RTD2015

21ST CENTURY MAKERS AND MATERIALITIES

The 2nd Biennial Research Through Design Conference | 25–27 March 2015 | Cambridge UK

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John Vines | *Newcastle University*

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Nadine Jarvis | *Goldsmiths, University of London*
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Abigail Durrant | *Newcastle University*

Exhibition Curators:
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Jayne Wallace | *University of Dundee*
Joyce Yee | *Northumbria University*

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Welcome to Research Through Design 2015

It's a great pleasure to welcome you to the second biennial Research Through Design conference, RTD 2015. We're excited to be holding the conference in the city of Cambridge and to the new European lab of Microsoft Research, kindly hosting us this year.

RTD is a new conference that supports the dissemination of practice-based design research through a novel and experimental format, at the heart of which is a curated exhibition accompanied by round-table discussions in 'Rooms of Interest'. RTD 2015 builds on the success of the inaugural conference held at the BALTIC Centre for Contemporary Art in 2013. RTD is envisioned as a new platform for design practitioners and researchers to communicate their design-led inquiry in a manner that emphasises the things that they make and nature of their practice as being central to what they do and who they are. The RTD format places designed artefacts at the centre of proceedings, in both the dedicated exhibition space and Rooms of Interest; artefacts are brought from the exhibition into each round-table discussion to talk to and be handled by presenters and delegates; artefacts may also 'speak' in this dissemination context.

The RTD format is seen as a departure from the traditional conference format of paper presentations delivered to audiences in darkened lecture theatres. We have encouraged the submission of 'research through design' that leverages visual argumentation, and the configuration of the exhibition and round-tables is intended to foster dialogue in keeping with values of egalitarianism and inclusivity. In the spirit of the design school critique or 'crit', discussion around work is intended to generate critical reflection and debate

about the artefacts and processes of design as a form of inquiry, and how these may be encountered by others to invite new ways of making, knowing, living and being.

The theme for the conference this year is 21st Century Makers and Materialities, with which we hope to raise discussion and debate around designers' relationships to making things, and what this means in light of emerging tools and materials. Certainly, 'maker' identities have gained new significance in recent times, as new technologies (such as 3D printing) proliferate. Concurrently, novel ideas are circulating about the nature of knowledge generated through design, leading to reconceptualisations of knowing through making, with understanding 'entangled' between people and things. We also recognise that new materials (such as bioengineered textiles) and new disciplines (such as synthetic biology) prompt new ways of working – and making sense of the world – that involve reimagining maker identities and their relationship to design. RTD 2015 aims to foreground emerging kinds of practice and new materialities of design research that are currently being explored, to give visibility to the complex, multiple, and diverse identities of design practitioners and their research in the 21st Century.

In keeping with this aim, this year's conference offers an eclectic programme of peer-reviewed work accepted into both the exhibition and the archived proceedings. It is a mix of bold, experimental, and in some cases, provisional pieces. We have been greatly inspired by the quality of this year's submissions, especially considering the infancy of the conference. At Stage 1 – where we invited authors to submit abstracts and visual documentation of their work – we received 223 submissions. Following an initial round of double blind peer-review, 65 of these submissions were invited to Stage 2, and, after a further stage of review, 34 of these were selected for inclusion in the programme (15% of the initial submissions). Considerable care has been taken to ensure continuity and rigour throughout the submissions process, in this period of establishing this new format and the RTD series. The 2015 programme truly highlights the diversity of contemporary research through design, with authors representing fashion, graphic, industrial, architectural, interaction, and speculative design practice, amongst other areas.

RTD 2015 also has an exciting programme of invited 'Provocations' – plenary talks to inspire and provoke further discussion and debate on the conference themes. As such, Provocations builds on the progressive introduction of debates at the Design Research Society (DRS) conference in 2014. In keeping with this year's focus on 21st Century Makers and Materialities, we have invited provocateurs who embrace hybrid identities across fields of design, and who are sensitive to pedagogical concerns surrounding the future of practice-based design research.

The creation of the RTD 2015 programme was a collaborative endeavour, and the conference would not be happening without the considerable time, energy and passion invested by a large team of people. First and foremost, we would like to thank all of the authors whose wonderful work makes RTD what it is. We are hugely grateful to the Programme Committee members who have thoughtfully handled submissions, contributing specialist expertise in a wide range of fields. We are particularly grateful to Justin Marshall, Nadine Jarvis and David Cameron, who have worked closely with us as Submissions Chairs, to Joyce Yee and Richard Banks who have carefully put together the exhibition based on work that was accepted, to Jayne Wallace and Jon Rogers for all their input to the event documentation, and to Tim Regan, Tess Denman-Cleaver, Tommy Dykes and all the wonderful student volunteers for their support to event organisation. Also, we sincerely thank our reviewers, who have committed considerable time and effort to provide helpful and timely feedback to our authors, and the designers who have supported us with communications. Finally, we must thank those organisations that, as our key sponsors, have been instrumental to making the conference happen: Microsoft Research, Newcastle University, University of Dundee, and Falmouth University.

RTD 2015 General Chairs:
Abigail Durrant & John Vines

Conference Overview

A detailed schedule of presentations and events on each day of the conference follow, on: page 18 (Day 1), page 60 (Day 2), and page 84 (Day 3).

Conference Eve: Tuesday 24 March

Time	Event
14:00–18:00	Registration opens at Venue
16:00–16:45	Ambulation 1
18:00–18:45	Ambulation 2
19:00–til late	Informal Social at Local Pubs

Day 1: Wednesday 25 March

Time	Event
08:00–09:30	Registration
09:30–10:45	Welcome and Opening Address
	Plenary Session: Opening Provocation
10:45–11:15	Morning Break
11:15–12:55	Rooms of Interest
12:55–14:00	Lunch Break
14:00–15:40	Rooms of Interest
15:40–16:10	Afternoon Break
16:10–17:10	Plenary Session: Provocation
17:10–18:00	Evening Break
18:00–20:00	Exhibition & Drinks Reception

Day 2: Thursday 26 March

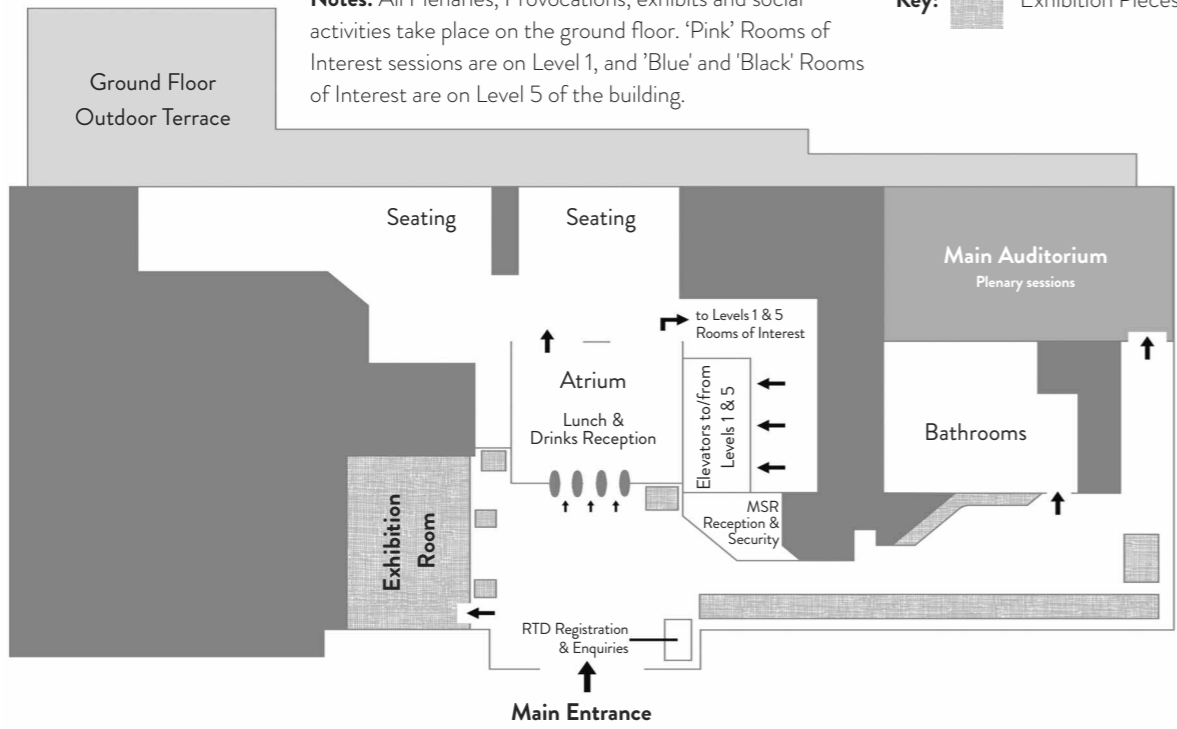| Time	Event
08:00–09:30	Registration
09:30–10:15	Plenary Session: Documentation of Day 1
10:15–10:45	Morning Break
10:45–12:25	Making Space
12:25–14:00	Lunch Break
14:00–15:40	Rooms of Interest
15:40–16:10	Afternoon Break
16:10–17:10	Plenary Session: Provocation
17:10–18:00	Evening Break
18:00–18:30	Coaches to Jesus College Cambridge
18:30–til late	Drinks Reception & Conference Dinner

Day 3: Friday 27 March

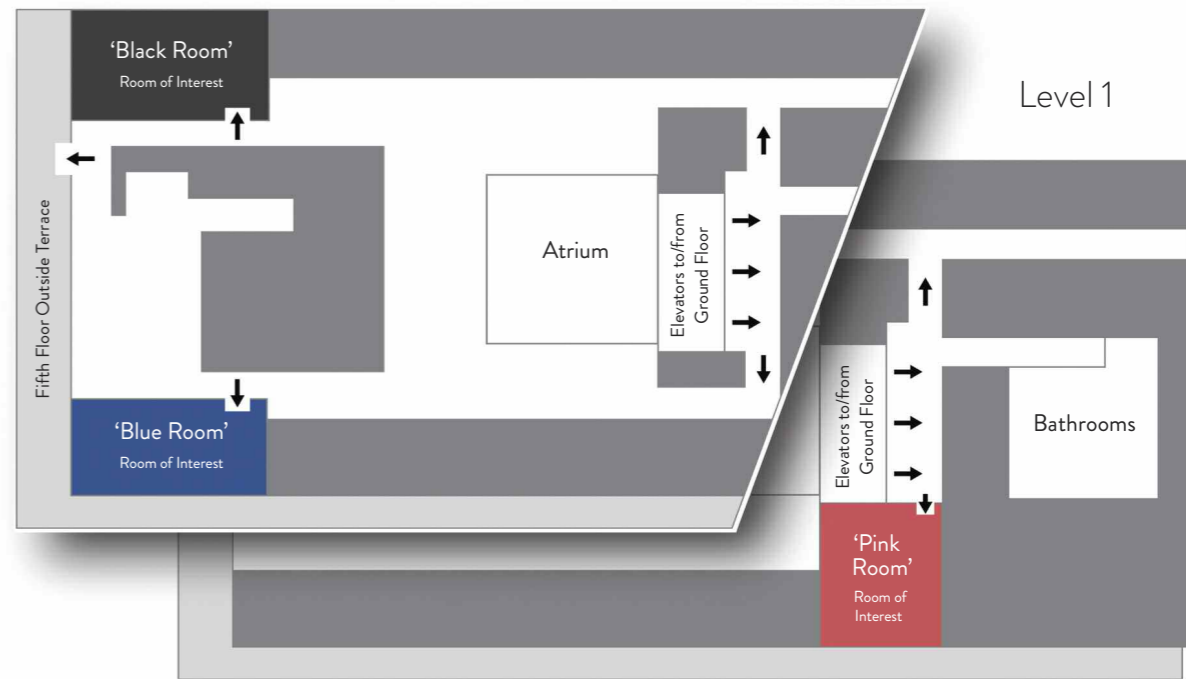| Time	Event
08:00–09:30	Registration
09:30–10:15	Plenary Session: Documentation of Day 2
10:15–10:45	Morning Break
10:45–12:25	Rooms of Interest
12:25–14:00	Lunch Break
14:00–15:40	Closing Provocation
15:40	Conference Close

Map of the Venue: Ground Floor

Notes: All Plenaries, Provocations, exhibits and social activities take place on the ground floor. 'Pink' Rooms of Interest sessions are on Level 1, and 'Blue' and 'Black' Rooms of Interest are on Level 5 of the building.

Key: ▨ Exhibition Pieces

Ground Floor Outdoor Terrace

Seating

Seating

Main Auditorium
Plenary sessions

to Levels 1 & 5
Rooms of Interest

Atrium
Lunch &
Drinks Reception

Elevators to/from Levels 1 & 5

Bathrooms

MSR
Reception &
Security

Exhibition Room

RTD Registration
& Enquiries

Main Entrance

Level 5

'Black Room'
Room of Interest

Fifth Floor Outside Terrace

Atrium

Elevators to/from Ground Floor

'Blue Room'
Room of Interest

Level 1

Elevators to/from Ground Floor

Bathrooms

'Pink Room'
Room of Interest

On the Eve of RTD 2015

▨ In Cambridge, around the venue | Conference Eve | 16:00 onwards

▨ For those arriving in Cambridge on the conference eve, we have a few social events organised, for meeting fellow attendees and exploring the local area. Sound artist Tim Shaw will be performing two Sound Walks, starting and finishing at the conference venue. We also recommend a number of designated local public houses and hostelries where Student Volunteers (SVs) and Conference Organisers will be waiting to welcome delegates. Please see the map in your delegate pack for details.

Ambulation
Tim Shaw | Newcastle University

During a 30-minute walk through a specially chosen area of Cambridge, 10 participants, each wearing wireless headphones, will receive a live audio feed from their immediate surroundings. Sounds are processed, layered and re-introduced by the artist directly into the participants' headphones as the walk continues. Incorporating methods of improvisational performance, this artwork offers a sound responsive journey through urban space, immersing the audience into a familiar yet abstract environment. Ambulation plays with memory, intuition and impulse, forming a live improvisation with the immediate soundscape, and a unique experience each time it is performed.

Ambulation will run twice on the eve of the conference (Tuesday 24th March) at 16:00 and again at 18:00.

Shaw | *Ambulation* | *© Le Musée imaginaire 2014*

Documenting the Conference

A key feature of RTD 2015 will be the documentation of the unfolding conference experience. Based on feedback from the inaugural RTD, for this year's programme we are exploring a number of ways to capture rich discussions taking place during the Rooms of Interest sessions and beyond. This is in part a response to how conventional conference publications focus on documenting the presented work in the form that it was accepted prior to proceedings. Arguably, one of the specific traits of design research is that its artefacts carry knowledge; therefore there is rich potential to capture the nature of this artefact knowledge in terms of how delegates orientate to it in the dissemination context. For RTD 2015 we've recognised this new potential to document people's conference experiences that incorporate the unique and often performative presentations of work and the rich discussion that takes place around its presentation.

Documentation at RTD 2015 will take a number forms. Firstly, there will be a number of Scribes capturing the discussions surrounding presented work through novel creative means including sketching and commentating. Jon Rogers and Jayne Wallace, our Documentation Chairs, will be hosting plenary sessions during the conference that reflect back to delegates the scribes' impressions captured so far.

Secondly, we invite the delegates to contribute to the RTD 2015 documentation through the use of Bootlegger, developed by a team of researchers at Newcastle University. This is a simple video-based Android application available from the Google Play store, which prompts its users to record snippets of video from sessions, share views and reflections on the conference discussions, and video-document

Presentation at Praxis + Poetics: RTD (2013) | *© Matthew Coombes*

engagement with exhibits. A small team of researchers from Newcastle will be at the conference to help people install and use Bootlegger.

And finally, Bettina Nissen from Newcastle University will host a making activity throughout the conference. Bettina will be producing 3D printed artefacts for attendees to keep as mementos. Each memento will be unique to reflect individual impressions shared with

Bettina and expressed on social media, forming a momentary fossilisation of RTD 2015 experiences.

