantages: first, citizens could capture their experiences on their phone in context as and when they happened giving the team both anecdotal 'rich' data as well as actual 'real' location data; and second, the team could interact with the participant, exchanging comments and questions 'in the moment'; and third, the team could get the crucial longitudinal perspective of mobility over the course of several 'commuting cycles'.

### **Establishing the Context**

Before looking into how to change citizen's travel habits, we needed to understand what modes of transport Milton Keynesians were currently using and why. We began by conducting a qualitative online survey about mobility in Milton Keynes which gave us a baseline dataset for context. From survey participants, social media and other networks, a core group of 14 citizens were selected to be our study group. The group was purposely made up of a mix of very different transport users with a range of attitudes and needs; from those who only take public transport to passionate cyclists, from those who drive wherever possible or those who drive only occasionally, through choice or necessity. There was an eCar driver, car sharers and a cabbie. We had a mix of ages, postcodes and professions.

### **Briefing participants**

In a briefing workshop, participants were introduced to the diary study and given an identity on Google+ and shown how to record their diary entries. They were also shown how to enable sharing the location data on their phone. The participants made their first diary entry at the briefing workshop using their mobile phone or tablet.

These first entries focussed on who they were and their normal commuting patterns. They were asked to make entries that were as visual as possible so the research team could collect even more insight, including photos, screenshots, even audio and video recordings of their experiences

#### Diary entries

The majority of study participants made entries on a daily basis over the course of 10 days. They posted pictures sitting in traffic, moving large amounts of equipment and waiting at isolated bus stops late at night. They logged screenshots from their favourite bus app, suggested improvements to roundabouts and went into details about the advantages of driving an eCar. And of course, the team had questions for them, lots of questions. Google+ enabled a 'live' dialogue around the diary entries: 'How long were you stuck in traffic?' 'How did you feel?' 'Why did you have to take all the equipment?' 'Is public transport an option for you? Why or why not?' 'Why do you think the bus stop is scary?' 'Why is this your favourite bus app?' 'Why do you feel the roundabout needs improvement?' 'Why do you drive an eCar?' Mainly just 'Why?'

The interactive dialogue, follow up and interrogation of entries every day helped to begin building the evidence base for insight on the key challenges of mobility in Milton Keynes as well as ideas on how to improve citizen's experience of getting around the city.

#### Evaluation of the diary study: Insights and Opportunities

The team scanned the diary entries looking for patterns – what were the needs of public transport users? How did these match with those of drivers, car sharers or cyclists? Where did citizens see problems and the need for improvement? How did the anecdotal 'rich' data conflict or complement the 'real' location data? How did these behaviours compare to global best practices for more sustainable mobility in other cities and countries?

The team came up with a number of insights for Milton Keynes: why citizens use and prefer certain modes of transportation, the barriers and opportunities for shifting behaviours, and finally how to improve the citizen experience of all modes of transport. A key insight centred around making transportation more flexible to give citizens more control of their commute.

The team's visual designer helped communicate the findings by creating representative user journeys showing the positive and negative moments for each mode of transport. For instance, the observation that people may use a bus to get to the supermarket, but a taxi to the home.

The full team of designers, data scientists and researchers the team brainstormed ideas based on these insights and opportunities. For instance, adding simple signage to Milton Keynes' special cycling and pedestrian 'Red Ways' pointing out the direction and distance to key local business headquarters, could not only help with navigation, but also help citizens think of the Red Ways as a commuting option, rather than only a leisure one. Alongside this one, the team created a set of 25 idea cards for improving transport in Milton Keynes.

#### Working Together

During a workshop with project sponsors MK:Smart, CommunityAction: MK and members of the council came together to review the findings and generate ideas. By using the user journeys, pictures and verbatim quotes from the diary studies, observations, and interviews, the team were able to demonstrate the insights clearly as straightforward solutions to some of Milton Keynes' problems – no guessing was necessary. They also presented the idea cards – by combining the Council's feedback, the citizen's needs and the ideas for how to improve mobility in Milton Keynes, the team now had a firm evidence base to present to the Council and MK:Smart on how to begin effectively nudging citizens towards more sustainable transport behaviours.

#### What's next for Future Cities Catapult?

As a result of the work, MK:Smart have commissioned a repeat workshop with representatives from the council, the local bus companies and citizens. Together, with expanded support from these key stakeholders, we hope to pilot some of the emerging ideas in Milton Keynes. Learning from citizens first hand – particularly through diary entries of their citizens over time – can help them to improve the city for all.

Besides presenting this work in Milton Keynes at the Digital Design Weekend at the V&A, Future Cities Catapult will also show the findings in their Urban Innovation Centre in Clerkenwell. The learnings from this research are already being applied elsewhere in upcoming work on sustainable behaviour in cities.



## Being Local And Connected

In March 2015, Newcastle held its first poetry festival. It is surprising that Newcastle hadn't had a poetry festival before, since it has been for many years a major centre of poetry and is associated with such well-known modern poets as Basil Bunting and Sean O'Brien. Newcastle is also the home of Bloodaxe Books, one of the most influential publishers of poetry in Britain, founded by Neil Astley in 1978. Bloodaxe Books has for over thirty years energetically promoted a distinctive and diverse range of new poets including Jackie Kay, Ian McMillan, Sean O'Brien, Jo Shapcott and Matthew Sweeney.

At a panel held during the Newcastle Poetry Festival, Richard Price, Head of Contemporary British Collections at the British Library and himself a distinguished poet, gave an impassioned defence of the importance of poetry when thinking about urban regeneration and the future of cities. Poetry, declared Price, is at the heart of a successful city. He pointed to the success of Bloodaxe Books in fostering the creative economy of Newcastle. Bloodaxe shows how poetry counts and how every successful city needs poetry.

I had earlier thought about the role of poetry in urban regeneration when visiting Hull to attend the Digital Utopias event organised by Arts Council England with the support of Google, the Arts and Humanities Research Council (AHRC) and other partners at the Hull Truck Theatre. Hull is 2017 City of Culture, and the latest in a succession of places hoping that culture will be the key to urban regeneration. Phillip Larkin is not the sort of person who would have been enthused by the idea of a 'city of culture' but it is nevertheless striking how Larkin was a tutelary deity for Hull's 2017 bid. Hull, Larkin declared, was a good place to write, 'for a place cannot produce poems: it can only not prevent them, and Hull is good at that'. Larkin cherished Hull's sense of being on the edge, of creativity flowing from the anomalous, marginal and misplaced. Larkin elegantly captured this liminal spirit in the foreword to the 1982 collection of poetry from Hull, *A Rumoured City* (which was published by Bloodaxe Books): 'People are slow to leave [Hull], quick to return. And there are others who come, as they think, for a year or two, and stay a lifetime, sensing that they have found a city that is in the world, yet sufficiently on the edge of it to have a different resonance'.

Hull, for Larkin, offered an antidote to the forced and contrived creativity that many modern towns seek to achieve. Hull's distinctive character has followed it into the digital era. At the end of the 19th century, city councils, reacting against the monopolies and high costs of private telephone companies, demanded the right to set up their own telephone systems. Hull was one of the thirteen councils which established their own telephone network.

Others were gradually bought out by the Post Office but Hull City Council retained its own network, so that the city has distinctive white telephone boxes, marking its tradition of local ownership of its telecommunications. Hull Council floated its telecommunications business as Kingston Communications, now the KCom Group, and KC was one of the supporters of the Digital Utopias event.

One might just see this as another illustration of the anomalous and contrary character of Hull, but the story of Hull's telecommunications has a deeper moral. It shows how building networks does not need to be simply about large multi-nationals, about building at scale. Networks can enable the local to be linked into the wider world, but still allow a distinctive local character. In thinking about promoting creativity, it is tempting automatically to start thinking in terms of a 'push' model of modernisation, but the story of Hull's telephones illustrates the viability of what Jon Rogers has called a 'pull' model of connectivity. Hull's municipal telephone company shows how the liminal and local can retain its distinctive character in an increasingly globalised and corporate world.

Creativity is seen as key to urban regeneration and development, and these aspirations are naturally strongly evident in Hull's City of Culture plans. It is easy to fall into the language of what Antonio Roberts, in a hack at the Digital Utopia event, called 'generic conference man', and there is always a suggestion in the rhetoric about creativity and regeneration that towns like Hull need to learn from metropolitan cultural elites to achieve their aspirations. Kingston Communications is a reminder that the social and cultural capital for regeneration in towns like Hull lies not in the south, but rather in the memories, stories and traditions of the city itself – in that sense of being on the edge that Larkin celebrated. There is a risk of thinking that what towns like Hull need is the magic touch of a huge international corporation; in fact what it needs is the local – the magic of the traditions behind Kingston Communications.

The Newcastle Poetry Festival was organised by Newcastle University as part of a project called The Poetics of the Archive, funded by the AHRC within its Digital Transformations theme and forming part of the flagship programme of Research Councils UK, Connected Communities. The Poetics of the Archive was a response to the deposit in Newcastle University of the archive of Bloodaxe Books in 2013 ([bloodaxe.ncl.ac.uk](http://bloodaxe.ncl.ac.uk)). Part of The Poetics of the Archive was concerned with the conventional cataloguing and digitisation of material from the Bloodaxe Archive, but the project went much further than that, seeking to unlock the archive as a catalyst of creativity. The filmmaker Kate Sweeney made some remarkable films celebrating the fascination and materiality of the literary archive, including Conversations for an Archive in which Bloodaxe poets reflect on the archive and their own practice in writing poetry. Artists such as Tom Schofield, Ahren Warner, Irene Brown and Colette

Bryce produced artworks inspired by the archive, with Alan Turnbull using old library catalogue cards as the medium for striking artworks. Through the work of Tom Schofield and Mitchell Whitelaw, the archive interface itself became a work of art.

In a book published by the project, Bloodaxe poets presented poems about the archive. Through such reflexive exercises, the boundaries of the archive shift. We tend to see archives as static repositories, tombs of memory, but the Bloodaxe project showed how archives and libraries are great quarries of raw material for creativity, invention and innovation. The Bloodaxe project demonstrates how, just as coal mines provided the fuel for the industrial revolution, so our memories and shared cultures, preserved in our libraries, archives, galleries and museums and at large in our communities, will be the raw material of our future economy. This repurposing of the archive is nowhere more vividly illustrated than in Tom Schofield's Marginalia Machine, which scans and reproduces editorial annotations from the Bloodaxe archive, transforming these workaday annotations into a new gnomic form of poetry.