Through these various endeavours we hope to document and support reflection on those valuable exchanges around people and their work that can easily be lost once the conference event is over. Our longer term ambition is to incorporate the documented experiences alongside the online proceedings into an experimental 'rich text' publication.
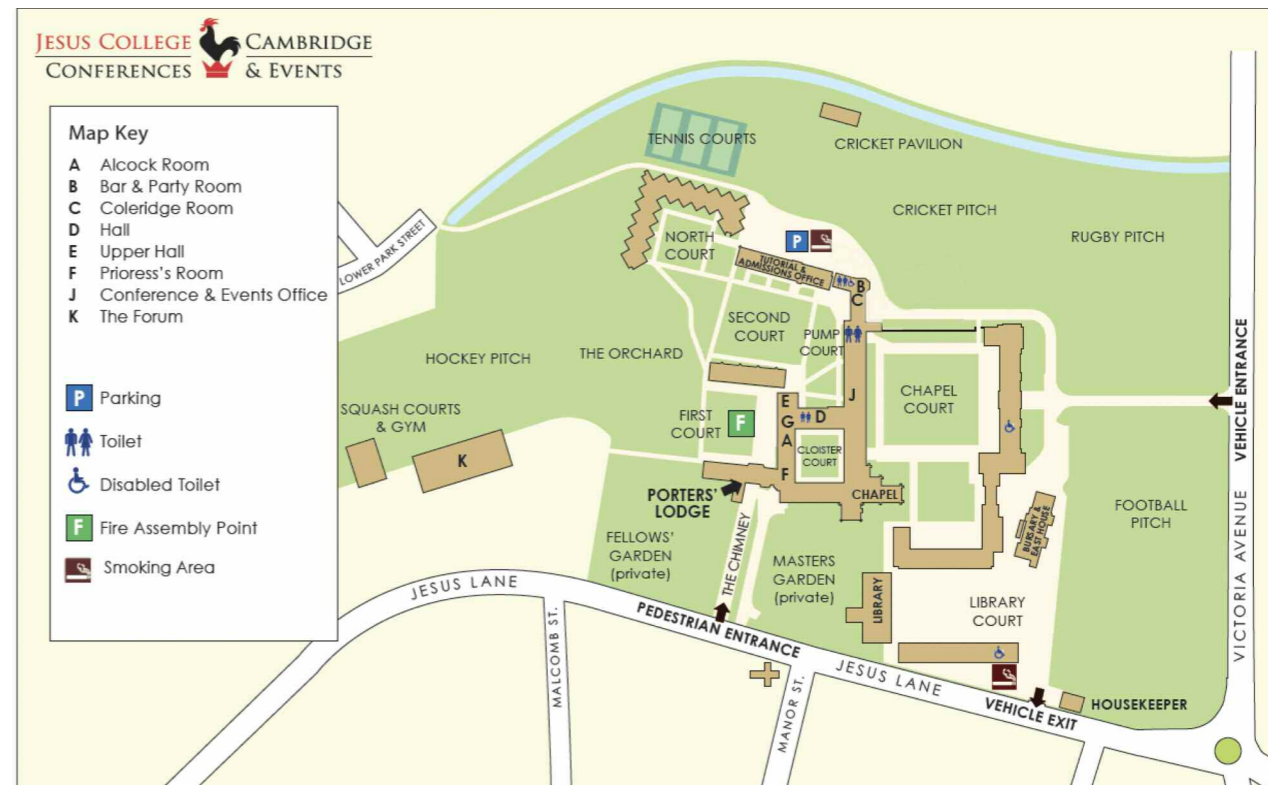
Conference Dinner

We are holding our conference dinner at Jesus College Cambridge on the evening of the 26th March, for those who have registered to attend it. Coaches are booked to transport people directly to the dinner venue, leaving from the conference venue at 18:00. If you'd prefer to make your own way there, Jesus College is approximately a 25-minute leisurely walk across the city from the RTD 2015 venue.

There will be a drinks reception between 18:30 and 19:30 in the characterful Prioresses Room and Cloisters (see (F) on the Jesus College map).

A three-course sit-down dinner follows at 19:30 in the Upper Hall (E). If you haven't yet registered for the dinner, but would like to do so, please let the registration desk know.

Jesus College Cambridge
Drinks reception from 18:30, dinner 19:30 to late

RTD2015
Coaches leaving from Microsoft Research building between 18:00 and 18:30

JESUS COLLEGE CAMBRIDGE
CONFERENCES & EVENTS

Map Key

A Alcock Room
B Bar & Party Room
C Coleridge Room
D Hall
E Upper Hall
F Prioress's Room
J Conference & Events Office
K The Forum

P Parking
   Toilet
   Disabled Toilet
F Fire Assembly Point
   Smoking Area

Day 1: Day schedule and Rooms of Interest presentations

08:00–09:30	Registration
09:30–10:45	**Plenary Session: Main Auditorium**
	Welcoming Address: Abigail Durrant & John Vines
	Opening Provocation: Nelly Ben Hayoun
10:45–11:15	Morning Break
11:15–12:55	**Rooms of Interest: Pink Room** / **Rooms of Interest: Blue Room** / **Rooms of Interest: Black Room**
	Making Real / **Realising New Materialities** / **Multiple Voices in Design**
12:55–14:00	Lunch Break
14:00–15:40	**Rooms of Interest: Pink Room** / **Rooms of Interest: Blue Room** / **Rooms of Interest: Black Room**
	Experiential Engagement / **Dialogue with Practice** / **Imagined Worlds**
15:40–16:10	Afternoon Break
16:10–17:10	**Plenary Session: Main Auditorium**
	Provocation Panel – Question Time: John Bowers, Bill Gaver & Jonas Löwgren
	Moderated by Carl DiSalvo
17:10–18:00	Evening Break
18:00–20:00	Drinks Reception: Atrium space

ROI: Pink Room 11:15–12:55 Making Real

Agi Haines | Understanding The Human Object: 'If you prick us, do we not bleed?'
Natsai Audrey Chieza *et al.* | Design in the Age of Living Technology
Mike Thompson *et al.* | FATBERG: Chapter 1

ROI: Pink Room 14:00–15:40 Experiential Engagement

Susana Cámara Leret | Kindred Spirits: Smell fictions and performative design research
Liz Edwards *et al.* | Walking Off The Garden Path: A design journey
Jeroen Peeters *et al.* | Reflections on Designing for Aesthetic Engagement

ROI: Blue Room 11:15–12:55 Realising New Materialities

Carole Collet *et al.* | Botanical Fabrication
Jane Scott | Mutate: The evolution of a responsive knit design system
James Pierce *et al.* | Obscura 1C Digital Camera

ROI: Blue Room 14:00–15:40 Dialogue with Practice

Caroline Powley | Exploring interpretation as a creative strategy within type design
Nithikul Nimkulrat *et al.* | Ways of Being Strands: Exploration of textile craft knots by hand and mathematics
Martin Salisbury *et al.* | Engineering the Book: The relevance of material design to investigations of the picturebook, comic and graphic novel

ROI: Black Room 11:15–12:55 Multiple Voices in Design

Jane Norris | Making Polychronic Objects: Can an aerial perspective, crumpled time and material democracy, reframe material choice in objects?
Rachel Clarke *et al.* | Photo-parshiya: Discursive assemblages in an international women's centre
Adam Parkinson *et al.* | HapticWave: Presenting the multiple voices, artefacts and materials of a design research project

ROI: Black Room 14:00–15:40 Imagined Worlds

Guy Schofield | R.O.V. Digital Artwork as Narrative Controller
Mark Selby *et al.* | Experiential Manufacturing: The earthquake shelf
Anthony Forsyth *et al.* | Seeing the Light: Finding the poetic content of design objects

Opening Provocation: Nelly Ben Hayoun

Main Auditorium | Day 1 | Morning session

Dubbed the Willy Wonka of Design and Science, award-winning director and designer of experiences, Nelly Ben Hayoun is a critical explorer and a fearless and passionate provocateur. In 2013, Icon Magazine nominated Ben Hayoun as one of the 50 international designers "shaping the future". She is the Designer of Experiences at the SETI (Search for Extraterrestrial Intelligence) Institute, Head of Experiences at We Transfer, and a member of the Space Outreach and Education committee at the International Astronautical Federation. Wired magazine awarded Nelly Ben Hayoun with a WIRED Innovation fellowship for her work to date and its potential to make 'significant impact on the world '. Ben Hayoun previously collaborated with Beck, Bobby Womack, Damon Albarn, Maywa Denki, Bruce Sterling and Penguin Café in a musical collaboration that took music into space. Blasted in space from a Japanese launch pad in August 2013; she assembled and directs the International Space Orchestra (ISO) - the world first orchestra of space scientists from NASA.

Notes:

Understanding The Human Object: 'If you prick us, do we not bleed?'

| **Agi Haines** | CogNovo, Plymouth University | *agi@agihaines.com*

Pink Room | Day 1 | Late Morning session

Abstract: This paper outlines the inspiration, process and ideas behind a design project regarding human relationships with humanoid robots. Taking a research through design approach, an interactive animatronic head is created to further knowledge and ideas exchange concerning the potential future of robotic relationship design. The responding robot that reacts to negative stimuli manipulates and measures the viewer's emotional arousal.

The robot is programmed to respond in different stages of intensity based on the person's action towards it, predicting that a stronger response from the robot will produce a more intense emotional reaction from the person interacting with it. The robot then becomes not only an art piece in itself but also a tool to capture scientific data, furthering research and discussions.

This data can then be used to form a greater understanding of sympathy and guilt towards non-human objects, and help demonstrate what sort of role design might play in this interaction.

Keywords: bionics, humanoid, emotive-biosignals, praxis, reactive.
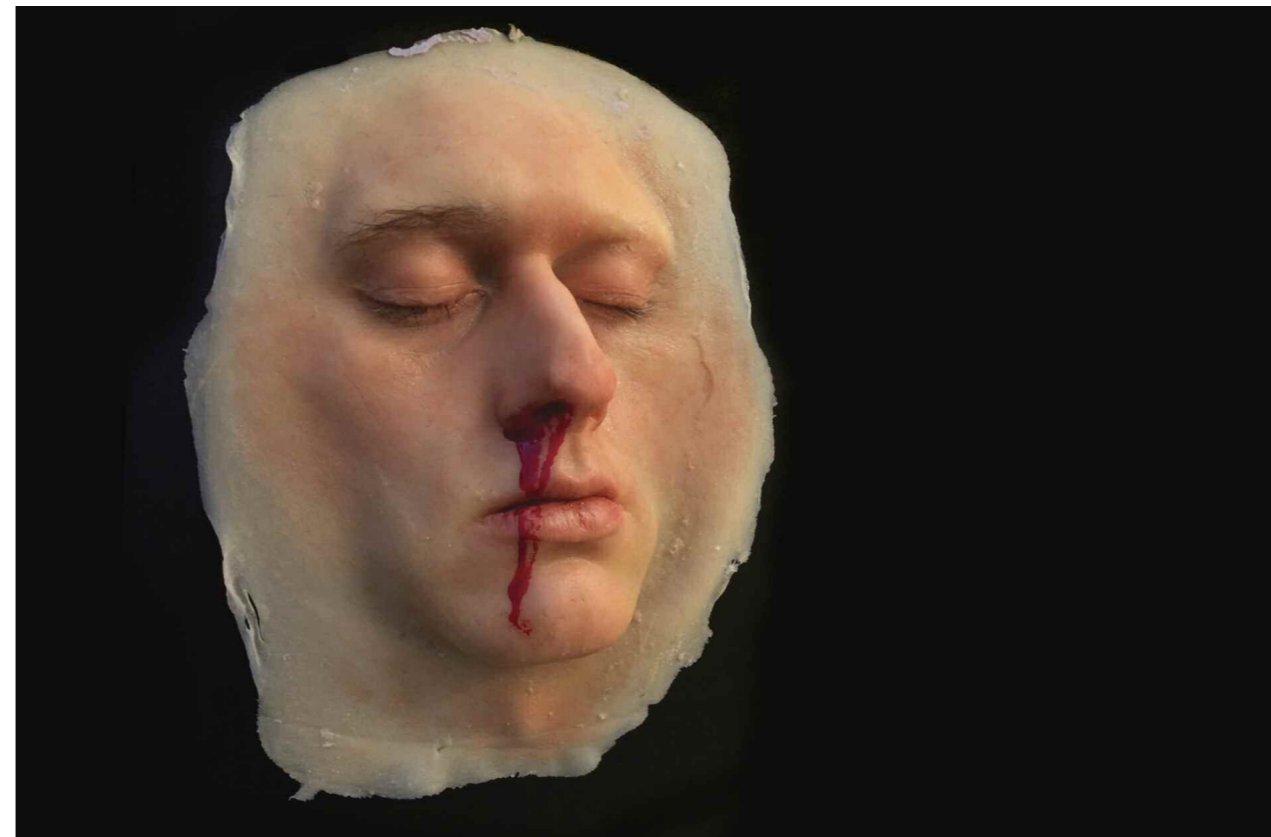
Haines | Hemorraging Robot | © Haines 2014

Design in the Age of Living Technology

Natsai Audrey Chieza | Textile Futures Research Centre | *studio@natsaiaudrey.co.uk*
John Ward | University College London | *j.ward@ucl.ac.uk*

Pink Room | Day 1 | Late Morning session

Abstract: The creative application of emerging biotechnologies in design has begun to influence how we perceive our material world, boldly suggesting a conceivable balance between concepts of industrialisation vis-à-vis the conservation of our natural ecologies. Embedding humanities practitioners in areas of scientific research, and vice versa, could be key to realising aspects of this utopian ideal.

Faber Futures is an on-going collaborative research project that asks if designing with living systems offers a better material paradigm for the design landscape. The project aims to combine design thinking and science knowledge to establish bacteria as component materials that offer sustainable alternatives to polluting industrial processes.

Key research explorations into ways of making have inspired the development of a protocol that captures pigment secreted by bacteria to dye textiles. By harnessing bacteria that naturally produce we have established a reliable manufacturing method that permanently transfers a colourfast biopigment without hazardous runoff.

Mastering the fundamentals of laboratory protocol has been a vital enabling factor for the designer to draw real-life working prototypes. When merged with the design hand, the creation of these artefacts suggest that scaling production for a hypothetical consumer market can be a factor of design-centred interventions as well as the application of synthetic biology.

Keywords: biodesign, biofacture, bacteria, material cultures, craft, textiles.

Chieza et al. | *Faber Futures, Fold, 2014. In vitro dyed 550 x 550mm silk pongee scarves* | *© Natsai Audrey Chieza 2014*

FATBERG: Chapter 1

Mike Thompson | Thought Collider Studio | *info@fatberg.nl*
Arne Hendriks | The Incredible Shrinking Man | *info@fatberg.nl*

Pink Room | Day 1 | Late Morning session

Abstract: Looking out towards the ocean, Fatberg is easily spotted by the flock of seagulls circling above, swooping down to nibble on its vast store of energy, a few square metres of the manmade island hoist themselves above the waves, slowly bobbing up and down, side to side. If you ask the creators of Fatberg why they made it, you might hear: we feel the need to archive our times; or, we're building a strategic reserve, anticipating difficult times ahead. Whatever the reason for its creation, they sensed its need to exist, as a point of reference of fat's emergence as the iconic substance of our time.

Fatberg is an ongoing critical design research project. A series of public design experiments, exhibitions and discussions, focused on the construction and growth of a floating island of fat – the Fatberg.

We present observations from Fatberg: Chapter 1, developed in the build up to the project launch at MU (Eindhoven) during Dutch Design Week 2014. The exhibit and accompanying paper focus on the emergence of the Fatberg, illustrating the process and knowledge developed through our experiences of 'getting to know fat'. Subsequently, we lay claim to the Fatberg as research territory, outlining the scope of our ambition.

Keywords: critical reflective practice, knowledge creation, thinking through making, innovation, independent / entrepreneurial research.

Thompson et al. | *Beginning to build the berg during Dutch Design Week 2014* | *© Hanneke Wetzer*

Botanical Fabrication

Carole Collet | Central Saint Martins, UAL | *c.collet@csm.arts.ac.uk*
Guillaume Foissac | EDF R&D | *guillaume.foissac@edf.fr*

Blue Room | Day 1 | Late Morning session

Abstract: Botanical Fabrication is an on-going research initiative which investigates how an understanding of botany and horticultural techniques can challenge the design process and lead to alternative sustainable manufacturing or 'eco-facturing' tools.

This paper presents different phases of the project, from an initial research workshop (2012), to an exhibition-based experiment (Botanical Factory, 2013) and includes current work in progress (Solar Gourd, 2015) so as to articulate a critical analysis of the work to date. In a context where we urgently need to devise new principles to live, manufacture and consume within the ecological capacity of our finite planet, the paper argues for the development of a new framework for slow manufacturing with plant systems.

From Darwin's research into plant movements to our current understanding of plant physics and biomechanics, designers can begin to integrate botanical and horticultural knowledge to play with the environment of plant growth and envision production chains of a new type.