Digital making and creativity seem as if they are likely to produce bland, internationalised and anonymous products, and might at first sight seem a threat to local traditions. But it is precisely local memories, stories and traditions which provide the material which feeds the creativity of local makers, writers, composers, artists and performers. This message has emerged strongly from recent work in the AHRC's 'Digital Transformations' theme. For example, Leicester was the hosiery, shoe and textile centre of the UK in the nineteenth century, but increasing foreign competition meant that the small workshops and warehouses in the St Georges area of the city closed down from the 1960s. The many striking Victorian buildings in the area encouraged its designation as a cultural quarter, but if such an activity is to be successful, it needs to draw on the memories and meanings associated with the area, and the importance of memory as capital for cultural regeneration in cities like Leicester was illustrated by the work of the AHRC project, Affective Digital Histories: Re-Creating Deindustrialised Spaces from the 1970s to the Present ([affectivedigitalhistories.org.uk](http://affectivedigitalhistories.org.uk)).

Affective Digital Histories used a number of methods to explore the ways in which memory, by adding meaning to the spaces of Leicester's cultural quarter, fosters the regeneration of the area. Writers were commissioned to produce stories drawing on the history of the area which in turn provided the basis for apps, artworks and films. The historic soundscape was documented in a way which will foster cultural tourism. Pop up activities like the New Incunable Shop, in which members of the public could have their designs turned into 3D-printed woodblocks, recreated the old artisan traditions of the area.



The importance of memory and local traditions in negotiating the post-industrial landscape is a prominent feature of a number of AHRC projects supported by the Connected Communities programme and Digital Transformations theme. The creative economy is fuelled as much by engaging with the past and exploring the traditions of an area as it is by innovation. The Pararchive project ([pararchive.com](http://pararchive.com)) sought to explore this intersection between memory and community in such contrasting communities as the potteries town of Stoke-on-Trent and the island of Bute in Scotland. Yet within the stories and shared experiences of people in Stoke or Bute lie lessons that will be valuable in a digital world. The information on ceramic techniques gathered by projects such as Ceramic City Stories, one of the partners in Pararchive, can be vital to makers of the future, while in Bute an enhanced understanding of the landscape aided by digital research might help the island's future economy.

Perhaps the most striking illustration of the way in which new technologies gain unexpected depth and richness from community involvement is the Tangible Memories project at the University of Bristol ([tangible-memories.com](http://tangible-memories.com)). Care of the elderly is a major social concern, and there is a pressing need to find ways of ensuring that this care not only keeps frail people safe and secure but also enriches their life and respects their sense of identity. The connectivity of the internet of things might seem a million miles from such concerns, and indeed it may seem that this is the type of technology which would be alienating to elderly people. But Tangible Memories worked in partnership with care home residents to use internet of things techniques so that a resident in a care home could associate memories with particular objects. A digitally-enabled rocking chair is found soothing and restful by patients with dementia.

This cultural capital of memory does not need to be parochial. A city like Stoke, Bristol or Dundee has for centuries been international in its reach and connections. Local memories are just as likely to refer to Mexico or Buenos Aires as Burslem. The cross-connections between artists who engage with city spaces from countries such as Uruguay, Argentina, Chile and the United States is an explicit theme of the AHRC-funded Cities in Dialogue project ([latamcyber.wordpress.com](http://latamcyber.wordpress.com)). Likewise, another of the activities we are celebrating in the Digital Design Weekend this year is the Digital Futures Lab which looked at cultural exchange between Dundee and Mexico. Our rapidly-deepening connectivity offers all sorts of new opportunities for cultural exchange between such contrasting and distant places as Dundee and Mexico. But these exchanges become even deeper and more meaningful if we use the digital archives and libraries now available to us to give historical and cultural depth to these exchanges.

Thus, we can find that, while there isn't much Mexican food in Dundee, there are deeper historical connections. The British Historical Newspaper Archive (created and run for the British Library by the publishers D. C. Thomson, based in Dundee) reveals that on 19 December 1912 the steamship Mexico which had been built in Dundee set sail for the Panama Canal. Or we can read a news story from 1906 about the experiments of the Dundee merchant George Miller who was attempting to introduce jute growing into Mexico. And of course there are stories of ships travelling between Mexico and Dundee, caught in storms and suffering mishaps, and making us realise that the connections between Mexico and Dundee are closer than we might think.

The memory enshrined in libraries, archives and museums is as much international as it is local. I used to work in a remarkable library at St David's University College in Lampeter, a small and remote market town in west Wales. Lampeter was the first college established in Wales and during the nineteenth century a lot of effort went into building up its library. In particular, a surgeon who had made a fortune in India, Thomas Phillips, sent thousands of books to the new college. Phillips had strong views on education. He believed in the importance of visual knowledge. As someone who had travelled the world, he wanted the students at Lampeter to understand what the outside world looked like. He sent beautifully illustrated books of factories and steam engines, of Russian and Chinese costume, of the architecture of Rome and Athens.

Among the books sent by Phillips to Lampeter were seven huge folio volumes of Lord Kingsborough's lavishly produced *Antiquities of Mexico*, the first volume of which appeared in 1831. Kingsborough's book was a landmark in the study of Mayan culture, and reproduced many Mayan manuscripts, including the first complete facsimile of the Mayan Dresden codex. The volumes of Kingsborough's rare book preserved in Lampeter are among the best surviving copies. Lampeter, as a remote Welsh town, may not seem to have many links with Mexico, but this book, and the remarkable volumes given to Lampeter, by Thomas Phillips, provide a cultural connectivity which reaches way beyond Wales.

As we create open and collaborative digital resources, and link them together, we help realise the value of our shared cultural capital in new ways which will shape the future of our cities, market towns and countryside in unexpected and exciting ways.



## Tangible Memories: Community In Care

### Co-designing digital tools

The Tangible Memories research project has been working to co-design a set of new digital tools to address some of the key societal challenges concerning the care and wellbeing of older people and the legacy of the memories and stories that they leave for future generations.

Bringing together an interdisciplinary team, including digital artists and makers, learning researchers, computer scientists, historians, older people and their carers and families, we are co-designing tangible technologies to enhance democratic community building and to engage residents in care homes in multisensory experiences.

### What have we made?

Our research and co-design work has produced a range of technological prototypes including:

An app that enables residents to work with families and care staff to create their own interactive life history books or group history books. Stories are recorded into the book and played back by simply scanning pages of the book.

An interactive rocking chair that enables residents to listen to audio including sounds of nature, poems and favourite music.

A tactile patchwork cushion which can be programmed to play favourite music or audio stories – personalized for individual residents, using printed images and visual recognition software.

TopoTiles, miniature geographical landscapes that unlock audio field recordings of places and spaces.

A 'pick up to play' music app, that makes listening to a memory filled music playlist as simple as picking up the phone.

The use of Virtual Reality headsets that can transport residents to local landmarks and places they are no longer able to visit.

### Collaboration and Engagement

We have found that harnessing the power of innovative tangible technologies in care settings can impact directly on relationships of care, on intra-generational relationships between residents themselves and on intergenerational relationships between residents and their families and friends.

The 3 care homes in which we have worked (one extra care facility, one dementia care facility and one private care home with mixed residents) have seen the effects of the use of these technologies first hand and all are keen to take on our technologies and develop their use in their settings.

At the end of the current funding each of the settings will be provided with a suite of prototype technologies and key members of care staff, some families and several volunteers will have been trained to use the technologies in the care facilities. These technologies will be housed in a designated space within the care homes.

#### **The Interactive Rocking Chair**

With care staff and residents in a care home for people with more advanced dementia we have developed a rocking chair that plays therapeutic sounds from nature, music and poetry, emitted through speakers in the chair's headrests, and activated by the rocking motion. As the residents gently rock and listen to the dawn chorus, or to crickets singing on a summer's evening, their journeys of the imagination can rekindle past memories and help to assist story sharing.

Residents' reactions to our prototype chair were varied and left lasting impressions on all involved. One resident, a former pilot, spent some time exploring the surface of the chair through touch, commenting that it reminded her of the cockpit of an aeroplane. Then, listening carefully to the different sounds emitting from the speakers embedded in the rocking chair's headrests, she identified a woodpecker and an owl's call among the chorus of birdsong, and she even cooed back to the owl in reply. As she heard the rhythmic sound of someone walking on snow, she lifted her legs up and down in time, keeping apace with them, and describing a vivid story to us about what was happening in her imagination: 'The farmer's on his way'. Another resident, who usually doesn't speak or sing, sat in the chair and sang 'Rock a Bye baby' from beginning to end, causing an emotional response from the care staff present.

#### **The Story Creator App** *(Available on iTunes)*

Books provide a tangible, familiar interface for storytelling and reminiscence. We have co-designed an app with older people and care staff that can enable them to easily produce books based on their stories. You can create pages that combine a photo, text and an audio recording. These can be viewed within the app or printed out. When printed, the audio recording is represented by a beautiful shell illustration. The scan function within the app recognizes the shell on each printed page and, as if by magic, plays back your audio.

Rather than making a book about his life and memories, one gentleman we worked with created a book about the extra care facility where he lives. With so many terrible stories of cruelty and neglect in care homes he wanted to document and celebrate the place where he lives.

In the interactive book he talks about his impressions of how the care of older people has changed over the decades. He wanted to include other voices in the book – showcasing the creativity and life histories of other residents, featuring poetry, short stories and accounts from the rich lives they live now and have lived in the past.

#### **Where next? Continued collaboration and engagement**

Our partners in care homes and extra care facilities have told us that they would be keen to create an engaging space in their setting where older people and others can interact with disparate objects, sparking questions and new interests encouraging them to use our technologies together to record and share their ideas, memories and stories. We have worked with them to imagine and design a new space of discovery, connection, meaning making and mystery, filled with objects – rather like the 'cabinets of curiosity' or 'wonder rooms' of old. Care managers believe there is huge potential to use these Parlours of Wonder as 'community hubs' where children from local schools, community groups and isolated older people living in the community might be encouraged to come and enjoy a cup of tea and a chat or a more formal encounter, sparking questions, connections, new interests or opportunities for retreat and contemplation.

Unlike cabinets of curiosity our 'Parlours of Wonder' will not be designed and curated by us as historians, learning researchers and artists. Rather we want to disrupt power differentials in regard to who is permitted to order knowledge, rank and classify objects and stories. Our vision is that these spaces will be co-curated by and for residents, care staff, families and community members. We are currently exploring funding routes to support our continued work on these ideas and to develop our prototypes to be of use more widely.

#### **Project team:**

*University of Bristol: Dr Pete Bennett, Dr Kirsten Cater, Professor Tim Cole, Dr Seana Kozar, Dr Helen Manchester*

*Designers: Stand + Stare Collective, Heidi Hinder*

*Collaborators: Alive! Activities, residents and staff at The Orchards (St Monica's Trust), Blaise Weston Court (Hanover extra care estate), Stokeleigh Lodge*



## Tell A Story On YARN

The Pararchive project, based at the School of Media and Communication at the University of Leeds, worked with a diverse range of communities to design and build a digital platform that would allow them to tell stories, present their own histories, do research and work collaboratively. We aimed to co-design and build a range of digital resources that could enable communities to become expert in telling of their own stories, in communicating their own histories, and sharing knowledge. We also wanted them to be able to draw on a broad range of archival and cultural materials to facilitate this work.

Our groups were comprised of archaeologists and local historians from the Isle of Bute in Scotland, Filmmakers and Arduino programmers from Manchester, and industrial historians, ceramics collectors and ecologists from Stoke-on-Trent. They worked in partnership with academics from Leeds and York University, technology developers from Carbon Imagineering and curators, archivists and technology developers from the Science Museum Group and the BBC to create a new digital resource.

Communities and cultural organisations experience many obstacles in using online heritage resources and developing collaborative relationships. Issues of access, copyright and the restrictions often placed on usage are compounded by existing problems of web usability and the dispersed nature of existing resources and platforms. We want to encourage the direct use of digital archives in creative work and historical research, while at the same time breaking down the barriers between institutional collections and the publics they serve.

Using co-design methods, in conjunction with innovative storytelling workshops and creative technology labs, we explored the ways in which our community partners told stories, researched, and engaged creatively. We began through analogue processes, using post-it notes and archival materials to model potential digital resources, and our team from Carbon Imagineering ran design and storytelling workshops in the communities to co-develop a specification and run a series of exercises in which our communities developed their own research agendas and creative projects. Each community ran a series of projects that were then used to develop and test the resource we were creating and through which they would eventually be published. Over the course of the eighteen-month project we created a series of tools that were designed to be intuitive and flexible, aiding users to develop projects that incorporated online materials and allowing them to add their own materials in the form of photographs, films, text and sound recordings. We wanted to orchestrate existing web functions and innovate new tools that would allow people to work on a single site and draw together disparate and unconnected bodies of content. We also wanted to create a space in which every member could create and curate their own collections of materials, and where institutions like galleries and museums could post collections for public use.

Once the communities had determined what they wanted to explore we then engaged a range of institutional partners, most notably the Science Museum Group and BBC Archives, to begin to provide content and materials to form the basis of these projects and allowed these institutions to explore their own relationships with communities and consider ways in which their content could be published and enhanced through crowdsourcing and public expertise.

The project resulted in the creation of the new storytelling tool YARN that has just been launched and offers a series of insights into co-creation approaches, the role of institutional voice, concepts of democratisation of institutional culture, and the changing conceptualisation of the audience, creative interventions and the role of the digital public space. YARN is a resource that can be used by citizens, communities, organisations and researchers and now we want everyone to help populate and develop our community.

Our resource is open, cost free and relies on hot links to allow for flexibility and avoid frustrating IP issues. It also means that people retain control of their own content and can enrich and give meaning to material, both private and public, that is featured here.

Learn how to start a story here: <http://beta.pararchive.com/stories/120>



## The Latin(o) American Digital Art Project

The Latin(o) American Digital Art Project from the University of Liverpool explores how artists from Latin America, and those of Latina/o origin in the US, interrogate national and regional identity through the representation of iconic locales in their online art works. The project has focussed on the transformations that digital technologies have on conventional artistic practice, and has looked at how artists create new, hybrid genres as they work with digital technology.

The project has looked at several key issues when dealing with the exhibition and curation of this type of art. Firstly, the various artworks, interventions and events that were organized by the project each relate to the cityspace, and invite the audience to re-think the urban space that surrounds them. The artworks aim to explore how virtual space and physical space can dialogue with each other in the city. This then gives rise to some concerns: firstly, how can digital art – often containing components that exist in virtual space – be exhibited in physical space? Secondly, given that the artworks chosen were originally developed in a specific city space, a fundamental challenge was how to translate that to another city. When taken out of their immediate environment, how do place-based digital artworks function?

The project concluded that, as regards exhibition spaces for new media arts, the venues selected needed to be flexible, and able to accommodate both the digital and the place-based elements of the art works. The exhibiting of the works in a physical place meant that audience interaction could take multiple forms, including the tactile as well as the virtual. Also, adapting the artworks and the associated events to the local circumstances of the space led to creative dialogues with the artists, and a richer understanding of the artworks.

Secondly, the project looked at how to bridge the gap between social media and cultural-artistic practice. Social media use is ever more prevalent in our current times, with an estimated over 2 billion users worldwide. But social media is often used to communicate fleeting thoughts, or mundane comments about everyday activities. How might we capitalize on the current boom in social media to, instead, encourage audiences to engage with artworks? How can critical thinking and artistic engagement be mobilized via social media? And how might we conceive of social media as a way to develop feedback loops with artworks, and to help the artworks reach out beyond the gallery space?

Here, the project developed Twitter curation activities, focussed around two months of Twitter galleries, and found that this enabled an engagement that was less cumbersome than the traditional 'exit survey', and was also a way of making the artwork more dynamic. Challenges included being able to develop a narrative through the limited character lengths of Twitter, and of effecting real changes in behaviour when people use Twitter – more on which can be seen in our Policy Document.

Thirdly, the project looked at how to ensure the representation of Latin American and Latina/o American artists within the digital art scene. Often, discourse about new media technologies is predominantly Anglophone: it's frequently the latest technologies developed in the US that grab the headlines, and much of what is written about technology tends to be focussed on English-language works. All too readily, when we think of 'technological innovation', we implicitly assume a broadly US model as the norm. But what about the vast community of non-Anglophone artists working with digital technologies? Major developments in digital practice, such as the resistant use of low-tech, or tactical media, have their roots in, or have been elaborated by, Latin(a/o) Americans. These approaches have had major impacts on digital artistic practice, and can make significant contributions to our understandings of how digital technologies and art can come together.

Hence the project attempted to raise the profile of Latin American digital artists, bring their work to a UK audience, and provide for innovative forms of engagement with their practice. This involved close collaboration with, and support from, the curators at FACT, Liverpool, and at the Independents Liverpool Biennial. There were significant benefits, including an enrichment of the current offering, and the bringing into dialogue of different practices. There were also challenges, including linguistic and cultural ones, which are discussed at more length in our Policy Document.

#### At the Digital Design Weekend

At the Digital Design Weekend, The Latin(o) American Digital Art Project presents *This Too Shall Pass// Affective Cartographies*, the multimedia art work developed by their Artist in Residence, Brian Mackern, during his residency in Liverpool in 2014. *This Too Shall Pass* was developed during the Cities in Dialogue series of interventions, which brought together leading digital artists from across Latin America who each engage with cityscapes. The intervention includes a showing of the artwork *This Too Shall Pass* across multiple screens, with sound and interactive features for audience intervention. For this artwork, Brian reworked the footage obtained through his *dérives* (a series of unplanned journeys along an urbanscape) in Liverpool. That gathering of information and recording of sound and visual material is then remixed in this artwork by different parameters (volume levels, transparencies, zooms, fragmentations, crossfades, speeds of timelines, etc.) controlled by Liverpool's 'socio economic historic curve' of the last century.

In this piece, Brian Mackern addresses the representation of places and different aspects of the localization of 'being'. He also engages with the port city: ports are waypoints on a trip, ingesting and refashioning cultures, rebuilding urban traces and histories. Ports construct societies and are ways of reinserting new and old meanings into our ways of seeing and being in the world; they provide opportunities for an outsider stuck inside another culture to question his being in this world. They are, in other words, interfaces.

As well as the digital artwork itself, printed postcards are also provided as part of the installation, and form a way of continuing the dialogues across the cities. The public is encouraged to take away one of the postcards and send it to another city, or to post it into our low-tech postbox to provide feedback on the project and communicate with the artist.

There is also the opportunity to vote for images, and share your own images of your own city, using Twitter, through the project's Twitter galleries. There will be the opportunity to share in the debate on Twitter curation. Finally, the project will also be sharing their Policy Document, which arises from the findings of the project.

## Marginalia Machine

The Marginalia Machine is a drawing robot – a Cartesian plotter – that reproduces editorial notes from manuscripts in the archive of Bloodaxe Books. Taking a scanned poetry manuscript, custom-made computer vision software differentiates the text of the poem itself and the handwritten notes around it. The main text is discarded and the notes are sent to the machine where they are drawn, with a pen, on a continuous scroll of paper. Over the course of an exhibition a number of scrolls are produced combining the notes of many manuscripts in a series of enigmatic snatches of text and looping abstract marks.

The Marginalia Machine was produced as part of a Research Through Design process within a larger, funded research project, 'The Poetics of the Archive, Creative and Community Engagement with the Bloodaxe Books Archive' based in the department of English Language and Linguistics at Newcastle University, UK. Bloodaxe Books is a small but internationally significant publisher of contemporary poetry, whose archive, consisting mostly of edited manuscripts, was purchased by Newcastle University in 2013. Our role within this research project – as artists and interaction designers based in Culture Lab an interdisciplinary research centre focused on digital culture – was to create exploratory and provocative interactions with the archive both online and in physical space and the Marginalia Machine was part of a larger ecosystem of works of creative art and interaction design.