Keywords: botany, plant physics, industrial design, future manufacture, sustainability.

Collet et al. | *Solar Gourd: Concentrated parabolic solar collector* | © Guillaume Foissac 2015

Mutate: The evolution of a responsive knit design system

| **Jane Scott** | Central Saint Martins, UAL / University of Leeds | j.c.scott@leeds.ac.uk

Blue Room | Day 1 | Late Morning session

Abstract: This smart textile design research is located at the intersection of biomimicry and responsive material systems. Using the inherent properties of natural fibres and knit structure, the aim is to develop responsive knitted fabrics, which question the conventional material systems necessary for smart textile design.

The work is informed by biological models derived from biomimetic research. Underpinning design research is a functional analysis of the responsive capacities of plants. This research is manifested through a framework derived from specific biomimetic models; the pine cone hygromorph, and the hierarchical nature of plant materials. This framework is mapped against the fundamental components of a knitted fabric to establish a hierarchical model of knitting. Using this model a collection of knitted prototypes, constructed exclusively from natural fibres have been developed. These fabrics transform from 2D to 3D in response to changing moisture levels.

Whilst potential applications span the textiles sector, the impact of this research is more profound. This work represents a shift in thinking about responsive textiles. Rather than applying complex synthetics or e-textiles, my practice re-examines natural fibres and textile processes. Through the systematic application of a hierarchical model derived from biomimicry, a zero energy, 100% natural, responsive material system has been established.

Keywords: knitting, biomimicry, responsive material systems, smart textiles.

Scott | Mutate: Environmentally Responsive Knitted Textiles | © Scott 2014

Obscura 1C Digital Camera

James Pierce | Carnegie Mellon University | *pierjam@gmail.com*
Eric Paulos | University of California Berkeley | *paulos@berkeley.edu*

Blue Room | Day 1 | Late Morning session

Abstract: This document reproduces and further articulates an experimental electronic product and its packaging: The Obscura 1C Digital Camera. The Obscura 1C is part of a larger constellation of devices we have designed with the goal of exploring counterfunctionality. These devices present digital limitation as a positive design offering.

Keywords: interactive design, human-computer interaction, conceptual design, limitations.

Pierce et al. | *"The concrete enclosure is designed to inhibit access. Use care when attempting to break it apart."* | © 2014

Making Polychronic Objects

Jane Norris | Havering College | *drjanenorris@gmail.com*

Black Room | Day 1 | Late Morning session

Abstract: In the light of current debates on the future of making, the Polychronic Object research uses material experimentation to identify possible paradigm shifts. Through making, it maps new media aesthetics, contemporary theories of time and the practical implications of object orientated ontology. The research seeks to understand the implications of a potentially different making space opened up by a triangulation of concepts. Firstly, an aerial cultural viewpoint proposed by new visual theory; secondly, the conceptualisation of time through the act of mapping, crumpling and pleating of material history as an emergence practice; and thirdly, a practical translation of speculative realist approaches to materiality. The knowledge gained from these three positions aids navigation through the practical experience of making as mapping.

The polychronic bowls, as the material driver of the research, are an ongoing series of small bowls that combine materials from different historical eras. They are hand produced as one off experiments, intended to physically develop the ideas in the research facilitating tactile interaction with real objects.

This enquiry uses research-through-making. It emphasises learning through mapping potential material territories, as a dynamic description rather than a static definition. It offers designer-makers and consumers other possibilities, post mass manufacturing.

Keywords: polychronic, crumpling, time, mapping, materials, actants.

Norris | © 2014

Photo-parshiya: Discursive assemblages in an international women's centre

Rachel Clarke | Newcastle University | *rachel.clarke@ncl.ac.uk*
**Paul Dunphy** | Newcastle University | *paul.dunphy@ncl.ac.uk*
Peter Wright | Newcastle University | *p.c.wright@ncl.ac.uk*

Black Room | Day 1 | Late Morning session

Abstract: Research in community-based design highlights the importance of photo-sharing to support membership. As digital photographic collections both age and proliferate, the use of physical mementos and materials have been explored to support rich social interactions around photo-sharing within the home, museums, education and social care settings. However little attention has been paid to digital-material design for diverse cultural community heritage. We present the photo-parshiya; a digital photo-album, an artefact designed and used as part of a long-term research partnership with the Angelou Centre (www.angeloucentre.org.uk), an international women's centre in the UK. The purpose of the artefact was to initiate discussion on how technology might support creative exploration of heritage across cultures and generations. We describe how particular digital-material assemblages encouraged appreciation of archives to highlight the importance of material 'herstories' for confidence and play with technology while drawing attention to the challenges of sustaining community, familial continuity and relevance with young people when moving to the UK.

Keywords: photo-sharing, migration, heritage, materials, participation, diversity.
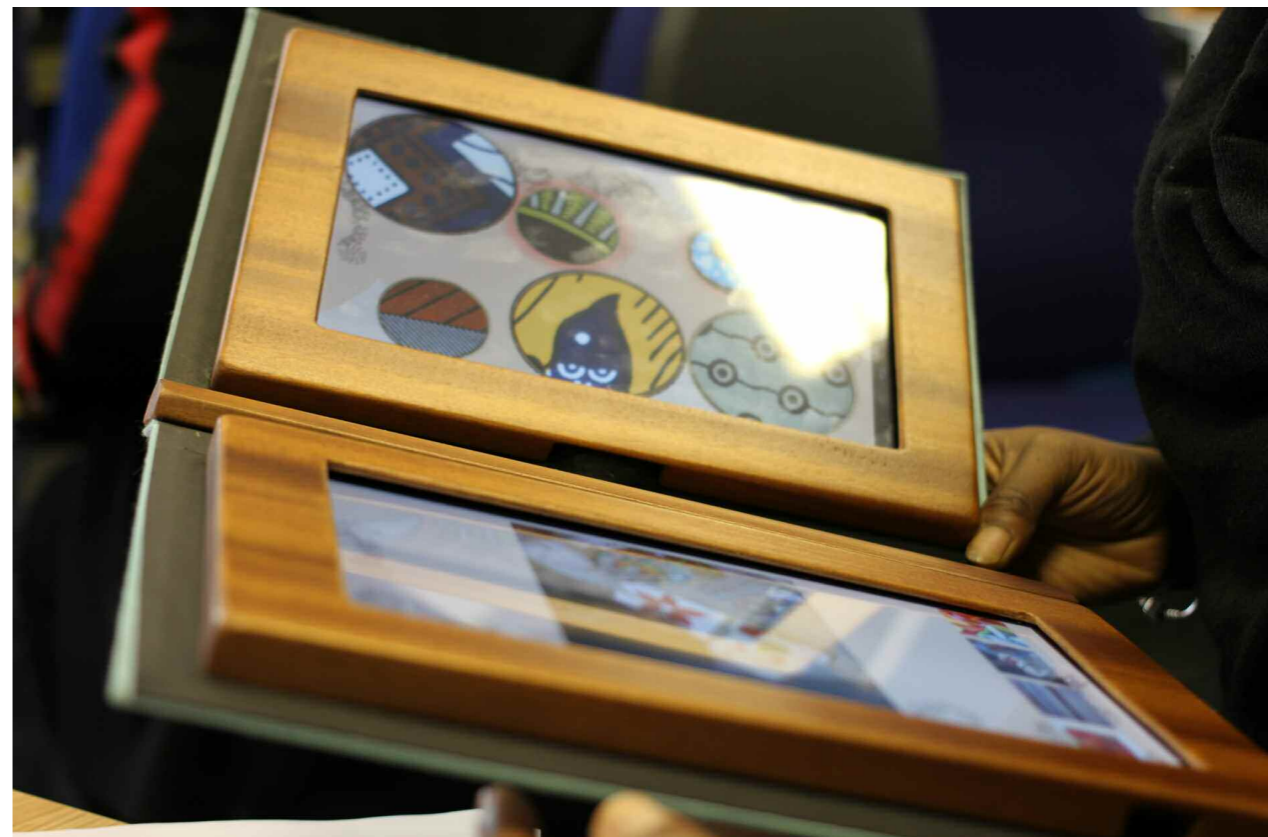
Clarke et al. | *Volunteer holding the photo-parshiya as part of the BAM! Sistahood heritage project (www.bamsistahoodproject.org.uk)* | © Lalya Gaye

HapticWave: Presenting the multiple voices, artefacts and materials of a design research project

Adam Parkinson | Goldsmiths, University of London | *a.d.parkinson@gmail.com*
David Cameron | Goldsmiths, University of London | *d.cameron@gold.ac.uk*
Atau Tanaka | Goldsmiths, University of London | *a.tanaka@gold.ac.uk*

Black Room | Day 1 | Late Morning session

Abstract: The HapticWave is a haptic audio waveform display device that has been developed in collaboration with a group of audio engineers and producers with visual impairments for use in real world recording studio environments. This was not a project led by a designer or driven by a design brief: rather, the genesis of the HapticWave emerged from exchange and interaction between actors who brought to the table different practices, experiences, expertise and needs. By presenting the voices involved in this practice based research project, we offer a comprehensive report to retrace step by step the development and deployment of a research prototype.

Keywords: NIME, haptics, accessibility, design workbook.

Parkinson et al. | *HapticWave, 2014* | *© David Cameron and Adam Parkinson*

Kindred Spirits: Smell fictions and performative design research

| **Susana Cámara Leret** | Thought Collider Studio | *info@thoughtcollider.nl*

Pink Room | Day 1 | Afternoon session

Abstract: This paper explores the associative power of smell as a performative design research medium, to trigger episodic memories of addiction patients from Mistral rehabilitation clinic, The Hague. It describes the use of smell as a speculative and storytelling device, leading to the design of the Smell-Memory Kit: The Molecules That Matter, to support memory recall and conversations evoked by particular smells.

The sensory research was used to discuss the impact of the physical space on the wellbeing of patients, leading to the co-creation of the Kindred Spirits species; design probes functioning as 'companion species', which allowed patients and staff to talk about underlying behaviours and motivations surrounding therapy, within the clinic's ecosystem.

In an interplay between the mundane and the fantastic, the project balances real needs with imagined desires, building on sensory experiences to encourage the contemplation of alternative perspectives to the promotion of long term behavioural change in addiction therapy.

Keywords: design fictions, performative research, smell memory, addiction care, experience.
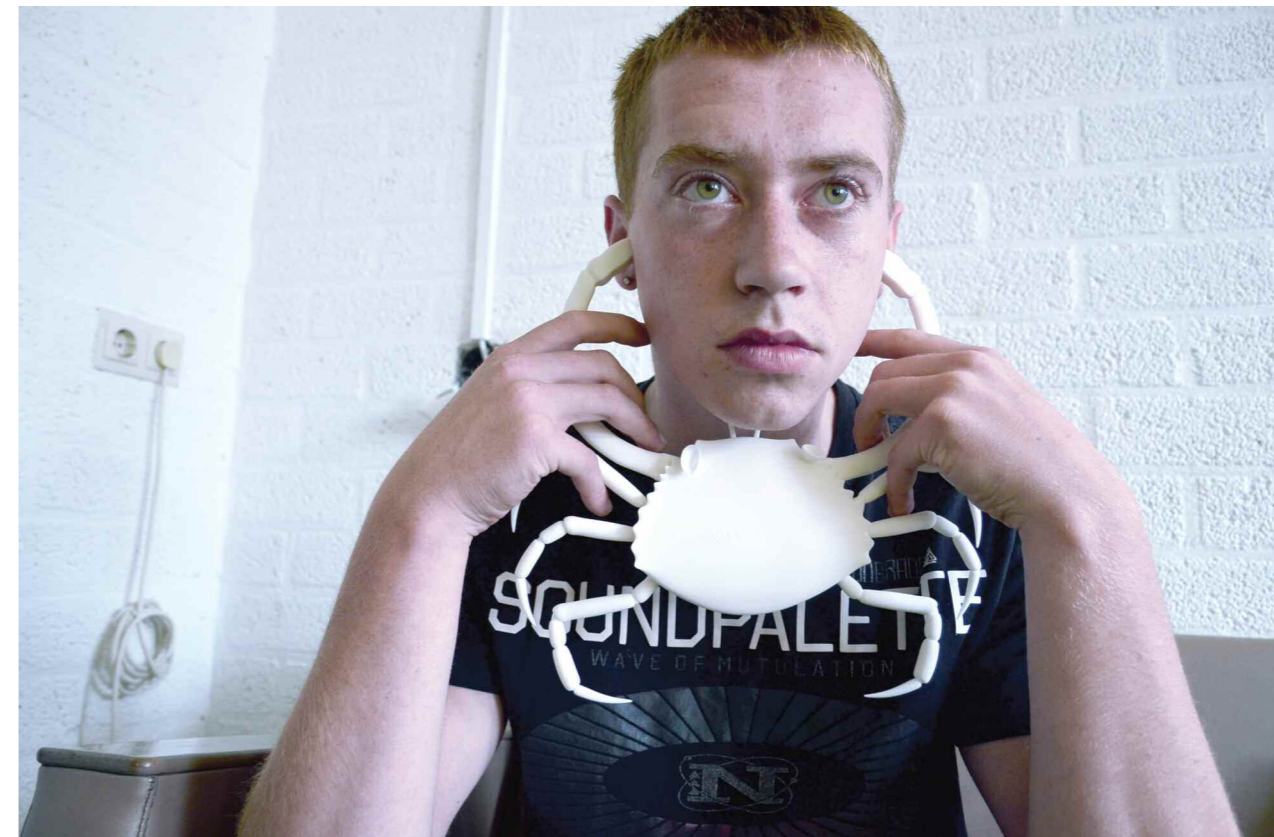
Leret | *© 2014*

Walking Off The Garden Path: A design journey

Liz Edwards | Lancaster University | *e.edwards3@lancaster.ac.uk*
Paul Coulton | Lancaster University | *p.coulton@lancaster.ac.uk*
Mike Chiasson | The University of British Columbia | *mike.chiasson@ubc.ca*

Pink Room | Day 1 | Afternoon session

Abstract: This paper illustrates various digital-nature artefacts, which emerged from a reflective design journey to enhance and support novel connections to nature in a garden.

The research imperative is to explore possibilities for the design of digital technologies for changing people's interpretation of a National Trust garden, encouraging encounters through the artefacts that take visitors off the garden path and reawaken them to the 'presence' of the garden. The process began with an exploration of the criticisms and possibilities of technologies suggested within the writings of Heidegger, Borgmann and Feenberg, which were complemented by insights from natural history writers such as Deakin. These writings guided the design sensibilities for the creation of a collection of interpretation artefacts including Audio Apples, Rhubaphones and a Nature Meditation Egg. Much of the work was situated in a Walled Kitchen Garden managed by the National Trust.

Research through design complements the research philosophy because it demands space for reflection and conversation, and enables inclusion of different voices within the design journey. The methodology has helped address the question of whether a design lens that begins with criticism of technology can change the way we design, and the artefacts produced.

Keywords: interpretation, design process, research through design, engagement with nature, values.

Edwards et al. | *© 2014*

Reflections on Designing for Aesthetic Engagement

Jeroen Peeters | Umeå University | *jeroen@tii.se*
Ambra Trotto | Umeå University | *ambra@tii.se*

Pink Room | Day 1 | Afternoon session

Abstract: Recently, there has been a clear shift in the Interaction Design community towards the design for engagement as opposed to more traditional ideals of efficiency and functionality. Our work explores how to design for aesthetic engagement in interaction; building on an approach founded on phenomenology, embodiment, pragmatist aesthetics and embodied cognition.

In this paper, we present four different research through design projects we have undertaken, in which we leveraged this approach. These designs cover a wide range of contexts, scales and use. Together, they describe and open up a design space: each of the projects provides rich, aesthetic experiences that respect complexity and ambiguity. They entice people to engage with body and mind, where meaning arises in dialogue with the artefact. We present and critically reflect on these projects in the form of an annotated portfolio. Comparing and contrasting the project results reveals insights into our overall approach and research interest regarding how to design for engagement. We conclude with opportunities that these reflections offer for the design of engaging interactions. Furthermore, we expand on the implications that these reflections suggest towards further trajectories of practice-based research into such experiences.

Keywords: interaction design, aesthetics, engagement, experience, reflection.

Peeters et al. | *DiffractMe! an interactive installation that was the result of a deep exploration to extract subtle physical qualities of experience from personal skills* | © 2014

Exploring interpretation as a creative strategy within type design

| **Caroline Powley** | Whitecliffe College of Arts & Design | *carolinepowley@gmail.com*

Blue Room | Day 1 | Afternoon session

Abstract: This paper describes an investigation into interpretation as an alternative approach for developing type design concepts. This practice-based project explored different interpretive strategies, with the intention of identifying a framework to provide structure to the initial stages of type design. It also aimed to create a set of interpretive type design processes that were generative and flexible.

The key interpretive strategy used was conceptual metaphor theory. Metaphors can aid understanding by structuring a complex process in terms of a simpler, often physical or spatial, experience. Two metaphors were used for linguistic translation to reframe and develop two interpretive type design processes, called Neighbourhood (transfer) and Build (assimilation). These were used to translate aspects of selected New Zealand suburban architecture into letterforms. The outcomes were communicated through two sets of artefacts, including process publications, prototypefaces and design guidelines. The processes were then extended into an introductory type design assignment for undergraduate students.

This paper reflects on whether interpretative processes can expand existing idea generation options for type designers and act as a learning tool. It also highlights the potential of conceptual metaphor theory as a framework for reviewing and developing design processes.

Keywords: type design, creative strategy, interpretation,translation, conceptual metaphor theory, graphic design education.

Powley | © 2014

Ways of Being Strands: Exploration of textile craft knots by hand and mathematics

Nithikul Nimkulrat | Estonian Academy of Arts | *nithikul.nimkulrat@artun.ee*
Janette Matthews | Loughborough University | *J.Matthews@lboro.ac.uk*

Blue Room | Day 1 | Afternoon session

Abstract: The paper presents an ongoing collaborative project between a textile practitioner-researcher and a textile practitioner-mathematician that investigates the relationship between mathematical knot theory and knotted textiles. It examines how multiple monochrome textile knots may be characterised using mathematical analysis and how this in turn may facilitate the conceptualisation, design and production of knotted textiles.

Mathematical investigation of Nimkulrat's knotted textile practice through the use of mathematical knot diagrams by Matthews revealed knot properties such as strand start/end positions and strand active/passive roles which were indiscernible from the work alone. This approach led to a way of visualising knot designs using more than one colour prior to making. Further iterative design experimentation and material properties led to the creation of a new striped pattern and a three-dimensional artefact which will be exhibited.

The result of this current research phase illuminates the role of mathematics in making the knotting process explicit. It demonstrates the influence of mathematical analysis on craft practice and the significance of cross-disciplinary collaboration on the development of knotted pattern design.

Keywords: craft, knot, knot diagram, knot theory, mathematics, textiles.

Nimkulrat et al. | *Details of Black & White Striped Armchair (2014), technique: hand knotting, material: paper string* | *© Nithikul Nimkulrat*

Engineering the Book: The relevance of material design to investigations of the picturebook, comic and graphic novel

Martin Salisbury | Cambridge School of Art, Anglia Ruskin University | *martin.salisbury@anglia.ac.uk*
Katherina Manolessou | University of Westminster | *kmanolessou@gmail.com*
Becky Palmer | Cambridge School of Art, Anglia Ruskin University | *becky.l.palmer@googlemail.com*
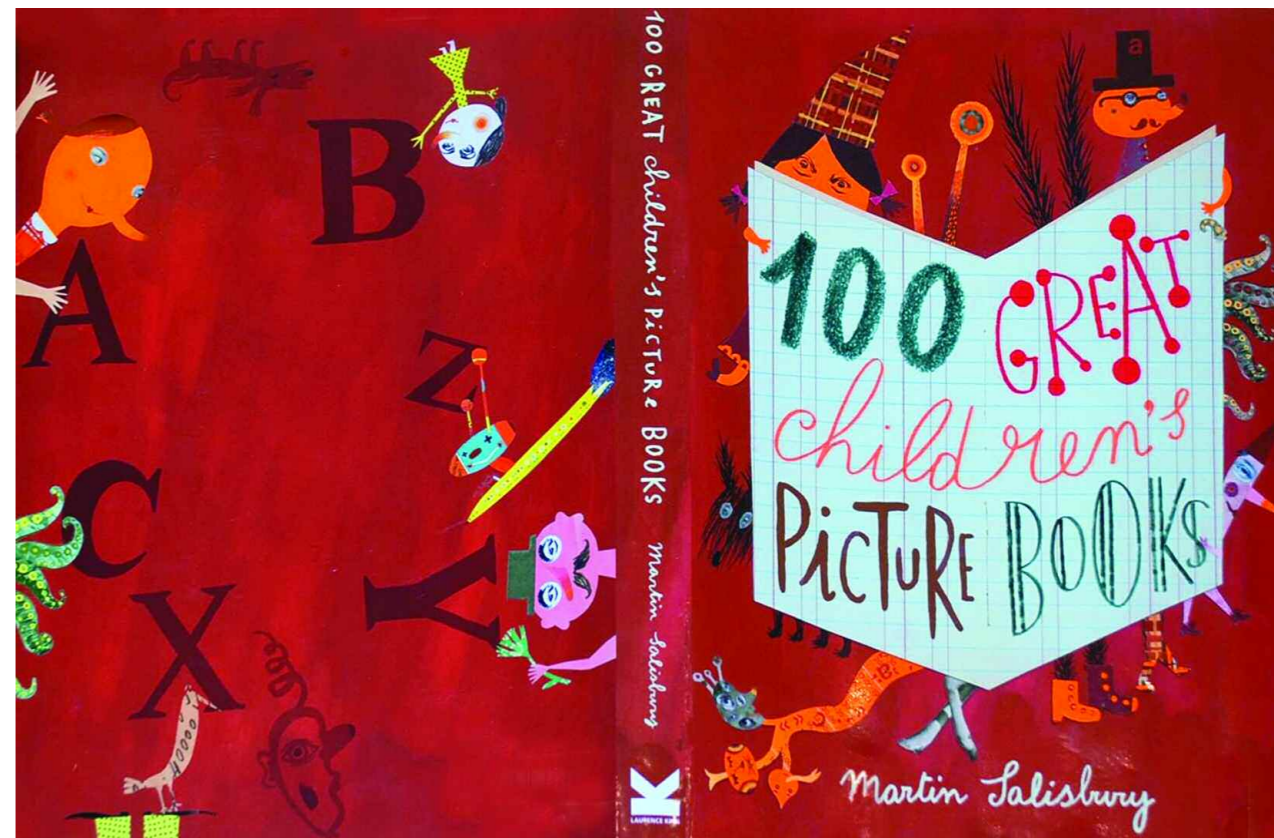
Blue Room | Day 1 | Afternoon session

Abstract: This 'project' is in the form of a three-way dialogue between three artist/designer academics whose work as practitioners and theorists aims to contribute to a greater understanding of the picturebook and its ever-evolving form, boundaries and status. Through practice-led PhD research, the three are all examining issues around the making of picturebooks. The Research Through Design forum is seen as particularly appropriate for this work, focusing as it does on the designing and making of what is primarily a visual communication form. Most research in the field of children's picturebooks has hitherto been from the field of children's literature studies.

Professor Martin Salisbury introduces the work of the three contributors, and describes through words and pictures the book which he has written on the subject of the picturebook, and the importance of its own physical form. Becky Palmer outlines and shows her practice-led research, exploring the boundaries between the picturebook and the graphic novel. Dr. Katherina Manolessou focuses on the dummy book as a tool for constructing the picturebook story.

Keywords: picturebook, book design, book Illustration, children's book illustration.

Salisbury et al. | © Sara Fanelli 2014

R.O.V. Digital Artwork as Narrative Controller

| **Guy Schofield** | Newcastle University | *g.p.schofield@ncl.ac.uk*

| Black Room | Day 1 | Afternoon session

Abstract: As we consume information about the world, we trust certain visual codes implicitly. From the distinctive fonts on road signs to the hard-edged forms of scientific equipment, these aesthetic memes work through association and reinforcement. A constant negotiation takes place: partly through consensus and partly through centralised systems of authority. These codes and the underlying truth which they purport to convey are mutable, shifting and temporary. The copperplate text of Darwin's journals now has an air of quaintness and naiveté: a feel of the arcane and the alchemical. For us the truth now comes through the sharpness of news footage: the coloured pipework of the Large Hadron Collider, the calm voiceover of a documentary film. R.O.V. is a narrative controller exploring the epistemology of exploration, discovery and cartography. Encased in a rugged hazard-yellow field box the piece appears to be a controller for a remote control submersible. Twin joysticks, switches and knobs allow the user to explore an underwater landscape, displayed on a monitor embedded in the field box. This environment, rendered in 3D graphics, is based on Kampanakis' 1891 map of Atlantis: itself an attempt to render credible a myth: a centuries-old string of Chinese whispers emanating from a chance remark in Plato. The piece represents both an attempt to use the aesthetic of an interface as a narrative device and to explore layers of truth, representation and misconception.

Keywords: narrative controller, narrative environment, structured engagement, materiality.

Schofield | *R.O.V.* | *© Guy Schofield*

Experiential Manufacturing: The earthquake shelf

Mark Selby | Edinburgh College of Art, University of Edinburgh | *mark.selby@ed.ac.uk*
David Kirk | Newcastle University | *david.kirk@ncl.ac.uk*

Black Room | Day 1 | Afternoon session

Abstract: Experiential Manufacturing describes a design led investigation into uncovering the latent values that might exist in data that describes our experiences. By learning from the ways we engage with meaning and memory through material encounters, it aims to create more intrinsic and aesthetic experiences of biographical data, and to provide meaning beyond the recall of information.

The earthquake shelf is a designed provocation that implements this approach. It monitors live data feeds for earthquakes at a specified location, and whenever one strikes, the shelf will shake. Depending on the earthquake's magnitude, the objects placed upon the shelf may fall, being damaged to leave behind material evidence of a remote event. This tangible rendition does not describe a person's previous earthquake experience, but by evoking it, seeks to allow for the reconstruction of memories, and for their association with 'new' objects through the action of the device.

This paper describes the design process behind the earthquake shelf, and reflects upon the experiences of the research participant. From strong visceral connection to the past, to empathetic connections to remote locations, and eventually frustration, the earthquake shelf revealed the ways that design might engender a variety of emotions and responses.

Keywords: design, memory, material, data.

Selby et al. | *The Earthquake Shelf* | *© Mark Selby*

Seeing the Light: Finding the poetic content of design objects

Anthony Forsyth | Northumbria University | *anthony.forsyth@northumbria.ac.uk*
Joyce Yee | Northumbria University | *joyce.yee@northumbria.ac.uk*
Trevor Duncan | Northumbria University | *trevor.duncan@northumbria.ac.uk*
James Thomas | Northumbria University | *james.e.thomas@northumbria.ac.uk*

Black Room | Day 1 | Afternoon session

Abstract: This paper presents the process and initial results of a research through design project attempting to understand the poetic qualities of design objects. This exploration forms part of a PhD study addressing design artefacts as poetic objects – objects that both embed and conjure memory, association and imagination. The research examines the ways in which design objects can be poetic and how designers actively and knowingly use objects to poetic effect.

It is proposed that the poetic content of design artefacts can be located on a continuum ranging from the experiential – relating to how we perceive things – to the reflective and cultural. What unites these levels is the capacity of design objects to reveal and change our way of looking at things.

The practice uses the design of lighting as a vehicle for exploring the poetic meaning of designed objects more generally. Starting with the notion that lights do more than provide light, the current phase of practice examines the ways in which luminaires can mediate how we perceive and experience light and explores, in particular, the more nuanced and ephemeral qualities of light that escapes conscious attention.

Keywords: light, poetic, phenomenology, ephemarility.

Forsyth et al. | *© 2014*

Provocation Panel
### With John Bowers, Bill Gaver and Jonas Löwgren
Moderated by Carl di Salvo

Main Auditorium | Day 1 | Late Afternoon session

RtD Question Time: We have decided to take the somewhat risky move for this provocation of modelling it on Question Time, a current affairs programme in the UK in which a panel of politicians and other pundits discuss questions submitted in advance by audience members. Thus we invite conference participants to submit their questions about the practice of research through design (RtD) to our three moderately-qualified 'experts'. The questions we receive will be vetted for the best and most challenging, but the panel members will not see them in advance.

Go ahead, ask the big questions you've always wanted to ask: How does RtD relate to commercial practice? What are the best ways to disseminate RtD? Are blue LEDs really that cool? And what makes you three think you're even 'moderately qualified' to do this anyway?

Questions can be submitted via the registration desk, or directly to our massively-qualified moderator Carl DiSalvo. Join in, and make this a provocation for audience and panellists alike!
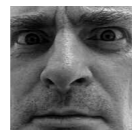
John Bowers is an artist-researcher working within Culture Lab, Newcastle University, with a particular interest in the use of art and design-led methods to explore digital technologies and novel interaction concepts. He also works as a sound artist improvising with electronic, digital, acoustic and electro-mechanical devices and self-made instruments in performance and installation settings. His work is often grounded in field research methods drawn from the social sciences and related to theoretical and practical issues in Human Computer Interaction, design research, material culture, media archeology and critical theory.

Bill Gaver is Professor of Design and co-leader of the Interaction Research Studio at Goldsmiths, University of London. He pursues practice-based research on technologies for everyday life in a studio that brings the skills of designers together with expertise in ubiquitous computing and sociology. With the Studio, he has developed approaches to design ranging from Cultural Probes to the use of documentary film to help assess peoples' experience with designs, pursued conceptual work on topics such as ambiguity and interpretation, and produced highly-finished prototypes that have been deployed for long-term field trials and exhibited internationally at venues such as the V&A Museum, Tate Britain, and New York's MOMA.

Jonas Löwgren is professor of interaction design and co-founder at the School of Arts and Communication (K3), Malmö University, Sweden. He specialises in collaborative media design, interactive visualisation and the design theory of the digital materials. Jonas has taught interaction design in university courses and in companies since the early 1990s and initiated the influential two-year master's program and the PhD program in interaction design at Malmö University. He has published some 60 peer-reviewed academic papers and four books, including Thoughtful Interaction Design (with Erik Stolterman, published by MIT Press), and a vast range of general-interest and pedagogical material.

Carl DiSalvo is an Associate Professor in the School of Literature, Media, and Communication at the Georgia Institute of Technology. At Georgia Tech he directs the Public Design Workshop: a design research studio exploring socially-engaged design and civic media. He is also the co-director of the Intel Science and Technology Center for Social Computing. His first book, Adversarial Design, was published MIT Press in 2012. DiSalvo's experimental design work has been exhibited and supported by the ZKM, Times Square Arts Alliance, Science Gallery Dublin, and the Walker Arts Center. DiSalvo holds a Ph.D. in Design from Carnegie Mellon University.

08:00–09:30	Registration
09:30–10:15	**Plenary Session: Main Auditorium**
	Documentation of Day 1
10:15–10:45	Morning Break
10:45–12:25	**In the Exhibition Space and beyond**
	Making Space
12:25–14:00	Lunch Break
14:00–15:40	**Rooms of Interest: Pink Room** / **Rooms of Interest: Blue Room** / **Rooms of Interest: Black Room**
	Digital Civics / **Experiencing Data** / **Hybridity**
15:40–16:10	Afternoon Break
16:10–17:10	**Plenary Session: Main Auditorium**
	Provocation on Making, and Making a Difference: David Gauntlett & Amy Twigger Holroyd
17:10–18:00	Evening Break
18:00–18:30	Coaches to Jesus College
18:30–19:30	Drinks Reception in Prioress's Room & Cloisters
19:30–	Conference Dinner

ROI: Pink Room
14:00–15:40
Digital Civics

Chris Csíkszentmihályi *et al.* | RootIO: Platform design for civic media
Carl DiSalvo *et al.* | Drones for Foraging
Nick Gant *et al.* | Encouraging 'Young Digital Citizenship' Through Co-designed, Hybrid Digi-tools

ROI: Blue Room
14:00–15:40
Experiencing Data

Shruti Grover *et al.* | Certainty as a Provocation: The design and analysis of two quant-qual tool dyads for a qualified self technology project
Sarah Pennington *et al.* | Data Tourism
David Sweeney *et al.* | A Pixel is Not a Pixel: Simple data charting made physical

ROI: Black Room
14:00–15:40
Hybridity

Jonas Löwgren | Beyond Conversation: Palpating the hybrid materials
Kristina Andersen *et al.* | The Instrument as the Source of New in New Music
Anna Katrine Hougaard | Architectural Drawing as Premise for PhD project

Making Space

At the heart of the RTD conference experience is rich discussion around the exhibited artefacts. Alongside the Rooms of Interest that offer a round-table format for the presentation of work, we have made space in the programme for alternative presentations in and beyond the exhibition space that may be considered particularly fitting. For example, we are aware that some of the exhibited works may benefit from being demonstrated ,or performed outside, or from being engaged with on a more intimate basis.