With the machine itself as with other things we made, we aimed to be responsive not only to the aspirations of the various project stakeholders (Bloodaxe Books themselves, our colleagues in English and in the library Special Collections department as well as the community of poets, scholars and other parties interested in the archive) but also to the materiality of the archive itself. We conceived of this materiality as consisting not only of the manuscripts and records themselves but also in a broader sense as being embodied in the technical infrastructure, working practices and physical spaces of the university. The Marginalia Machine explores the archive materials themselves but in the context of their transition from an uncatalogued archive to one that is formally described, searchable and publically available. Not only was the archive being formally catalogued throughout the design process but some of the materials were being digitized, a process which profoundly alters the way we see such material and the way that it is used.

As such we saw this period as a particular kind of opportunity within the life of the archive to experiment with its presentation to the public in the course of learning about it ourselves. Archives are often held to be seats of a particular kind of knowledge and with that knowledge comes a kind of power to produce a partial description of the past.

By varying and pluralizing the description and presentation of the archive with the Marginalia Machine and with other creative work we hoped to open this description to interpretation and to at least feather the edges of some of that power to present the past.

Research Through Design uses the unexpected consequences of building and using physical things to find things out. The Marginalia Machine – although presented as an artwork – was part of a design process that allowed us to think about the archive and its new home in the university and helped us to design later interfaces to it. One particular thing we came to consider was the way that we had thought of the archive as a static entity that we were simply describing in different ways. The demands of the production process of the Marginalia Machine caused us to engage with our colleagues in the library and learn about what they did. Being unused to the actual practices of cataloguing and digitization our prejudice was to conceive of them as something which stood effectively apart from the materials themselves, as something that lay 'on top' so-to-speak. On the one hand there would be the materials themselves and on the other a set of meta-data, image files of digitized material and interfaces on the web written in code. These things we assumed would be formally separate. Of course in practice this is radically untrue. Cataloguing physically disturbs the material in a number of significant ways. Some items are literally discarded. Duplicates and enclosing materials such as envelopes are trashed, materials are re-packaged and re-arranged sitting in new groups suggesting new correspondences. Items are marked in pencil with their newly assigned identity numbers. They are clipped with brass paper clips and bound with unbleached cloth. These actions are performed in order to preserve the archive, to arrange it according to a vision of use and to render it tractable for study but there is also a kind of violence at work, a tough love as heterogeneous materials are made homeogenous, filtered, sorted, marked and boxed. Most of all there is a web of professional activity and technological/material transformation around the manuscripts that caused us to conceive of the archive as 'live'. Liveness as we conceived it brought about a view of the archive as a dynamic, processual entity open to active reconfiguration.

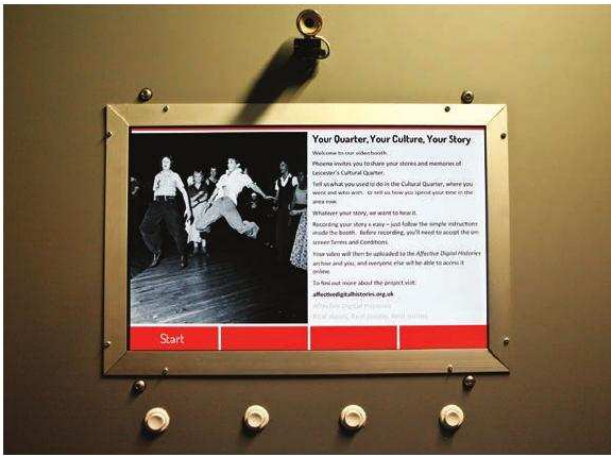
With the Marginalia Machine we were particularly interested in aspects of the archive itself that were not represented in the formal catalogue. The margin notes may be referred to in the catalogue description but typically would not be except in cases where they are particularly significant in the definition of an item. Even then the description is terse and formal. We consequently saw an opportunity to foreground this rich facet of the materials at exactly the point (i.e. during cataloguing) where it eludes description. In this sense we were attempting to refer to aspects of the process of archiving at a professional, material and technical level.

The software behind the marginalia machine takes newly created digitized images and decomposes them into background, typewritten and handwritten/hand drawn parts. At the point where an item was formally ingested into the system our software intervened and effectively 'forked' its development into a new, unexpected strand. This sense of timeliness also led to a related design intervention within our project. @BloodaxeArchive is a Twitter bot, an automated agent that tweets marginalia images from the archive as soon as they are digitized alongside a link to the catalogue entry describing the original item. Taking advantage of our own position within the university's internal network we were able – with the agreement of our colleagues in the library – to programmatically watch the technical systems with which the manuscripts were digitized and mark the appearance of each new item, in an indexical fashion, with a public manifestation. The timeline of @BloodaxeArchive actually reads as an alternative history of the archive's archiving, one uttered by a hacking of the technical infrastructure of the archiving process. Scrolling through this history it is possible to observe batches of works from a particular author, sets of cover pages even to get a sense of how much digitization was being done and when. In the Marginalia Machine too some images stand alone with legible notes describing no-longer-present text in a kind of poetic elision. Others form new correspondences as formal similarities emerge between the (now) abstract shapes of crossings-out, parentheses and typographical annotations. These sequences tell a story of archiving in enigmatic visual language quite apart from their catalogue descriptions.

The Marginalia Machine and @BloodaxeArchive were also attempts to engage publics with the emergence of the archive and the interfaces to it. With them we hoped to engage both expected audiences (@BloodaxeArchive has around one hundred followers who are almost exclusively poets, literary scholars, archivists and librarians) and – with the public exhibition of the Marginalia Machine in venues like the V&A – to attract new ones to the fascinating material painstakingly catalogued by the Special Collections department at Newcastle University. The exploratory and experimental nature of the Marginalia Machine also inflected the interface that we built to the archive. In a direct reference back to these designs, marginalia-only versions of scanned images are available for many items but more generally our various off-kilter 'lenses' on the collection reflect our interest in pluralizing and loosening the ways that the items are described. 'Shapes' for instance allows users to sketch the form of a poem with the mouse and explore poems with a similar outline. 'Words' uses text-mining techniques to explore network-like correspondences between manuscripts.

Our aim with these designs was to take a step outside of conventional ways of seeing, describing and searching archival materials and by doing so to think about the potential of digital culture heritage, not only as a source of new knowledge but as a site of creative potential. We hope that you will explore the archive and make something new.





## Recreating De-Industrialised Places, 1970s – Present

Affective Digital Histories: Recreating De-Industrialised Places, 1970s – Present was a research project led by the University of Leicester that set out to explore the untold stories of people who lived and worked in former industrial buildings at two locations: Leicester's Cultural Quarter and Glossop, a mill town in North Derbyshire.

The decline of British manufacturing during the 20th Century has been well documented. Many of the buildings and spaces that were built for industry still exist today, converted to museums, galleries, cafes and apartments, with varying degrees of connection to their original purpose. Much of this has come about in the past two decades through a process of commercial and government driven regeneration.

What's less well documented is the role these places played in the lives of communities and individuals before the regeneration boom of the 2000s kicked in. How were de-industrialised spaces reoccupied and reused? How did this change over time? And what effect did this have on the people who used them? It's this social heritage that Affective Digital Histories was chiefly concerned with.

A really broad partnership of different individuals and organisations came together to try and find answers to these questions: academics and researchers worked alongside artists, curators and technologists – developing new approaches to engaging the public in this research using art, culture and new technologies.

In Leicester, what's now the city's Cultural Quarter was once home to a thriving hosiery industry, and whilst remnants of this industry remain in the area to this day, it had mostly succumbed to a long process of decline by the late 1970s. During the 1980s the area became home to the city's underground music scene, with Northern Soul all-nighters, Hip Hop clubs and organisations like the United Caribbean Association moving in.

During the 90s rave culture took over, with one of the country's biggest clubs – the Dielectric – opening in the area. However over time the district had fallen into disrepair and by the early 2000s many of the buildings were vacant or rarely used. In the early 2000s, the City Council chose the area to be the city's new Cultural Quarter, with a theatre, cinema, galleries and dozens of creative businesses moving in over the past decade.

Many of the people who were involved in the area during the 80s and 90s are still in Leicester, and reconnecting with these people was one of the highlights of the project. Hearing and recording their stories and reminiscences helped shape all aspects of the work, whilst at the same time bolstering the University's already extensive archive of the area.

The digital elements of Affective Digital Histories were vital, giving people new ways to engage with the history and heritage of the area. Working with new technologies not only gave us alternative ways of allowing the public to access our work, but also shaped the creative and artistic projects that emerged out of the research.

For example, the Hidden Stories Smartphone app presented a new way of accessing creative writing inspired by the area, connecting stories with the locations and histories they explored and unlocking content as the user moved between the streets and buildings.

And another app, Sounds of the Cultural Quarter – created a unique aural experience, immersing users in sounds from past and present, heard individually or as a multi-layered soundscape. Specially recorded sounds – from birdsong to industrial machinery – were activated as users explored the area, reinterpreting the urban history of the Cultural Quarter and bringing it to life in a vivid and fascinating way.

Other elements of the project echoed the rise, decline and re-emergence of small industries in the area and pointed towards ways of creating new archives for the future. For instance, artist duo Juneau Projects created The New Incunable Print Shop, an exhibition and working print shop – inspired by printmakers from the city's hosiery industry – that invited members of the public to make their own printing stamps, 3D printed in wood, and design and create posters for events submitted via Twitter and Facebook.

Our hope is that these projects, most of which are ongoing, will leave an important legacy for anyone interested in understanding how individuals and communities occupied formerly industrial spaces, giving an insight into the economically and culturally 'big' questions of how communities can shape the environments they inhabit.