The Making Space session has an open and flexible schedule to accommodate different forms of engagement with the work. During this session, we ask that presenters spend time engaging with delegates about their work and provide new opportunities for interaction with it as they see fit.

Please check at the main registration desk in advance of this session for specific details about presentations. This is because some presenters are planning performances or demonstrations of their work outside of the conference venue and may require delegates to sign up for such 'trips'; other presenters may perform their work for short periods during the session. Our hope is that the session creates additional opportunities for all attendees to experience the exhibited work in ways that feel meaningful and fitting.
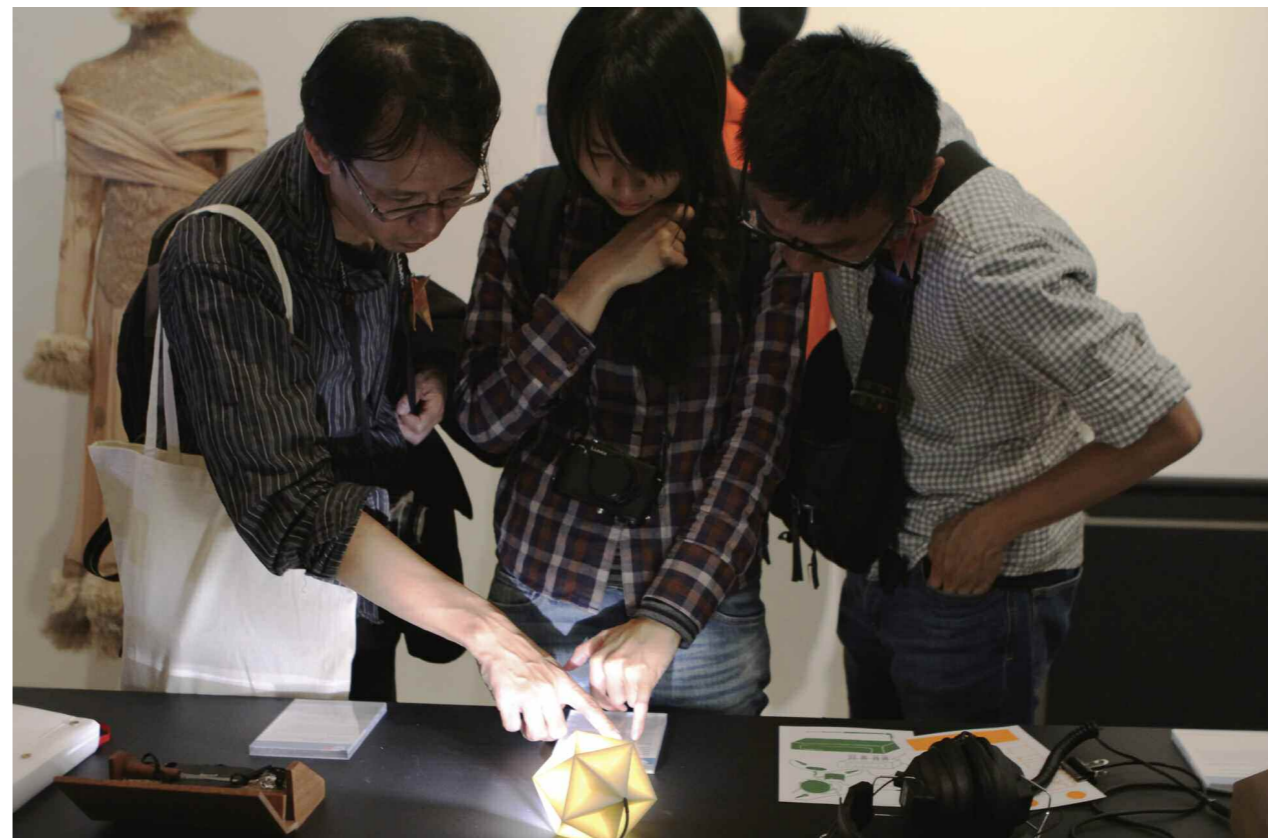
Praxis + Poetics: Research through Design (2013) | *© Matthew Coombes*

RootIO: Platform design for civic media

Chris Csíkszentmihályi | Madeira Interactive Technologies Institute | *robotic@gmail.com*
Jude Mukundane | RootIO.org | *jude.mukundane@gmail.com*

Pink Room | Day 2 | Afternoon session

Abstract: RootIO is a civic media platform and research project in the context of rural farming communities in Uganda. The RootIO project draws from prior work in civic media, the design of public goods and information services for communities rather than individuals. This project presents the additional challenge of designing a participatory community information platform in a relatively low literacy, low income area with little access to ICTs. Unlike many 'development' projects, it focuses on local peer production rather than top-down 'behavior change' messaging.

RootIO is in active development and prototype FM stations will go on air in 2015: we will present a prospective exploration and report of current and future work. RootIO is being developed with an open-ended and iterative method, where use and failure can be tracked and analysed in real-time.

We begin the paper by defining the context and background of the RootIO project, then present our research goals in building the system. We then discuss some of the methodological techniques that inform our design, including civic media and platform design. Finally, we will introduce the RootIO project. Our submission to the exhibition is a functioning FM 'microstation' design of the sort deployed in rural Uganda.

Keywords: civic media, platform design, community media, radio, participation.
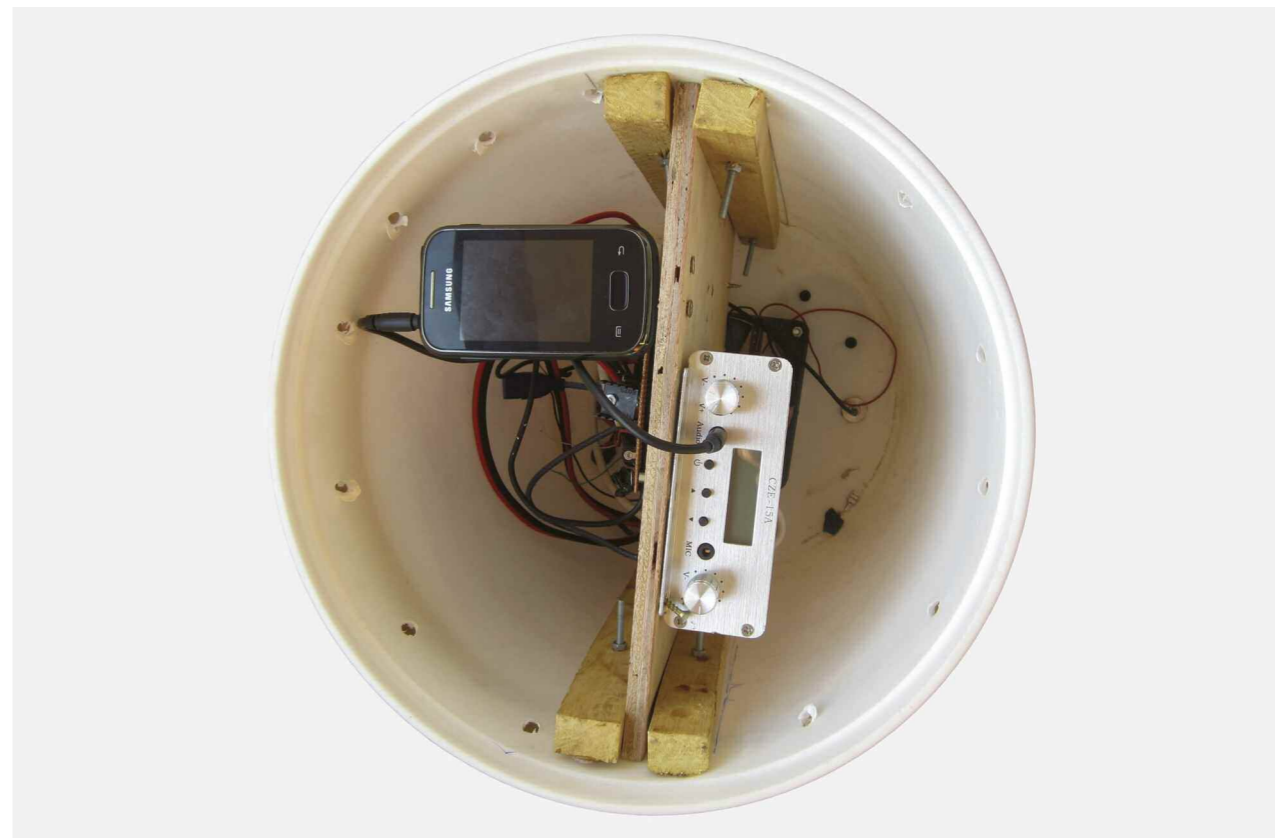
Csíkszentmihályi et al. | A RootIO 'microstation' built from locally sourced materials | © RootIO Project

Drones for Foraging

Carl DiSalvo | Georgia Institute of Technology | *cdisalvo@gatech.edu*
Tom Jenkins | Georgia Institute of Technology | *tom.jenkins@gatech.edu*

Pink Room | Day 2 | Afternoon session

Abstract: Drones for Foraging is a research through design project that explores the use of hobbyist drones in support of urban foraging. The underlying motivation for this project is to use design as a means of investigating future practices and to provide the basis for near-term innovation with hobbyist drones.

Through this project we are developing use-cases that make strong claims around the current and future uses of drone technologies to aid bottom-up food finding, prototyping software and user interfaces for drone navigation, helping build a broader community of practice around these complex issues, and exploring the use of open-source technologies for image capture and analysis.

Our work is intended to provide real-world rationales that move drones beyond being military hardware or simply a technological gizmo. Repurposing automation and monitoring technologies as partners in food-finding proposes a collaboration between the ecological, technical, and social that illustrates one way to generate new food infrastructures.

Keywords: design, drones, agriculture, foraging.

DiSalvo et al. | © 2014

Encouraging 'Young Digital Citizenship' Through Co-designed, Hybrid Digi-tools

Nick Gant | University of Brighton | n.a.gant@brighton.ac.uk
Kelly Duggan | University of Brighton | K.Duggan1@uni.brighton.ac.uk
Tanya Dean | University of Brighton | td57@brighton.ac.uk
Josh Barnes | University of Brighton | j.barnes2@brighton.ac.uk

Pink Room | Day 2 | Afternoon session

Abstract: This paper presents findings of a case study, co-design and constructive design research project which explores hybrid digital / physical methods and tools to engage young people in the design and planning of their neighbourhood. This sits within the context of radical changes in the National Planning Policy Framework (NPPF 2011) and Localism Bill (DCLG 2011), which demand new levels of democratic participation in local decision-making and the collaborative design of place.

It also tends to issues and theories of how communities (civic and academic) consider the use of digital / physical objects and processes in helping to cure the disengagement of youth in the local politic and developmental decision-making.

The project explores the co-designing and making of hybrid digital / physical engagement and communication devices resulting in a 'community techno-tapestry'. The case study demonstrates the communication value of physical digi-tools when seeking to both engage young people in envisioning their future neighbourhood and in mediating their 'shared vision' to the community and stakeholders.

This research was funded by The Nominet Trust (2013-2014) .

Keywords: community, envisioning, technology, co-design, participatory design.

Gant et al. | © 2014

Certainty as a Provocation: The design and analysis of two quant-qual tool dyads for a qualified self technology project

Shruti Grover | The Helen Hamlyn Centre for Design, Royal College of Art | *shruti.grover@network.rca.ac.uk*
Ross Atkin | The Helen Hamlyn Centre for Design, Royal College of Art | *ross.atkin@network.rca.ac.uk*
Chris McGinley | The Helen Hamlyn Centre for Design, Royal College of Art | *chris.mcginley@network.rca.ac.uk*

Blue Room | Day 2 | Afternoon session

Abstract: This paper takes its starting point in recognising that the 'quantified self movement' can go beyond its existing purely quantitative nature and develop a second degree of meaning, so that the individual achieves self knowledge through human insights.

We designed a research methodology to explore an individual's current and past relationship with 'activity levels' and 'balance health' using two quant-qual dyads. For the first dyad, quantitative data was gathered about the number of steps taken by participants, and compared to the qual tool of energy diaries. For the second dyad, quantitative data about postural sway was gathered through an application and qualitative data about the perceptions of balance was gathered through a personal diary. Quantitative data provided grounds for sensitising the participants to the idea of 'balance health' and 'activity levels' and the qual tools revealed the lack of an actionable vocabulary on the one hand for 'balance health' and rich narratives for 'activity levels' on the other. Therefore, there exists an opportunity for research through design to understand an individuals perception of their activity and to compare this existing self knowledge (or the lack of) to factual quantitative data in order to design qualified self technology devices.

Keywords: ways of knowing, human centred design, quantified self, qualitative visualisations, technology, cultural probes.
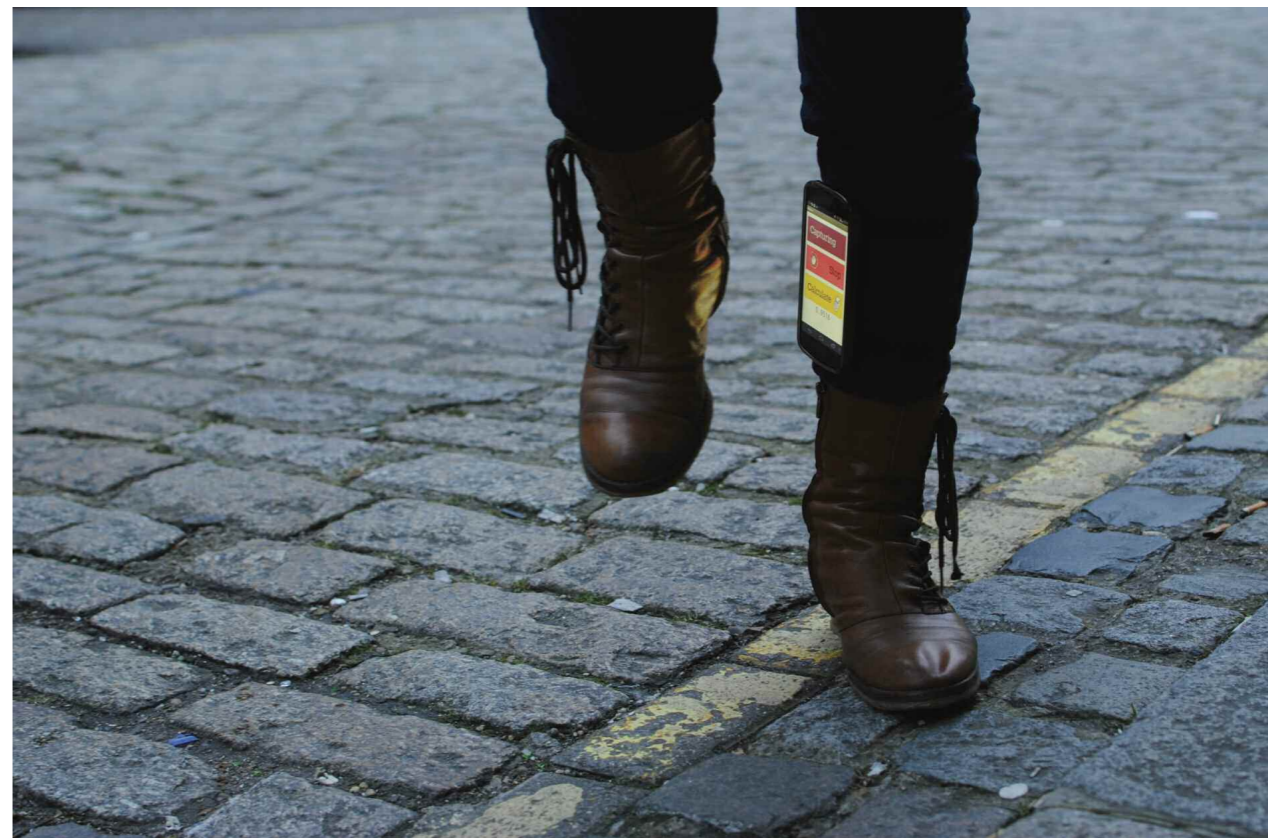
Grover et al. | *Prototype application for postural sway analysis* | © Ross Atkin

Data Tourism

Sarah Pennington | Goldsmiths, University of London | *sarahpennington@mac.com*
Nadine Jarvis | Goldsmiths, University of London | *n.jarvis@gold.ac.uk*
David Cameron | Goldsmiths, University of London | *d.cameron@gold.ac.uk*
**Andy Boucher** | Goldsmiths, University of London | *a.boucher@gold.ac.uk*
William Gaver | Goldsmiths, University of London | *w.gaver@gold.ac.uk*

■ Blue Room | Day 2 | Afternoon session

Abstract: We invite the visitors to RTD 2015 to come on a walking tour with us. Our 'tourists' will be given a recent research device developed by our studio, and asked to try it out together. The 'artefact' at stake here is not the device, but the walking tour itself. We suggest that, by trying our devices live and in situ, the tour will supplement other means of dissemination such as publications or exhibitions. This will both allow participants to better understand our field trial methodology, and to experience for themselves a design they might otherwise only encounter in a conference presentation, article, or exhibition.

Keywords: dissemination practices, field trials, designing deployment, location based data, ludic design.
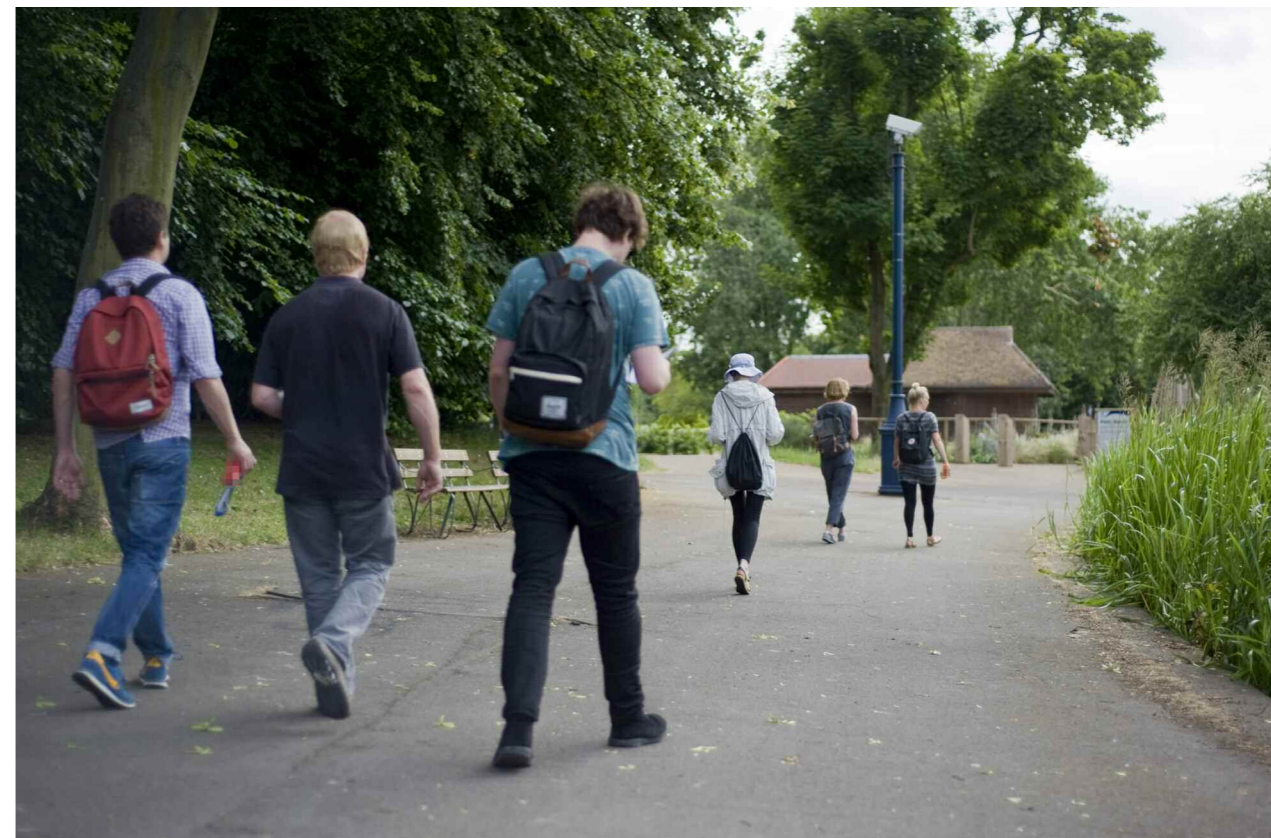
Pennington et al. | *A device-centred walking tour, London 2014* | *© Interaction Research Studio*

A Pixel is Not a Pixel: Simple data charting made physical

David Sweeney | Microsoft Research | *dsweeney@microsoft.com*
Tim Regan | Microsoft Research | *timregan@microsoft.com*
Alex Taylor | Microsoft Research | *alex.taylor@microsoft.com*
**Siân Lindley** | Microsoft Research | *sianl@microsoft.com*

Blue Room | Day 2 | Afternoon session

Abstract: The humble pie chart, the basic line graph: we are used to these and other forms of basic graphs. These have become commonplace and they can blend into the background, another plot on the screen real estate that accompanies our lives. To stand out, screen based data visualisations have become ever more beautiful, intricate and bespoke, but in so doing their legibility can suffer.

In a project on community data, run in collaboration with residents of Tenison Road in Cambridge, we have been exploring how to present data to the community that will be accessible to as many local people as possible. We chose to use our highly visible window-frontage, visible from Tenison Road itself. As a technology company, our street facing window is full of screens, which could easily have been used for our purposes. Instead we have designed and built physical visualisations of a pie chart and a line graph. These are simple in the sense that they are easy to read and make playful use of some readily available material (like retractable tape measures). Their design is sensitive to the need for readability and spectacle.

Keywords: data visualisation, charts, physical charts, physical displays.
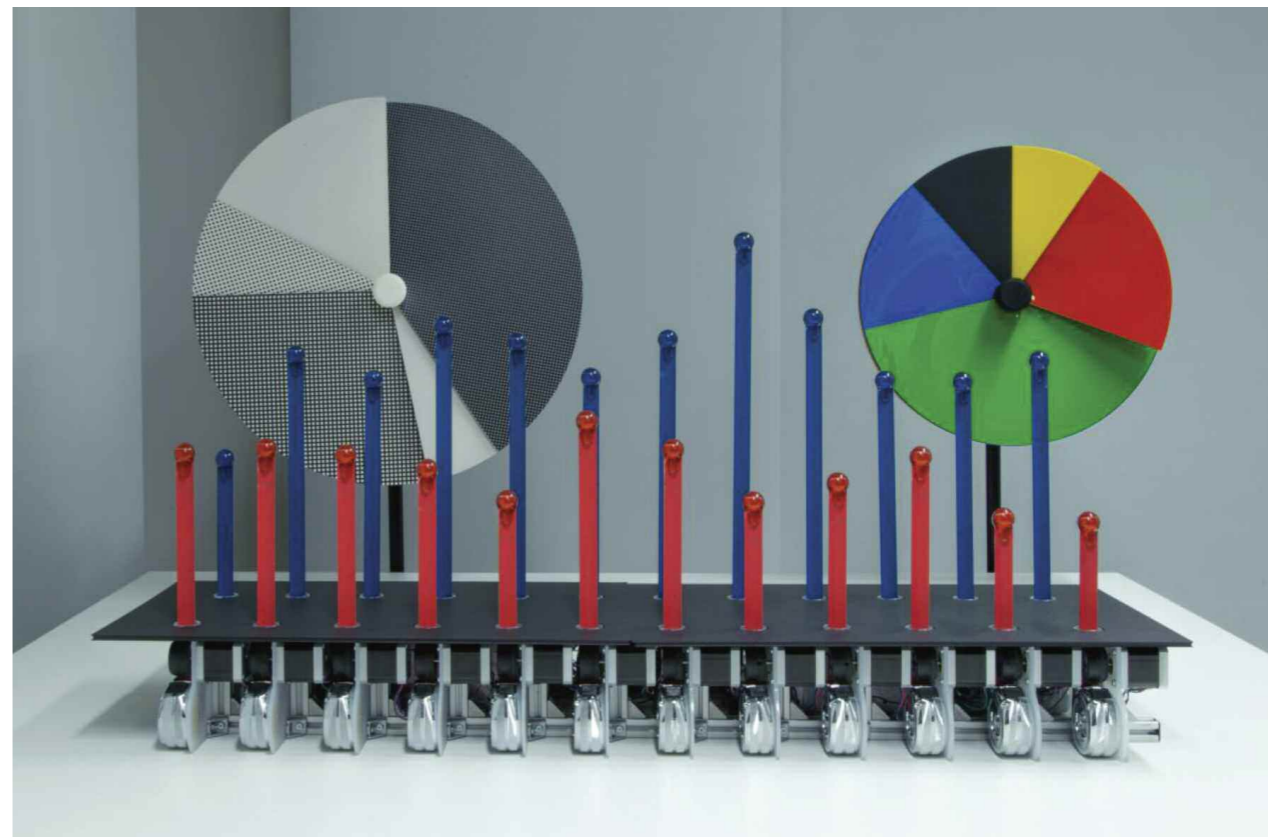
Sweeney et al. | *The Three Physical Charts: Two Pie Charts and the Bar Graph* | *© Microsoft Research*

Beyond Conversation: Palpating the hybrid materials

| **Jonas Löwgren** | Malmö University | *jonas.lowgren@mah.se*

Black Room | Day 2 | Afternoon session

Abstract: Based on an episode from a design case, it is argued that explorative interaction design with hybrid materials combining physical and digital properties is better conceptualised as palpating the hybrid materials, rather than having a conversation with them. This leads to a proposed design strategy for designers working with hybrid materials: to build prototypes and do material experiments in a way that foregrounds immediate sensate feedback and externalises responses that are normally not perceivable.

Keywords: design of tangible interaction, hybrid design materials, design strategy.
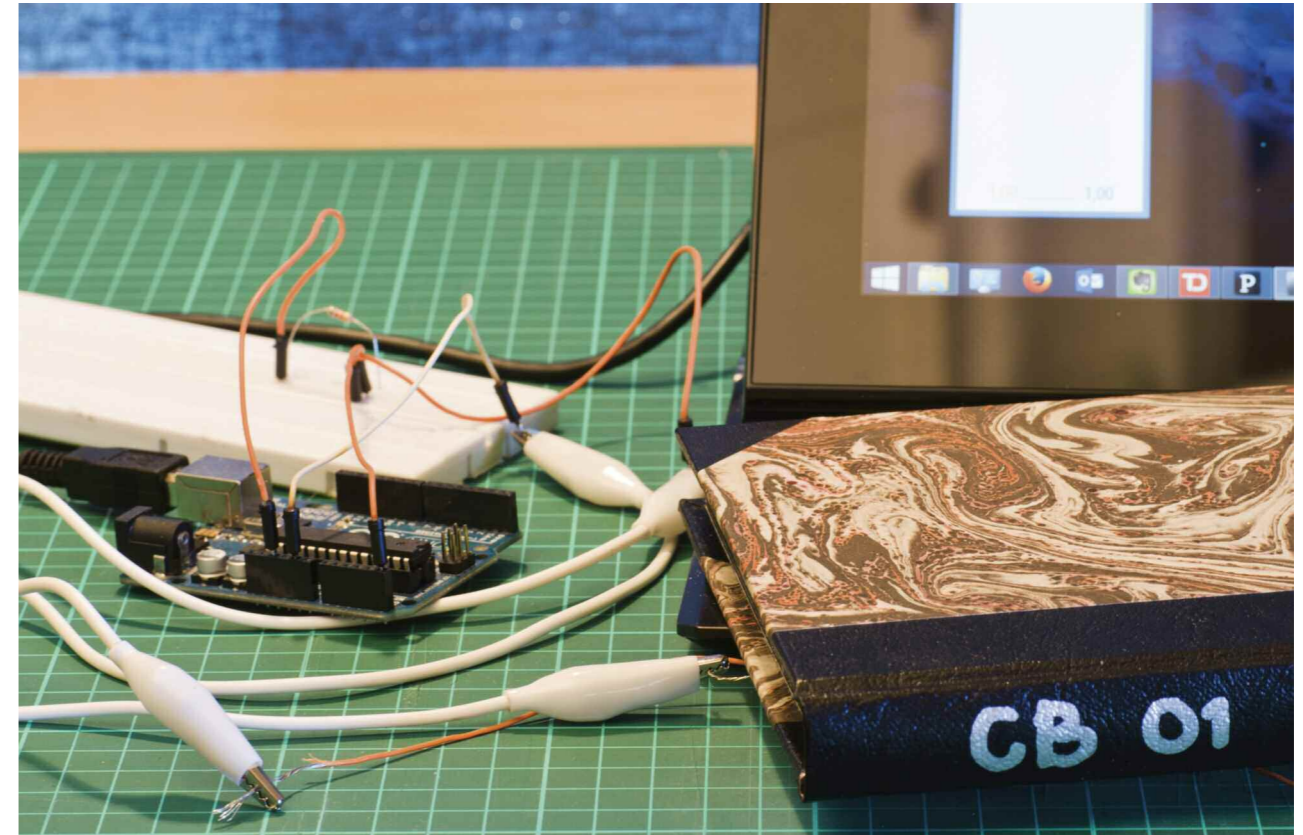
Löwgren | *© 2014*

The Instrument as the Source of New in New Music

**Kristina Andersen** | STEIM (the STudio for Electro-Instrumental Music) | *kristina@tinything.com*
Dan Gibson | STEIM (the STudio for Electro-Instrumental Music) | *dangibson30@hotmail.com*

■ Black Room | Day 2 | Afternoon session

Abstract: Like any traditional instrument, the potential of a new instrument and its possible music can only be revealed through playing. How can we treat technological matter as yet another material from which our notions of possible future instruments can be constructed, intrinsically intertwined with and informed by a practise of performance? Our approach to developing instruments for musical performance strives to not just make technology, but aesthetic and cultural objects. A musical instrument is not an interface and should not be designed as such, instead, instruments are the source of new in new music. We would like to present an instrument design process conducted with a musician as visionary and agenda setter. As the instrument grows and evolves through the various stages, it remains playable and faithful to the desire to make music. The resulting objects are experimental prototypes of technological matter, which allow analysis and meaning to be specified through physical and tactile interaction with the object itself. At RTD2015 we will present a range of these intermediate prototypes and play the finished instrument.

Keywords: instrument, embodied, making, improvisation, performance, prototype.
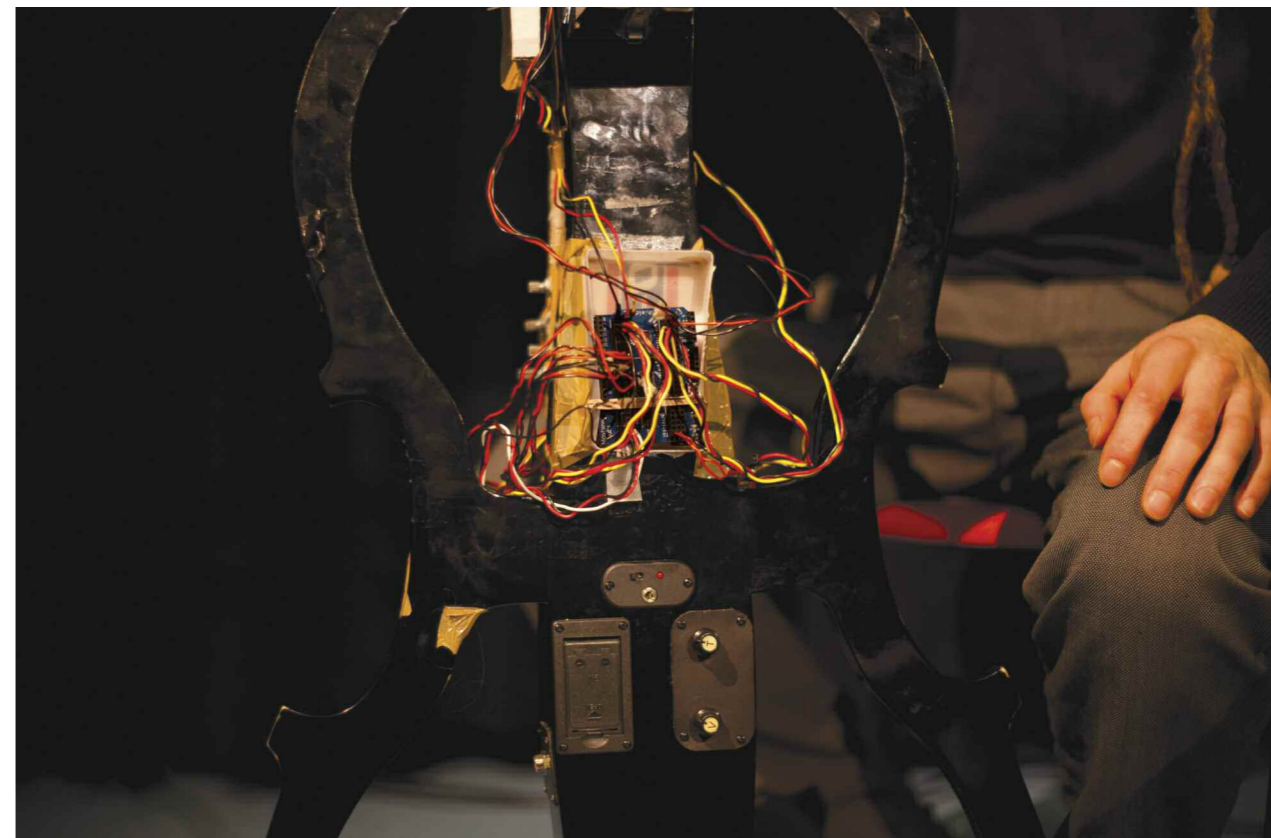
Andersen et al. | Re-making the cello | © Dan Buzzo

Architectural Drawing as Premise for PhD project

| **Anna Katrine Hougaard** | Royal Danish Academy of Fine Arts | *anna.hougaard@kadk.dk*

Black Room | Day 2 | Afternoon session

Abstract: My ongoing PhD is about architectural drawing, and I use drawing as a way to drive and shape the project, not unlike the way I used drawing when studing as an architect. I try to see drawing and theory as practices that inflict upon and develop each other equally rather than as one practice subjugating the other.