*Affective Digital Histories was based at the University of Leicester and involved researchers from the departments of Management, Urban History, Geography, Museum Studies and Digital Humanities, as well as metadata specialists from the University Library. The Centre for New Writing based at the University's School of English commissioned the creative writing for Hidden Stories.*

*Phoenix Cinema and Art Centre was the arts partner, and Cuttlefish Multimedia was the technology partner of the project.*

*Other partners included De Montfort University and the East Midlands Oral History Archive. Affective Digital Histories was funded by the Arts and Humanities Research Council.*



## Met Office Informatics Lab

2015 will be my third year at the V&A Digital Design Weekend; these events have had a remarkable impact on how my colleagues and I think about our work, and our way of working. This year I'll be participating as part of the newly formed Met Office Informatics Team, a group born of a commitment to experiment publicly with the use of new technology and design. Back in 2011 when I introduced the Met Office to hackathons our events were quite private affairs, in September 2013 that suddenly changed. Being invited to work in a major museum, meant I needed to find creative collaborators who were enthused by the idea of making in public. With no real track record, and only a vague notion of what we might achieve, it required brave makers. Exeter College came to the rescue and dazzled us all. For the Climate Change and Fashion Hackathon in 2013 we set ourselves the challenge of breaking free from the typical constraints of a hackathon and making wearable items in two days. Gently directed by their tutors Michelle Moinzadeh, Julie Saunders and Rupert Johnstone, the Exeter College students embraced the challenges and got on with making stuff. This experience has affected how all of us think about our own learning. I'll let Michelle Moinzadeh explain:

My students are intelligent, creative but above all skilful and they love to make. They don't just want to make a dress or a pair of trousers, and our conversation normally starts with, 'Michelle, I have an idea for my outcome, I want to MAKE .....

When Michael asked me, my students and my colleague Rupert Johnstone to join them in a 'hackathon' at the V&A three years ago, we jumped at the opportunity not really knowing what a 'hackathon' was. Michael tried desperately to explain how this might work and then simply said 'we just go to the London Design Festival and MAKE STUFF and have fun, with lots of other people who want to make stuff'. My students at that point jumped at the opportunity to 'Make Stuff' and the prospect of working with scientists, coders, fashion designers, product designers and other makers was just all they could talk about.

Back at Exeter College, full of enthusiasm for the idea and its potential, we tried to explain the concept of the 'Hackathon' and the benefits of the process to our colleagues and managers. Whilst sensing our excitement, they also sensed the inevitable 'looseness' of an open-ended process such as this and reminded us of the necessity of keeping the focus on teaching and learning.

Rupert and I then had to think about how we were going to build this new way of collaborative thinking and teaching into our everyday working practice and curriculum. How do you get young learners to feel confident about openly sharing ideas in the classroom and at a prestigious event such as the London Design Festival with existing designers, highly inventive scientists and makers?

This was easier than we realised; our students unlike ourselves, and any generation before, have grown up within an ever changing digital world, where new ideas and technology are openly shared every minute of the day. The idea of sharing information and the respect that they all have for sharing ideas and information is inspiring. As young individuals they are interested in their world and are well informed about issues which are relevant now and in their futures. They respect one another's viewpoints and are always supportive of each other's ideas and thoughts.

The importance of 'hack' events is that they give learners of all ages and abilities the opportunity to work collaboratively, exploring and inventing ideas to produce a solution without the fear of failing an assessment or an exam. Working collaboratively with a diverse group of individuals often means experimenting with each other's ideas and skills, learning from each other, and often pushing the boundaries of what, for them, they would have imagined possible. The process of making an outcome or resolving a challenge collaboratively teaches them more about the processes of how to think creatively. The chance to work with specialists in other disciplines helps our students to see the problem from other viewpoints, using methodologies possibly unfamiliar to their own and widening their knowledge and understanding of differing approaches. Furthermore, they can see how their own skills in making and thinking creatively are valued by respected professionals in a number of different fields, an important affirmation of the validity of their chosen career path.

That thinking process can be brought back into the classroom and used in all their learning activities. Students who have participated in 'hacks' or 'challenges' often get so absorbed in their activity that they forget about time and learning becomes fun and real. Many of our students progress onto higher education and are able to take these valuable skills with them and become lifelong learners. For every learner this has been one of the highlights of their learning experience at Exeter.

The #FashionClimate hackathon at the Digital Design Weekend at the V&A in 2013 was our entrée into this new world. Our learners had the opportunity to work with fashion designer Professor Helen Storey on her Climate Dress project. The aim was to raise awareness of climate change and its implications for the fashion industry and what it can do to lessen the impact of its activities on the global climate. The project is still ongoing and we continue to work on these ideas with our students.

Seeing how much we enjoyed the V&A hack, Michael suggested another event that we might like to take part in. The International Space Apps Challenge, organised by NASA, takes place over a weekend in sixty five countries with over eight thousand participants, a truly global collaboration.

So in April 2014, Exeter College students, collaborating with Jon Spooner of UNSA and Professor Jon Rogers of Dundee University, designed and prototyped internet connected clothing for astronauts on the International Space Station. To the delight of our students this project won one of the five global awards.

Following this, we saw an opportunity to take the excitement of hackathons and the Digital Design Weekend into a new event in Exeter. There is a wide pool of amazing skills and talent in science, technology and the arts in the South West. Our aim in organising 'Connected Exeter' is to try to bring some of this talent together with some of the amazing things we had seen in London. Added to this, to include students of all specialisms and levels as well as the public for a weekend of collaboration, learning and fun. The first festival in 2014 was organised in partnership with Exeter College, the Met Office, the Royal Albert Memorial Museum, The Phoenix Arts Centre and the Fab Lab at Exeter Central Library, with help and support from Irini Papadimitriou of the V&A.

Our aim is to introduce this amazing learning experience to a wider range of students across Exeter College and beyond. The London Digital Festival enables us to showcase our work and to continue to integrate the opportunities afforded by the collaborations that this partnership with the Met Office has enabled. We want to expand and embed this creative process further within our curriculum and other teaching institutions so more young individuals can continue being involved in collaborations and digital making. It offers exciting opportunities to make the process of learning more relevant to the working world that our students will enter and makes what has already been taught in the classroom more valid and real as it is 'discovered' and thus aids the development of learning skills. Lastly and most importantly, because it is fun of course!

*Met Office Informatics Lab: Michael Saunby*

*Exeter College: Michelle Moinzadeh, Rupert Johnstone and Thomas Duggan*

## #fixingattitudes

Fixperts is an active and growing creative social platform that encourages people who are good at making to fix for others and share their stories online. Founded in 2012 by designers Daniel Charny, James Carrigan and a group of like-minded volunteers, it is now happening in universities and schools as well as within commercial companies in over 15 countries.

Fixing is not in any way new and is still often the most immediate and efficient thing to do when things stop working. However, a growing part of urban populations are becoming estranged from the knowledge of repair, which leaves them with the limited options of either replacing or ignoring. Is it because we are wired to desire the new? And are we past the point where abilities to make and think like makers will shape our future? Can we afford to lose humanity's most precious resource or should we find a way to fix this?

Collaborating with designer Koby Barhad, Charny edited a comics titled Brave Fixed World. The excerpts included here are staged in three chapters, from reflecting on attitudes to calling for a more resilient, conscientious, generous and creative future.

### *Chapter 1: Only New*

*There is no need to know how to make or fix things. Endless resources mean new is the only way forward. New is the new black. Use once. Worship disposability. Throw away culture. Keeping is for losers. Only new and new alone can make this world seem right.*

### *Chapter 2: Wake Up*

*No one knows how to make or fix things. Scarce resources mean resilience is the only way forward. Humanity wakes up to its most precious resource: imaginative use of skills. A new type of making is the only way backwards, sideways and forward.*

### *Chapter 3: Where do we start?*

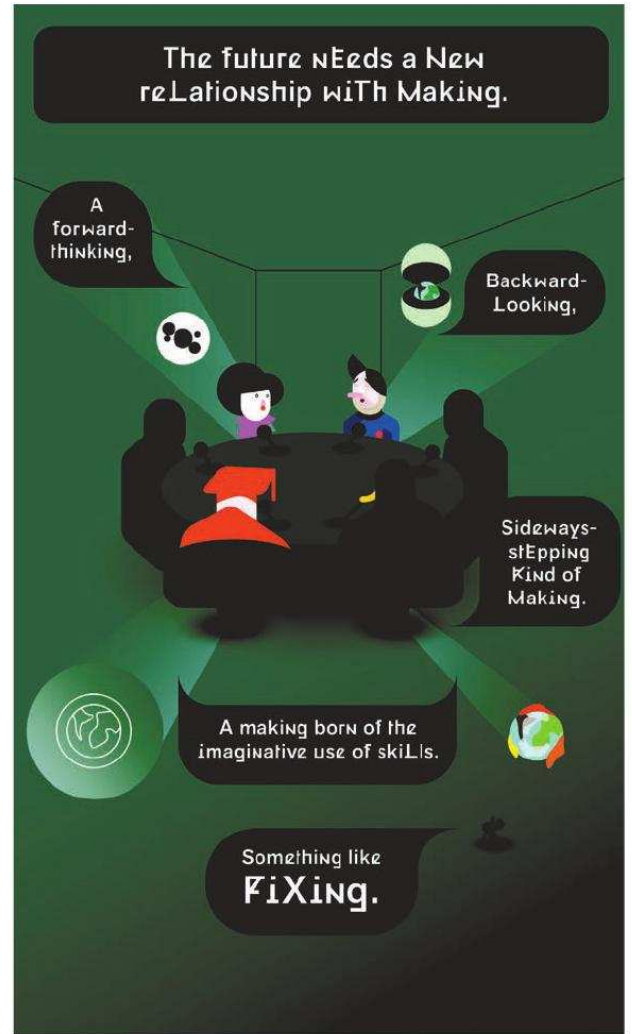
*Making and thinking. Examples and principles. Actions and words. Whether it's about fixing things or processes, materials or systems, society or economics... we need to start with #fixingattitudes.*

# ONLY NEW

		
<i>Only NEW Can make this world seem right.</i>	<i>Only NEW, can make the darkness bright.</i>	<i>Only NEW and NEW alone Can thrill me like NEW do And fill my heart with love For only NEW.</i>
		
<i>Only NEW Can make this change in me, For it's true, NEW is my destiny.</i>	<i>When NEW olds are banned, I understand the magic that NEW do.</i>	<i>You're my dream come true, My one and only NEW.</i>
		
<i>Only NEW Can make oh, this change in me, for it's true, NEW is my destiny.</i>	<i>When NEW olds are banned, I understand the magic that NEW do.</i>	<i>You're my dream come true, My one and only NEW.</i>

Chapter 1

The future needs a New relationship with Making.