This method resonates with how I think architectural drawing works; how it becomes productive in a design process. Both a research process and a drawing process are epistemic environments in the way that they are used to produce something new, new knowledge or new drawing. There are important differences however. For instance, drawing can take place where the aim of the process is not necessarily defined in advance, whilst a research process requires aims that are open yet predetermined. The theory-based outcomes of my research are the construction of terms and arguments, which are different from the construction of a drawing.

Here I present my PhD project where architectural drawing, especially orthogonal drawing, is approached as a collection of double conditions, such as: analogue and digital notation; the hand and the computer; projections and notations; figures and scores; icons and codes; indeterminacy and determination. To see drawing as a double condition is a way to show how opposing trajectories can co-exist and yet be productive for each other.

Keywords: Double conditions: drawing/theory, sketch/diagram.
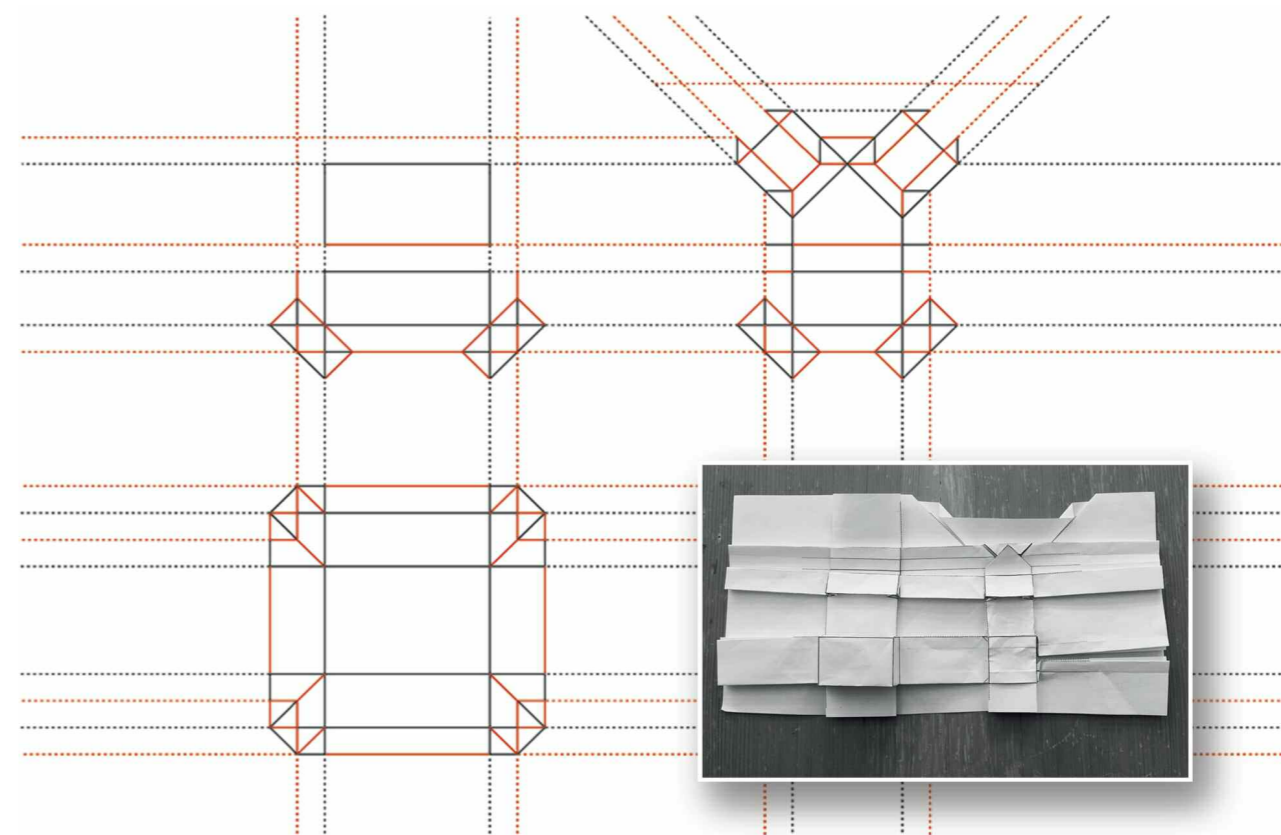
Hougaard | Orthogonal drawing layout as origami folding | © 2014

Provocation on Making, and Making a Difference:
David Gauntlett and Amy Twigger Holroyd

Main Auditorium | Day 2 | Late Afternoon session

David Gauntlett is a Professor in the Faculty of Media, Arts and Design, and Co-Director of the Communications and Media Research Institute, at the University of Westminster, UK. His teaching and research is about self-initiated everyday creativity, and cultures of making and exchanging. He is the author of several books, including Creative Explorations (2007), Making is Connecting (2011), and Making Media Studies (2015). He has worked with a number of the world's leading creative organisations, including the BBC, the British Library, and Tate. For almost a decade he has worked with LEGO on innovation in creativity, play and learning.

Amy Twigger Holroyd is a designer, maker, writer and researcher. Through her knitwear label, Keep & Share, she has explored the emerging field of fashion and sustainability since 2004. Her work has been featured in many books and publications, from Vogue to Fashion Theory. In 2013 Amy completed her PhD at Birmingham Institute of Art & Design, investigating amateur fashion making – which she describes as 'folk fashion' – as a strategy for sustainability. Amy is now a Research Fellow in the School of Design at the University of Leeds, working on a three-year AHRC-funded project, Design Routes.

Notes:

Day 3: Day schedule and Rooms of Interest presentations

Time	Session		
08:00–09:30	Registration		
09:30–10:15	**Plenary Session: Main Auditorium** **Documentation of Day 2**		
10:15–10:45	Morning Break		
10:45–12:45	**Pink Room** **RTD Town Hall Meeting**	**Rooms of Interest: Blue Room** **Speculation in the Field**	**Rooms of Interest: Black Room** **Materialising Futures**
12:45–14:00	Lunch Break		
14:00–15:40	**Plenary Session: Main Auditorium** **Closing Provocation: Sir Christopher Frayling**		
15:40	Conference Close		

ROI: Blue Room 10:45–12:25 Speculation in the Field

Cally Gatehouse | Free as in Wifi, Public as in Network: A practice based investigation of networked public space

Lorenzo Davoli et al. | Trojans & Drones: Materializing possibilities for transforming industrial infrastructures

Mel Woods et al. | The Blue Plaque: Co-creating design fictions in the wild

ROI: Black Room 10:45–12:45 Materialising Futures

Guido Hermans | Investigating Lay Design through Prototyping a Toolkit for Audio Equipment

Bernard Guy et al. | Synthetic Anatomies: Co-designing desirable 3D printed facial prosthetics

Amy Twigger Holroyd | Re-knitting: Exploring openness through design

Ruby Hoette | Col-lec-tion

RTD Town Hall Meeting
Hosted by Abigail Durrant, John Vines, Jayne Wallace and Joyce Yee

Pink Room | Day 3 | Late Morning session

This session will be hosted by the Conference Chairs and Steering Committee, and is intended to provide an opportunity for interested RTD community members (that's anyone who is at the conference!) to participate in an informal discussion around the aims and ethos of the burgeoning conference series.

We have already penned a number of questions we would like to explore with community members, particularly around the publication options for the conference events looking forward, and the challenges associated with leveraging visual argumentation and the communication of practice-based research in traditional publishing formats.

If you are unable to come to the Town Hall meeting – perhaps because you can only attend the first two days of the conference, or because you would like to attend Rooms of Interest taking place in parallel – you will still be able to pose questions for discussion. Just mention these to the chairs or SVs during the conference. Alternatively, if you'd like to do this anonymously, complete one of the postcards in your delegate pack and pop it in the Comments Box on the registration desk.

We are interested in capturing constructive comments and questions around the burgeoning conference series – including the role of peer-review, the process of peer-review itself, the formats for dissemination at the conference and beyond (e.g. relating to exhibitions, Rooms of Interest, plenaries, documentation, and the venue).

Praxis + Poetics: Research through Design (2013) | © Matthew Coombes

Free as in Wifi, Public as in Network: A practice based investigation of networked public space

| **Cally Gatehouse** | Northumbria University | *cally.gatehouse@northumbria.ac.uk*

Blue Room | Day 3 | Late Morning session

Abstract: The aim of this research is to ask what 'free' and 'public' mean in the context of wireless networks. Is it free as in beer? Or free as in speech? Should it be 'free at the point of access'? Or is it free because we are the product? This practice-based research aims to investigate people's understanding of free wifi and also looks critically at the design aspects of wifi interface through the design of a cultural probe in the form of a 'captive portal'. Presenting the project as a work in progress, this paper outlines the insights gained through the design process and also points towards the potential contribution of participatory design methods such as cultural probes to critical design practices.

Keywords: critical design, cultural probes, public space, wireless networks.

THERE IS NO SUCH THING AS FREE WIFI

Gatehouse | © 2014

Trojans & Drones: Materialising possibilities for transforming industrial infrastructures

Lorenzo Davoli | Umeå Institute of Design, Umeå University | *lorenzo.davoli@dh.umu.se*
Heather Wiltse | Umeå Institute of Design, Umeå University | *heather.wiltse@dh.umu.se*
Johan Redström | Umeå Institute of Design, Umeå University | *johan.redström@dh.umu.se*

Blue Room | Day 3 | Late Morning session

Abstract: Emerging post-industrial societal needs require the evolution of existing networks of industrial infrastructures toward more distributed and citizen-centered configurations. This opens up new questions regarding what design processes and practices are necessary to effect change within these systems that are often deliberately not accessible or open for design interventions. We present a set of design explorations in tracing and materialising infrastructures in order to make them available for design and participation, taking logistic services in a remote rural area of northern Sweden as a case study and field site. A design concept consisting of a drone and drone postbox were used to speculate about the possibility of a community-owned delivery network operated by drones in synergy with existing infrastructures. We used these artefacts in staging participatory processes of imagination and experimentation in order to explore possible future configurations. The project provides an example of a possible framework for initiating and curating the transformation of industrial systems towards more open and locally adaptive forms and functions.

In particular, it illustrates the rich potential and opportunities for design when it comes to ways of knowing and designing with the infra-structural – that which is usually hidden beneath the surface.

Keywords: drones, logistics, infrastructures, fieldwork, service design, speculative design.

Davoli et al. | *Re-connecting people: Tove posing with the Drone Postbox* | © Davoli

The Blue Plaque: Co-creating design fictions in the wild

Mel Woods | University of Dundee | m.j.woods@dundee.ac.uk
**Deborah Maxwell** | University of Edinburgh | d.maxwell@ed.ac.uk

Blue Room | Day 3 | Late Morning session

Abstract: Blue heritage plaques pepper the UK landscape expounding officially validated narratives celebrating past events, people, and buildings. This paper presents a novel method that draws on this specific cultural context to generate reflective, nano-stories, documenting them through populating a place and physical space. The guerrilla blue plaque method was designed to enable engagement, collaborative story development and exchange, initially as part of a wider UK arts and digital media festival and developed further for RTD 2015.

The authors' primary aim for the case study presented in this paper was to enable visitors to reflect on possible futures, in this instance the theme of future cities. This was achieved through co-creating shared stories via commemorative guerrilla versions of blue plaques.

This paper explores the rationale for re-appropriating the blue plaques as critical design artefacts to help understand the future hopes, needs, and goals for individuals and communities. We position the method in relation to action research, co-design and design fictions. Finally, by considering early findings and subsequent adaptions, we present new adoptions of the method, and reflect on the role of the guerrilla blue plaque as a feedback mechanism for participatory design and citizen engagement.

Keywords: co-creation, storytelling, critical design, design fictions, future, reflection.
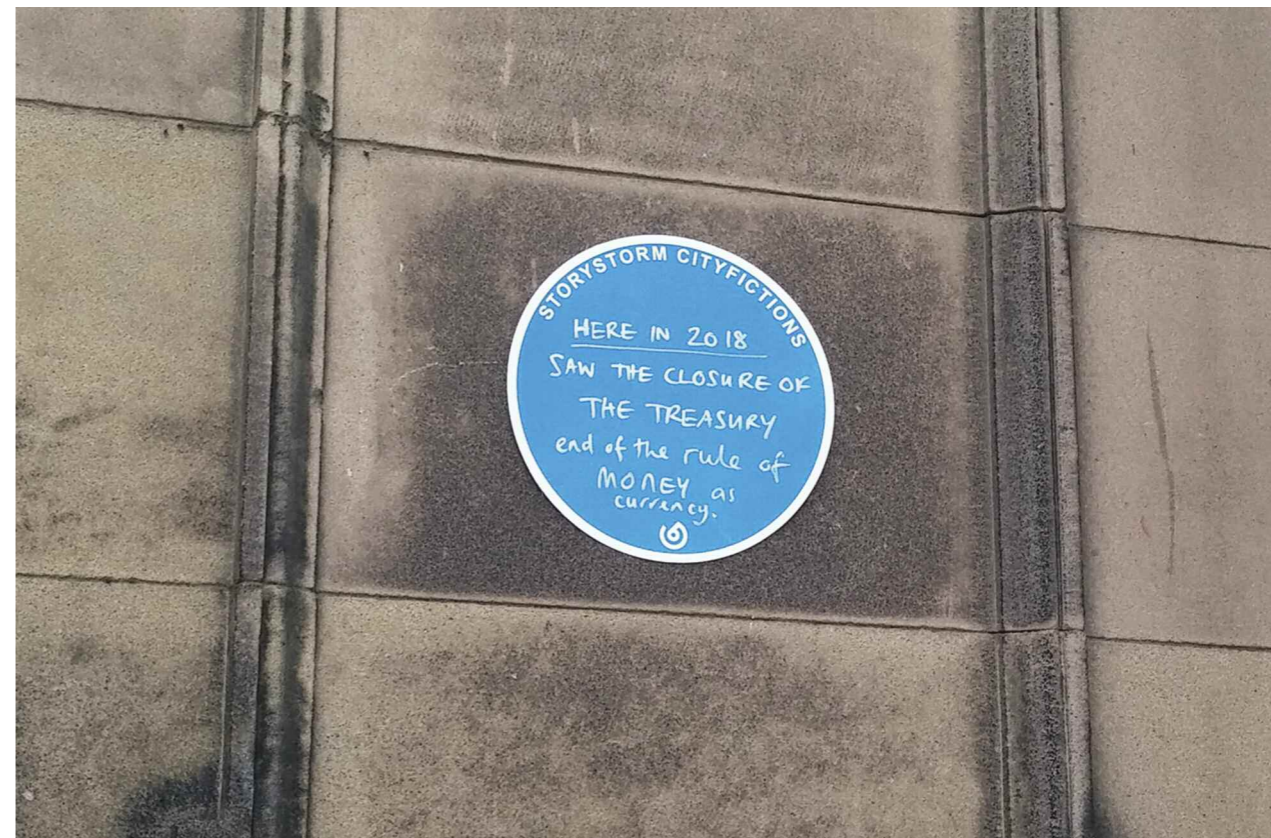
Woods et al. | *Storystorm guerrilla blue plaque, Manchester 2014* | © 2014

Investigating Lay Design through Prototyping a Toolkit for Audio Equipment

| Guido Hermans | Umeå Institute of Design, Umeå University **|** *guido.hermans@umu.se*

Black Room **|** Day 3 **|** Late Morning session

Abstract: Post-industrial design challenges the current way of design and production of consumer products. Leveraging from 3D printing and the potential of layperson involvement in the design process, we investigated how the relation between the professional designer and layperson might change in a democratised design process, where the layperson is an active participant, mediated by toolkit software.