A forward-thinking,

Backward-Looking,

Sideways-stepping Kind of Making.

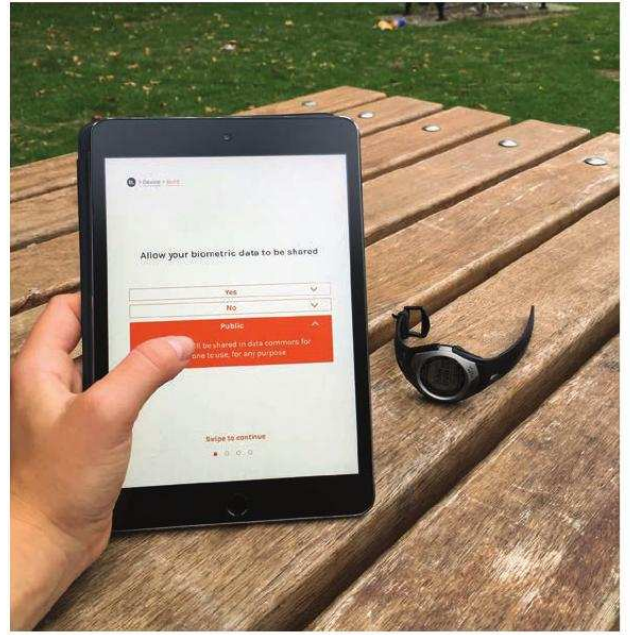
A making born of the imaginative use of skills.

Something like **Fixing.**

Chapter 2



Chapter 3



## New Civic

**'Beneath the paving stones, the cloud'** (*James Bridle, 2015*)

Each time we use a connected product or service we generate a tsunami of personal data. It is difficult to grasp the scale of our data output because it is so vast; it's something like each of us posting 27 million Tweets every day. Companies aggressively collect our data, because it fuels their businesses. They make huge profits from processing our information and often selling it to advertisers. The problem is that we have no control of our data: we have no say in who can collect it, what they can do with it or where they store it. We are all in a position now where we each have huge quantities of data fragmented across the internet, stored in centralised silos out of our reach.

As our digital culture rapidly propels us closer to the impending Internet of Things, where the internet will be embedded in all things around us, the quantity and detail of the information collected about us is about to dramatically increase. In fact, in this Internet of Things scenario, more information will be produced each day than has ever been created. The incumbent internet giants are likely to remain the main technology providers because they continue to invest in new opportunities for their products and services. This means these companies will continue to dominate our lives and our futures. As Margrethe Vestager acknowledged recently: we live in the Google age.

But there is a problem, because many of these platforms and tools are not just commodities, as they are challenging and fundamentally changing our civic frameworks: our privacy, our culture, our laws and our finance. In many ways, digital services like Google, Uber and AirBnb are the infrastructures of the 21st century. The question is who controls these technologies? Who writes the code and who owns the data? To whom are these technologies accountable?

In the 20th century our infrastructures and utilities were railways, roads and electricity – platforms built for the common good and designed to support innovation through open design standards. Now our infrastructures and utilities are Uber, Twitter, Google – owned by private companies that operate within a very narrow venture capital investment model. The products and services they support have very little to do with citizens, and everything to do with their business interests. There is growing concern that these digital infrastructures will fail if they continue to be developed as centralised, unequal and undemocratic utilities. The uncomfortable truth is that we cannot continue to build public resources dominated by private interests.

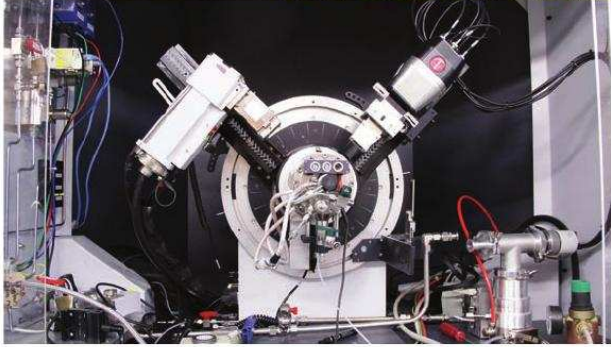
**There is another way**

Decentralised technologies offer a convincing alternative to the mainstream. Decentralisation can appear in many different forms: from mesh networks for community powered WiFi, to blockchain technology that provides trust without the need of intermediaries, to hardware that promises the provision of off grid power. Each of these technologies provide the technical possibility of redistributing the governance, ownership and economics that sit behind a technology from one central authority to, where appropriate, everyone. Decentralisation could bring about a more democratic future where our utilities and infrastructures are built for common good. We could own our data, and be in control of its use and storage. We could redesign our citizenship, embedding our rights within the code of the technologies themselves. It's an exciting prospect.

Decentralisation is, by its nature, disruptive. But for decentralisation to make positive social impact, we must consider and design the civic frameworks that sit behind the technology. Because design and technology, however they are structured, will always influence new politics. We need to optimise decentralised technologies for people, to make products and services that are capable of supporting us not just as consumers, but citizens too. We must consider and test different models for control, ownership and accountability of our technologies.

Since my industrial design masters project – the Alternet, a proposal for a fair trade Internet, completed in 2014 – I have been exploring ideas for how we might produce digital products and services that are designed for the common good. I am interested in developing, testing and building digital tools for a more democratic future. Data Licences, exhibited at the V&A's Digital Design Weekend, is a prototype for one such digital tool. It demonstrates the feasibility of open standards for data – federated data licences, nested in code, powered by a blockchain.

Data licences are essentially a new form of terms and conditions that flip the data paradigm so we own our data. Each data licence (biometric, financial, location...) is customised by the individual, so they can decide whether to share their data or not, who they share with and how their data can be used. The licences are customised by answering straightforward questions on a digital interface. Each licence is interoperable between humans and machines, as licences are made of human, machine and legal readable layers. So once the licence has been confirmed, it can be automatically stored on the blockchain – a marketplace for personal data, where the new data trade can take place transparently. Data licences are intended to empower individuals not just as data producers, but as citizens with rights and powers. With the Internet of Things, smart homes and our ever increasing array of connected devices, who owns the data is becoming a question we cannot ignore any longer.



## The Instruments Of The Afterlife

'Close a pit, kill a community'. This slogan, adopted by Welsh miners during the struggles against the mine closures in the 1980s, marks the significance between land, industry and community. Welsh miners, like their counterparts across the UK, knew the importance of the land as the life-blood of the mining community. This close-knit community prospered during the industrial revolution, but as energy preferences changed, the pits closed and its community slowly disbanded. What remains in the traces of heavy metals in the soil, is a shadow of the people and a disappearing way of life.

Today we face the consequences of the fossil fuels that powered the industrial revolution – from environmental change, to an exploding global population with a hunger for materials to build the new world. Technological progress ushers in the next revolution that will build new relationships with our environment through synthetic biology, plant science and nanotechnology.

In response, an art piece presents a future where the cleaning of polluted land is shaped by an alternative set of beliefs that could mould the new technological revolution. A set of instruments have been created to promote a system of mutual relationships between humans, plants, bacteria and fungi. The system recovers valuable nanometals from the contaminated soil. Instead of using fossil fuels (the remains of life forms from the distant past), technology now uses the contamination left behind by the miners and more recent communities. The musical vibrations produced by the instruments celebrate the past communities' contribution to the present whilst creating physical material from their lives to build the future. This functionality of the instruments moves humans towards a web of relationships between many living components, similar to those found in the biosphere. Together, we enter a future vision where our energy needs and planetary consumption are balanced, and self-sustaining systems have little impact.

The art piece is based on the scientific research, 'Cleaning Land for Wealth', funded by the UK's Engineering and Physical Sciences Research Council. This innovative research project involves a number of leading British Universities. The scientists explain their work:

'The scientific research uses bacteria to produce nanoparticles from plants, which can be used to collect contaminants. The idea is to bring back to life areas of land lost through centuries of mis-use, making land decontamination financially viable, and providing our manufacturing industries with new material, without the need for mining or smelting. But just how much wealth really is beneath our feet? In short, it is very significant. Globally, substantial land contamination exists and blights the lives of millions, but it is poorly quantified, particularly within poor and developing nations where there is limited financial motivation for this to be addressed.



We do know that there are nearly three million 'polluting activities' and 350,000 sites affected by soil contamination that could cost €350bn to treat in the European Union...Almost two-thirds of the contaminated land in England and Wales contains metals (...and metalloids) – with arsenic and nickel accounting for about 40% of this. We have chosen to shine a light on our research through the lens of artists Burton-Nitta with help from the Creative Outreach Resource Efficiency team.'

*Artists: Michael Burton & Michiko Nitta*

*Composer: Neil Luck*

*Musician: Lawrence Tatnall*

*Scientific team leaders:*

*Cleaning Land for Wealth (CL4W): Dr Kerry Kirwan, University of Warwick*

*CL4W Outreach: Dr Louise Horsfall, University of Edinburgh*

*Creative Outreach For Resource Efficiency: Professor Jacqui Glass, Loughborough University*

*www.core-community.net*

*More info: www.burtonnitta.co.uk*



## An Example Of Soft Digital Fabrication

With the rapid development of digital fabrication technologies, 3D printers are gradually turning into a commodity that every creative studio have at hand. In 2010, Kurman and Lipson wrote about the phenomena of a factory at home and one-person industries, which is not only a vision or a prediction but already a reality. At the same time, DIY spaces such as fablabs and makerspaces are focusing on the production of hard-surface objects, while the first digital fabrication tool, the electronic knitting machine, which dates back to 1976, has been forgotten and discontinued. Furthermore, factories and home is what we already saw in 19th century when the first knitting machines were invented and women were enabled to work from home. In our opinion, this kind of home knitting factory continues to exist and allows women, especially in Eastern Europe, to earn some income. Unfortunately, all these knitters are working with outdated knitting machines from 1980s, using punched cards and floppy disks to upload patterns to their machines.

Within this context, we saw the need for a contemporary knitting machine, which follows the principles of digital fabrication – it's replicable and uses open source technology. We started our research on knitting machines in 2012 by hacking and developing a new interface for the Brother electronic knitting machine. We developed a board called Knitic, which enables the control of obsolete machines and knit patterns via a computer. While developing Knitic, we already had in our minds that the future would be an open source knitting machine that can be made using digital fabrication tools. Our idea became reality towards the end of 2014 when we released Circular Knitic, an open source replicable circular knitting machine produced with digital fabrication and maker tools, like 3D printing, laser cutting, Arduino, and makerbeam. Circular Knitic also demonstrates that 3D printers are able to print different machines apart from the 3D printer itself.

The core idea behind the project and our research is to integrate textile fabrication to the maker culture. We strongly believe that craft can benefit from contemporary technologies and also other way round, we believe textile production has lots of potential in terms of innovation. There are many benefits to this new field, to name a few: desktop fabrication or knitting is still an undiscovered area; it can contribute to gender balance in communities of fabbers and makers; and let's not forget fashion sector, where designers are eager to work with knitted garments and make small-scale or unique productions; concerning pattern knitting, unique items are still difficult and very expensive to be knit, digital fabrication changes this. We believe all these revolutionary ideas behind soft digital fabrication can have a deep effect, provoking changes in the current situation as well as introducing new methods of textile fabrication.



## Sequence

'Sequence' is a bio-digital installation created by artist Anna Dumitriu, working in collaboration with digital artist Alex May. The project investigates the emerging technology of whole genome sequencing of bacteria, which makes it possible to study the entire genetic blueprint of an organism. The project considers what this new technology, which is revolutionising the study of bacteria, means to us personally, culturally and socially.

Dumitriu's artistic research has led to her learning how to sequence an entire bacterial genome, from the complex and delicate process of preparing the DNA, to sequencing and assembling the resulting data (around 2.8 million base pairs of DNA long) of the *Staphylococcus aureus* bacteria that lives on her own body.

She learned that this organism, which currently lives on her with no obvious effect, is likely to be a human pathogen, and under different circumstances could make her ill or even kill her. She also found out that it has several significant antibiotic resistance genes: the *blaZ* gene, which confers resistance to beta-lactams, such as penicillin; the *norA* gene which confers resistance to fluoroquinolones such as ciprofloxacin; and the *tet(38)* gene conferring resistance to tetracyclines such as doxycycline. It can be treated with methicillin and so is not a form of the famous methicillin resistant *Staphylococcus aureus* (MRSA).

The preparation of the DNA for sequencing is time consuming, and very high precision (Dumitriu needed to dilute the DNA so precisely that 1000000 fragments of it would cover 1mm of the flow cell used in the sequencer). The sequencer (they used an Illumina MiSeq) records images of light signals originating from fluorescent chemical compounds attached to nucleotides. Each nucleotide binds to a different coloured compound, and at each stage a digital image is taken. The machine then builds up a picture of what DNA is there and outputs a raw file of data. This data can then be assembled using software. Assembled genomes can then be compared to other assembled genomes to reveal how infections spread as minor changes in the DNA show how closely related one organism in a species is to another.

'The bacterium I have studied is one of millions which go to make up my microbiome. The detailed knowledge of this one organism only serves to highlight how little knowledge we have of the workings of our own bodies, as we reflect on the sublime microbiological worlds we carry with us.'  
(Dumitriu)



## Seven Seconds Ago



*Digital innovation needs to come from researching the wild: Elephants in Tsavo West National Park, Kenya.*

Britain has a very personal and domestic relationship with its wildlife. From our national pastime of feeding the bird table (damn those squirrels), to citizen science with BBC's Spring Watch, to listening to urban foxes reclaim the streets (and bins) in the midnight hours. The thing is, we like to be close to nature. And it's big business. In the UK, according to the British Ornithological society this is estimated at £200 million annually. This connection to just the birds in our garden is incredible. It's a formative part of our youth, a thing we do as soon as we have our first home and a thing we might do with our children and grandchildren, bringing live feeds (excuse the pun...) to our gardens and backyards through our windows.

So in crafting our digital futures for connecting to wildlife we wanted to think about how can we blend the physical world in order to create and curate new viewing experiences tailored to what we want. Watching a birdfeeder on YouTube (view hits 140K - and has a cat in it) has nowhere near the appeal of watching cats (if you're called Maru - 240M). But does digital really represent our physical world? I am sure that the views from global windows on birdfeeders would be in the billions. Illustrating that while you might not capture data in the real world, it's significance far outweighs digital.

Starting with the physical versus virtual viewing experience of birdfeeders from our homes, we wanted to think about how we can provide highly compelling, possibly magical viewing experiences of animals in far off places. Animals that we need to protect. Animals that are under threat from poachers, their changing environment and the impact of the growing human population.

Conservation has never been more important. We don't need to tell you this, but it doesn't help to be reminded every now and again! The way we connect to conservation in far off places is a priority concern for conservation and wildlife agencies globally as we know that what might happen to visitors to watering holes in Kenya, icebergs in the Antarctic or a carcass in the jungles of Bangladesh will in some form or another come to visit us in the not so far off future.

Digital camera and viewing technology is in a remarkable place right now - with lots of unexpected innovations changing how we capture and look at moving and still images. Google Cardboard (an open-source low-cost cardboard 3D viewer) is one of these innovations. The experience is staggeringly effective. If you haven't tried it, you should, as it illustrates that digital innovation doesn't have to come from silicon and (maybe shiny) plastic. Camera technology is also undergoing some interesting changes. We know that Kodak Moments are something of the past, but the playfulness of GoPro has been leapt upon by our growing Generation Z population.

With further simple physical innovations in camera tech, like the fisheye lense on GoPro, it's possible to completely change its appeal. Similarly a single camera pointed at a near perfect cone-shaped mirror can, with a little digital re-mixing, capture a 360° view using a standard lens. Oh and all of these cameras can now continuously stream via Wifi, 3-4G and Bluetooth - giving you a feed in any form anywhere in the world. A feed that isn't just for Gen Z's capturing their lives, but for everyone wanting to digitally connect to anything.

In Seven Seconds we wanted to harness this crafted digital viewing technology to find new ways to go about digital conservation. Playing on the notion that we want to make people closer to endangered animals (digitally!) we have built a viewing system that gives a live 360 viewing experience from anywhere in the world that you can connect to the web.

We want to expand how people are actively involved in digital conservation by capturing live (or as near as) footage and monitor wildlife activity. By streaming the content to citizen scientists - to people wanting to experience the thrill of watching eloquent giraffes stumble past, families of elephants shake the ground and inquisitive meerkats watching for approaching eagles - we want to make a difference through a unique data capture process. We've added a social feedback element to the device that enables viewers to confirm what they are seeing. Tap the button when you see a species. Look up for your identification list. Think you know what it is? Look down for the key facts. Make your choice. You will be helping to count, monitor and conserve wildlife. You're a citizen scientist - thousands of miles away - able to observe fascinating wildlife interactions and, encounters through innovative new technologies. You might be 5 or 85. You might speak Gujarati, Bantu Swahili or French... It doesn't matter. What does matter is that you are able to connect to far off animals that need your help now. And while this work is just off the shelf, we hope it will find new ways to open up open source hardware and software for global digital conservation.

*Project Team: Tim Brooke, Jack Chalkey, Ade Cockle, Alasdair Davies, Jon Rogers*



Lunchbreak in Mexico City during UKMX.

## Crafting The Digital

When Irini Papadimitriou asked us to write a reflective piece on crafting the digital that drew on the activities and content of this publication we decided to take an open ended, and perhaps somewhat wandering approach. An approach that mingled thoughts from personal interests and experiences as much as from our professional practice. An approach that wanders between the practicalities of approaching the creation of objects from a pre-industrial production stance to the sensitivities of crafting objects in relation to people and the complex messy lives they lead. We wanted to give our view on the ways in which the methods and mindsets of craft can provide a new perspective on the future of digital and the expectations, hopes and aspirations we have for it. We're Justin Marshall a Digital Crafts person, Jon Rogers a Creative Technologist and Jayne Wallace a Digital Jeweller.

We think that craft sensibility can extend beyond the scope of material interaction, to engagement with people and situations as a broadly empathetic way of exploring the world. In this way we are not limited to talking about craft as a specific area of professional practice, material specialism or a defined sector of the creative economy, but as a model for organising production (and consumption) and as an approach and mindset that can be recognised within many practices and professions. Before we start to apply this, let's define what we mean by 'pre-industrial forms of production'.

Pre-industrial forms of production can be characterised as being localised and flexible, often producing bespoke items or variants appropriate to the needs of an individual, a community, or the conditions of a particular place. Design and production are more intimately integrated than in the industrial mode of production and carried out by multiple small-scale enterprises; it is disaggregated rather than centralised and this is mirrored in how people purchase products, less homogenized and uniform, and perhaps more limited in choice, but more locally specific and relevant.

With this lens on where we are coming from in place, we need to ask the fundamental question of how is this relevant to the global marketplaces of today and ubiquity of the digital? We're going to respond to this by drawing on the many different voices and cultures that are captured in this publication. Starting with Miriam Mabel Martínez' piece 'Vanguardism of the Periphery' her group 'tour' of Mexico city is described in terms of a pre/post industrial cityscape of consumption and production, where there are areas in which 'every street is a specialized branch', small-scale individual businesses provide diversity and choice, not international, or even national, chain or department stores.

A store of digital devices and is visited which is described, (as is the whole city), as a 'lab' in which the proprietor does not just sell, but also creates, bespoke and personalised digital devices, in pre-industrial craft terminology he runs a work-shop a place of design, production and consumption. Other descriptions of visiting a 'bazaar' of digital componentry, in which everything makers needs to wrangle their own personal digital devices is available, conjures up a vision that is truly the antithesis of an Apple Store.

But this, of course, is not peculiar only to Mexico, these descriptions align with the authors' collective experiences of a recent visit to the historic, but highly active and commercially vibrant, Chandni Chowk market in Delhi. This is made up of vast numbers of small-scale specialist businesses, aggregated into areas of specialisation, providing the benefits of choice and variety, but without being conglomerated into single large stores. Differing commercial activities sit alongside each other here, areas of locally produced and context specific products and services rub up against areas, such as the electronics market, which draw on global distribution networks; the pre-industrial meets 21st century business models in ways that appear to meet many of the current needs of local consumers. In addition this model empowers local entrepreneurs, providing opportunities and space, that, if businesses became subsumed into larger corporate structures, would not be available. The power and value of the local is raised in other DDW texts. Andrew Prescott in 'Being Local and Connected' demonstrates how the 'local can retain its distinctive character in an increasingly globalised and corporate world' with an example of how at the end of the 19th century the city of Hull, reacting against the monopolies and high costs of large private telephone companies, set up their own telephone systems. This is made wonderfully tangible through a network of white rather than red phone boxes, a physical manifestation of civic pride and power.