In this research through design study we examined this relation by prototyping a toolkit for audio equipment based upon three personas and scenarios that we developed. Consequently three audio products have been made and fabricated using 3D printing.

In the second part of this study we staged a series of discussions with design practitioners around the material that we developed. In these interviews they discussed the role of the layperson and the professional designer, accountability of both, the ways in which this toolkit creates accessibility and adaptability and the aesthetics of the product prototypes.

The outcome of this study is, besides the objects and the web-based toolkit and a detailed description and discussion of the changing role of the designer and layperson, an insight that revealed the value of a research through design approach. Namely, in this study the material helped the design practitioners to become self-reflective.

Keywords: democratisation, post-industrial design, toolkits, 3D printing, lay participation.
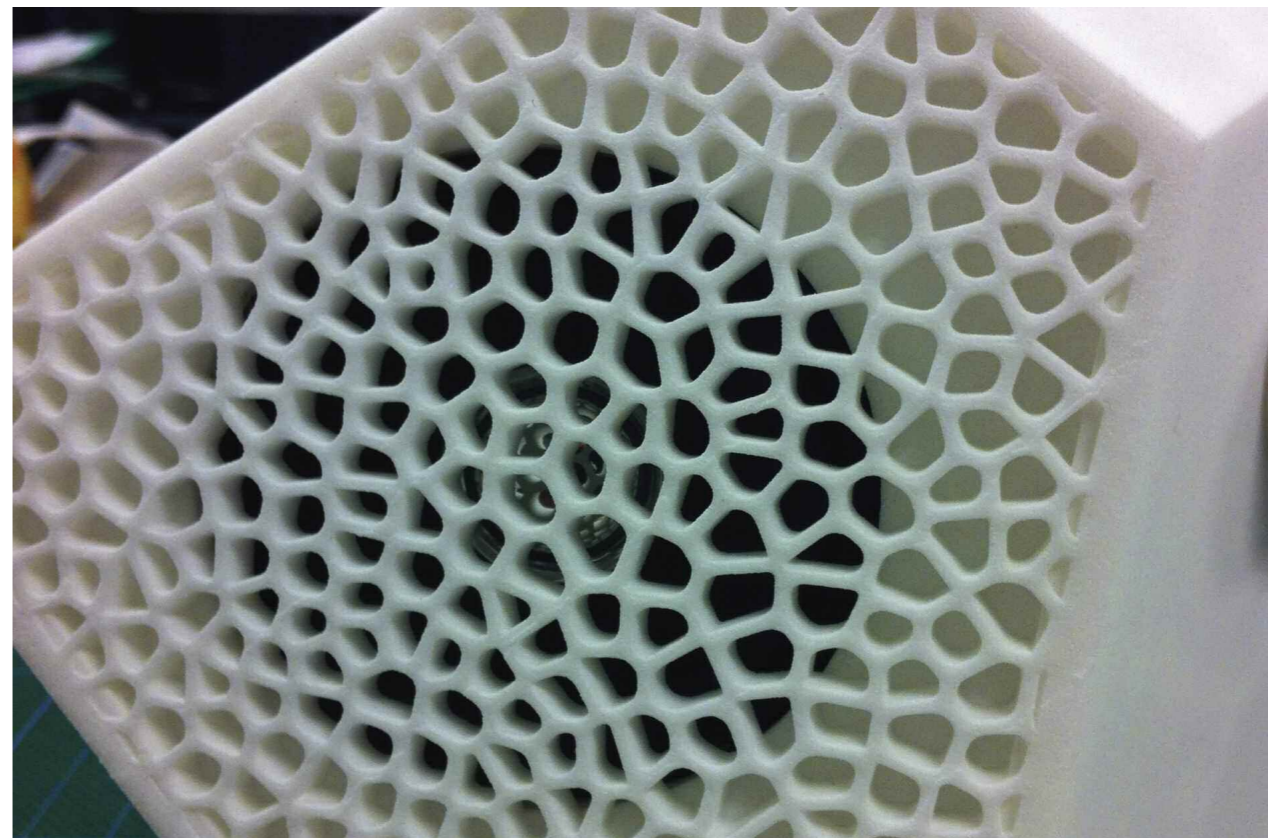
Hermans **|** *Detail of 3D printed prototype of portable radio* **|** © Guido Hermans

Synthetic Anatomies: Co-designing desirable 3D printed facial prosthetics

Bernard Guy | Victoria University of Wellington | *Bernard.guy@vuw.ac.nz*
Ross Stevens | Victoria University of Wellington | *Ross.stevens@vuw.ac.nz*
Zach Challies | Victoria University of Wellington | *zschallies@gmail.com*
Wayne Gillingham | Welloral Ltd. | *wayne@welloral.co.nz*

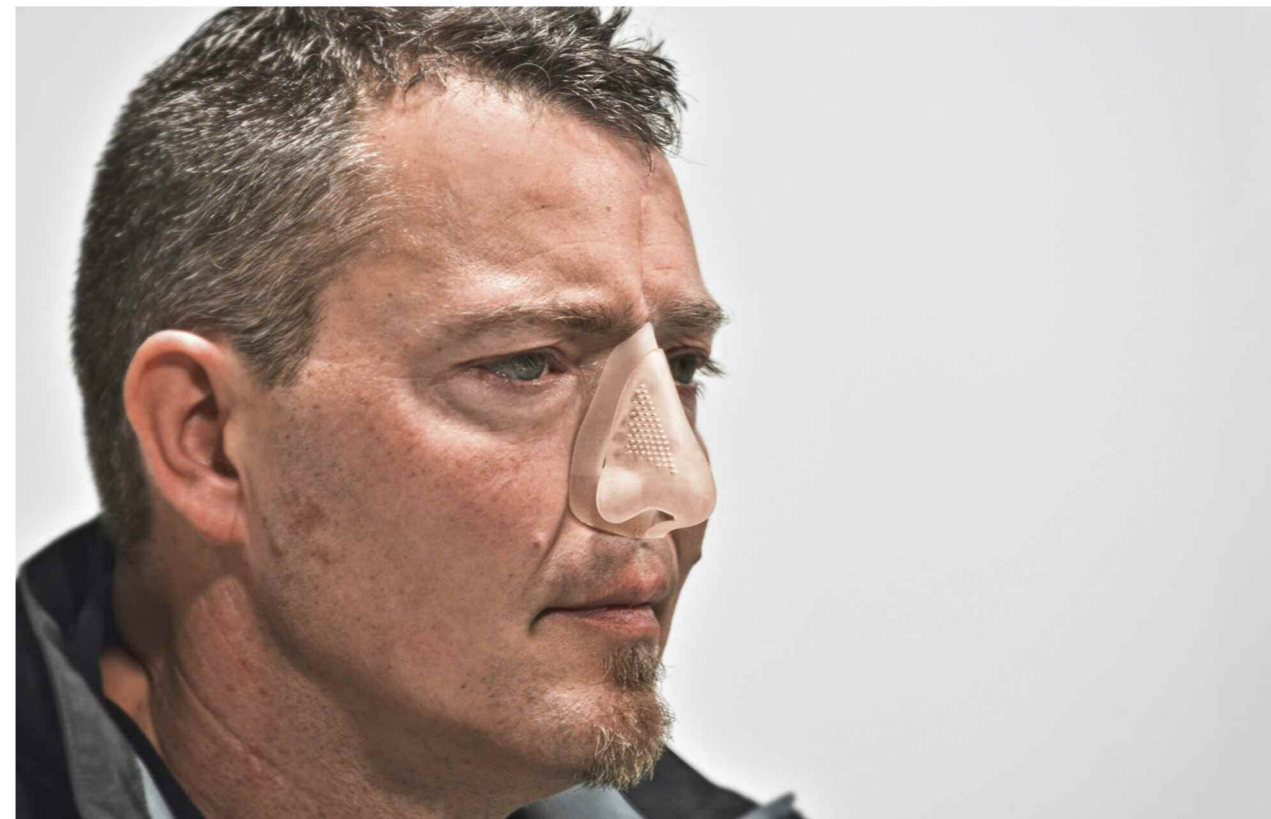Black Room | Day 3 | Late Morning session

Abstract: Desirable prosthesis is an early stage investigation formulated to explore the creative potential of 3D scanning and 3D printing in designing alternative facial prosthesis. The loss or disfigurement of a person's facial feature such as a nose or an ear is typically supplanted with a hand crafted silicon prosthesis designed to replicate the persons face pre-surgery. Our research sets out to counter the traditional medically orientated art of camouflaged reconstructive silicon prosthesis and explore the design of 3D printed distinct and desirable prosthesis.

Together, the participant, designers and a maxillofacial surgeon explore ways to think about how new prosthesis might fit, feel, empower and be made. In conjunction to this we explore 3D laser scanning and the Objet Connex multi-material 3D printer to build prosthesis which allow greater facial expression and personalisation for diverse social activities.

Designing desirable facial prosthesis proposes a shift from localised hand craft to a global digital process where prosthetic clients from around the world can interact, design and print personal prosthesis on 'state of the art' machines at a cost well below those hand crafted. Potentially enabling individual expression in performance, fit and aesthetics rather than the predominately ill-fitting attempts at camouflage currently prevalent.

Keywords: prosthesis, facial, 3D printing, anatomy, digital craft.

Guy et al. | *© 2014*

Re-knitting: Exploring openness through design

| **Amy Twigger Holroyd** | University of Leeds | *a.t.holroyd@leeds.ac.uk*

Black Room | Day 3 | Late Morning session

Abstract: This paper profiles a doctoral research project that investigated the idea of openness within fashion in order to understand the relationships between amateur fashion making, well-being and sustainability. The research was conducted through my practice as a designer-maker of knitwear.

The primary design activity involved the development of methods of 'opening' and re-knitting existing garments. This activity provided a practical platform through which I was able to explore openness at two, increasingly abstract, levels: first, opening my design practice to share design skills with amateur knitters; and second, opening fashion through amateur making.

I will show a sample garment featuring five different re-knitting 'treatments', which I produced while working with the research participants. The research produced an extensive re-knitting resource, and a nuanced understanding of the lived experience of wearing homemade clothes in contemporary British culture. Furthermore, the study generated transferable knowledge relating to the reworking of existing items and ways in which this can be supported; the abilities of amateurs to design for themselves and the conditions which encourage this activity; and the changes in practice and identity which take place as we shift between the roles of designer-maker and meta-designer-maker.

Keywords: open, knitting, fashion, metadesign, amateur.

Holroyd | Sample garment showing five different re-knitting 'treatments' | © Amy Twigger Holroyd

Col-lec-tion

| **Ruby Hoette** | Goldsmiths, University of London | *r.hoette@gold.ac.uk*

■ Black Room | Day 3 | Late Morning session

Abstract: Col-lec-tion is a visual research project exploring the notion of the 'collection' in order to critically reflect on the construction of meaning and value in the current fashion system. It employs methods of dissection and collage as tools with which to actively engage with the fluid and dynamic relationships that constitute fashion and the shifting role of the fashion designer.

Unpicking the garments along original seam-lines functions as a metaphor for the unravelling of the mechanisms that constitute pervasive fashion practices and production processes. The resulting loose material elements can then be rearranged into new formations or mappings and in turn, translated into proposals for alternative ways of engaging with fashion.

The project draws inspiration from personal wardrobes, within which various styles, brands and materials are brought together in each personal collection. It attempts to activate the tacit knowledge embedded in the practice of curating our wardrobes and in the daily act of dressing. The interactive exhibit invites participants to engage intuitively on a material level in order to inspire and inform a wider discussion around the roles of designer and wearer in contemporary fashion culture in an effort to explore innovative and inclusive modes of 'doing' and 'being' fashion.

Keywords: collection, fashion, value, dissection, wardrobe, wearer.
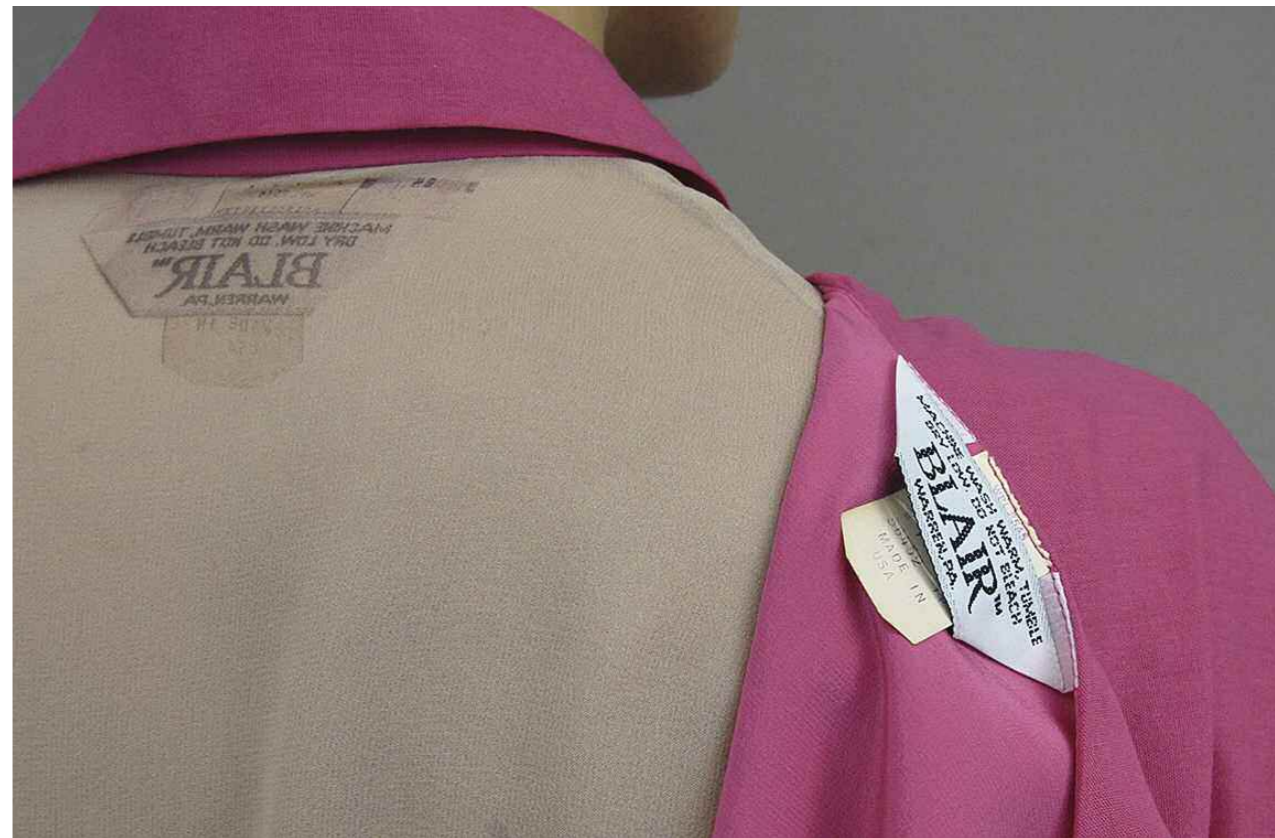
Hoette | Col-lec-tion – exploring innovative and inclusive modes of 'doing' and 'being' fashion | © Ruby Hoette

21ST CENTURY MAKERS AND MATERIALITIES

Closing Provocation: Sir Christopher Frayling

Main Auditorium | Day 3 | Afternoon session

Sir Christopher Frayling is a cultural historian, educationalist and writer who has started important and influential conversations about the nature of research and pedagogy in the creative arts and design. Until recently, Sir Christopher served as Rector of the Royal College of Art and Chair of the Arts Council England. Sir Christopher is an award-winning broadcaster on network radio and television, and author of 21 books on the arts, design and popular culture. He has chaired numerous committees and organisations, including the Design Council, the Royal Mint Advisory Committee and the Crafts Study Centre. Sir Christopher is currently Professor Emeritus of Cultural History at the Royal College of Art, Fellow of Churchill College Cambridge and Visiting Professor at the University of Lancaster. He was knighted in 2001 for Services to Art and Design Education.

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