A parallel might be drawn here with the virtual space of the web, it's not meant to be a single place (e.g. Facebook), it's meant to be lots of disaggregated interconnected, emergent places, a bazaar, not a Wal-Mart. Miguel Angel Angeles highlights this in his piece on 'Coding Mexico' where he describes this megalopolis as a 'multi-coloured algorithm called Mexico', which conjures up more than colour, but texture and the very materiality of place. This lovely way of thinking about a city is a call to action to take a crafted view of the things we do in a city - where there is 'no limit and no format'. This captures the very essence of a web that is not a homogenous smooth material but is rather a complicated variable structure containing many different textures. It is this very materiality and physicality of digital and the web that we want to talk about.

Sensitivity to the affordances of materials and celebrating process through making its traces visible, are commonly understood as part of the ethos of a craft practice. There is a useful distinction that can be drawn out here between how many industrial designers approach material characteristics and how craft practitioners deal with physical affordances and approach the inherent inconsistencies of natural materials. Arguably a prevailing aspiration of the industrial designer is to work with materials with definable ubiquitous characteristics that allow repeatability and consistency; to have complete control of materials and to render the process of production invisible. In contrast, the perhaps humbler, overriding craft approach is to work with the inconsistencies in materials and specific situations; to make process manifest, to work with, not against, the knots and grain in wood, take on the complexities and contradictions in human needs and desires and to be sensitive to the opportunities they may hold for revealing new possibilities for expression and avenues of investigation.

There is a relinquishing of control, even if only partly or intermittently, therein. This is not to align only, or all, beneficial characteristics to a craft approach to the detriment of design, that would be a falsehood - but collectively we have talked about what craft as an ethos and way of doing enables, in our views, and where this departs from design.

In the context of craft and the digital the different approaches to materiality yield very different visions of what our digital culture can be and what it means to be a human living amongst and through these things. The 'industrial' approach assumes, or commonly aspires to, digital 'smoothness', where there is consistency and ubiquity of access and bandwidth - and largely achieves this with big expensive tools. The reality of the digital as a material however, is often lumpy and inconsistent. The digital craft approach recognises that there are digital knots, veins, ages, thicknesses - so when we do not have the quantitative power of the latest technologies, the fastest broadband or the democratic benefits of open and unrestricted access, we may need a qualitative and sensitive approach in order to craft valuable outcomes through taking a very human perspective. To enable this to happen, we also need to be including open and collaborative methods that the communities of hackers, makers and tinkerers are attempting to do. We say attempting, as we don't think they're there yet, but it feels the right way to start to deal with this very material, complex digital space that we are working in.

With that said, we wanted to talk a bit about how design fits in with this. As where design thinks very generally about what humans are, what human experience is and what human relationships are like, craft has always been in the business of thinking about the individual, their idiosyncrasies, their atypical ways of being and responding to these more specific quirks, oddities and lack of 'smoothness'.

There are parallels to be made between how a craft approach works things out in the situation, recognizes that you need to expect surprises, and through an iterative process moves forward to reach an, often provisional, resolution, and how a craft driven vision of our digital culture opens up new possibilities for individual, atypical things, systems and personal agency. In responding to the quirks of being human you find sets of different constraints that make you think very differently about potential outcomes. Just as we experienced when working in India and Mexico, there were very strong socio-cultural-economic constraints there that made people think very differently about how you could produce something and what it was you would produce. Many of the ad-hoc networks and processes that we saw playing out demonstrated how what craft does is utilise the idea of 'to-hand-ness' and the specificity of the situation. That might be just in terms of materials and tools or networked process, but as we know from our own experiences, and as shown in much of the writing in this book, this also extends to making changes in socio-political contexts. This opportunistic approach, employing ad-hoc solutions that become refined through iterations underlies working with a knotty piece of wood as much as working within complex social contexts. This is the antithesis of much sophisticated industrial design, particularly in relation to the digital, where the designer is not looking to what is to hand, but aggregating a whole global potentiality for production.

Although we would emphasise that crafting, as a process, does not have only to be aligned with creation of physical items, we believe that a recognition of the value of physicality and the physical characteristics of objects is still an important aspect of a digital craft sensibility - emphasising the 'thing' in the internet of things. That we are learning from our thousands of years history of making in a physical world to influence the twenty five years of making in a digital connected world. Goldsmith's Interaction Research Studio's 'Datacatcher' project provides some useful discussion points here. Through the deployment of bespoke mobile physical devices this project provided the public with a way of accessing the 'sociopolitical texture of local neighbourhoods'. In response to this project the question 'Why is it not an app?' was often raised. Although it may be true that all the device's functionality (and much more) could have been achieved as an app, Bill Gaver argues, as would we, that the project's impact and value would have been challenged. In the project's documentary film participants discuss the importance of the unique form and physicality of the device, the Datacatcher's 'quirky' characteristics whetted public interest and instigated new interactions and conversations about the data being displayed and what it means to them - one of aspirations of the project. Unlike an app running on a ubiquitous digital device, the Datacatcher's form embodies and promotes its function.



The 3D printed devices may not immediately exude all the characteristics one might want and expect from a crafted object, but they are bespoke artifacts, tailored to a specific context and crafted to achieve a limited set of very particular tasks, they are 'made-to-measure', and therefore can be set against the multi-functional universal design of many mass produced digital devices. There is a strong sense in Gaver's work and other work within this publication that is calling for a future where the things we have closely correlate to, and naturally fit with, the values we might live our lives by. That things might be with us for generations and they will draw from many global cultures – cultures that exist beyond the industrial view of a smooth digital future.

This aspiration connects to what Irini and the V&A instigated in the UKMX event and the unfolding stories. Immersing yourself in different cultural contexts enables you to see digital in a new way, particularly when they're craft based economies – if we are going to learn about the future we probably don't want to go to Silicon valley, because we are not going to craft the future with Apple, Google and Amazon at the helm. We think it's going to come from unexpected places – we don't know where, but going to places like Mexico and connecting to their cultures of digital making is one strategy for investigating this and may give rise to some very alternate and bespoke digital futures. If we also look closer to home, 'imperfect' digital devices and systems are being created with an open source ethos by independent innovators at hackathons and in makerspaces and fablabs across the world. These emerging networks are getting traction with some big organisations, as we can see in the way the Mike Saunby at the Met Office talks about where the future of digital is going to come from.

As a final thought we want to reflect on a quote within Andrew Prescott's piece, where he writes 'Networks can enable the local to be linked into the wider world, but still allow a distinctive local character.' This sensitivity or attunement to the 'local' when creating connections between people, things and places through the digital, is something that we recognise as a characteristic of a craft approach, it enables people, places and their 'things' to retain their particular and idiosyncratic textures. We know that whatever happens, we're going to walk into our digital futures, this much is certain. Our proposition to you is whether we take the choice to create a crafted digital future or something else altogether. With this in mind, let's look at what this means from the two perspectives we outlined at the start of our reflection and why this matters to us. Craft and pre-industrial production and in relation to a sensitivity to things, people and process that focuses on the individual and the idiosyncratic. This is in contrast to the current model of global infinities in terms of production networks, materials, processes and homogeneity of form.

This is a model where you'd never in a small city like Dundee having anything to offer Mexico City; you'd never stop to ask people in India why they are making things and reflect on why we're not? You'd never learn anything from the thousands of years humanity has spent crafting a remarkable existence on a simple big round rock with one hundred and eighteen building blocks to make things with. And perhaps as Andrew Prescott has said: 'Larkin cherished Hull's sense of being on the edge, of creativity flowing from the anomalous, marginal and misplaced.' this might just be the poetry we all need to reflect on in order to start to think what our crafted digital future might be.

*Team: Justin Marshall, Jon Rogers and Jayne Wallace*



Shelves of electronics in Mr Sulca's Electronic Shop.

Image Credits

In order of appearance in the book:

British Council: MX  
Photo © William Strong

CCD: Pepe Flores  
Photo © Arturo Téllez and Diego Delgado

CCD: Miriam Mabel  
Photo © Estefani González

Laboratorio para la Ciudad  
Photo © María García Holley

Small City Lab  
Photo © Ed Broughton

Laboratorio Arte Alameda  
Photo © Laboratorio Arte Alameda

Uniform: UKMX  
Photo © Martin Skelly

TapWriters  
Photo © Michael Shorter

Interaction Research Studio:  
Photo © Interaction Research Studio 2015

Future Cities Catapult  
Photo © Future Cities Catapult

AHRC: Andrew Prescott  
Photo © AHRC

AHRC: Tangible Memories  
Photo © Barney Heywood

AHRC: Latino  
Photo © Brian Mackern

AHRC: Affective Digital Histories  
Photo © Gino Attwood

Met Office: Informatics Lab  
Photo © Adam Burt

Fixperts: #fixingattitudes  
Illustrations © Koby Barhad (x3), 2014

New Civic  
Photo © Sarah Gold

Instruments of the Afterlife  
Photo © Burton Nitta

Circular Knitric  
Photo © Mar Canet, 2015

Sequence  
Photo © Anna Dumitriu and Alex May

Seven Seconds Ago  
Photo © Olivia Needham

All images are copyright to  
their respective owners.

Funded by:



Supported by:



Contact:

Irini Papadimitriou  
Andrew Prescott  
Jon Rogers

[i.papadimitriou@vam.ac.uk](mailto:i.papadimitriou@vam.ac.uk)  
[andrew.prescott@kcl.ac.uk](mailto:andrew.prescott@kcl.ac.uk)  
[j.rogers@dundee.ac.uk](mailto:j.rogers@dundee.ac.uk)

ISBN 978-0-9576868-4-7



9 780957 686847

Cover Yellow Stock.  
Not printed yellow

ISBN 978-0-9576868-4-7



9 780957 686847