



Crucible Network for Research in Interdisciplinary Design

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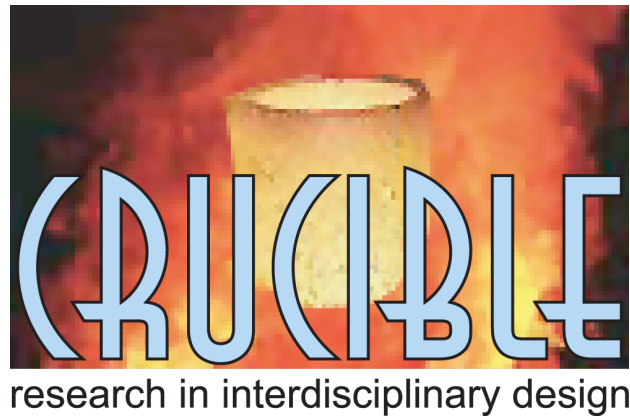
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Crucible Network for Research in Interdisciplinary Design

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Crucible is a research network that originated in the University of Cambridge in 2001, eventually becoming one of the largest research organisations dedicated to promoting rigorous research collaboration between technologists, and researchers in the Arts, Humanities and Social Sciences (AH&SS). The main focus of this collaboration was on design as a meeting point for widely differing research disciplines. Crucible activities included the establishment of new research programmes, training of researchers, input to policy bodies, and identification of suitable funding sources for research in interdisciplinary design. Crucible provided both a scientific and organisational framework for this research.

Why the name? The crucible has always been a melting pot for valuable materials, the origin of new alloys, materials of innovation. The Crucible founders believed that the post-industrial crucible must be a place where knowledge and ideas are blended and tempered.

This document has been created as an archive of the wiki that documented the activities of the Crucible network, previously maintained at <https://wiki.cam.ac.uk/crucible>

The live wiki, which had been maintained on a MediaWiki server hosted by the University of Cambridge Information Systems division, became unavailable after the managed wiki service was closed in September 2025.

Archive of Crucible network collaborations

The following archival report was created as a static export from the wiki that documented 196 interdisciplinary design and research collaborations involving members of the Crucible network and their collaborators.

Involvement of Crucible members in these projects ranged from funding and direct management of local teams to short-term consultancy, coordination and advisory input, with scale ranging from small local projects to large national and international initiatives. As a collaborative organisation dedicated to promoting activity outside its own boundaries, Crucible did not wish to claim ownership of any of these projects. Except where mentioned explicitly, we did not consider these projects to be 'owned' by Crucible, or to take responsibility or credit for them.

Format of Crucible collaborations

Crucible was a network of people and their projects, not an institute. Our approach was to establish, facilitate and maintain collaborations between academic and professional researchers whose expertise could contribute to the goal of interdisciplinary design research. This resulted in a matrix of connections: diverse projects, each structured in accordance with the skills and experience of the researchers involved, and a broad range of researchers both inside and outside the University. These projects were structured in many ways: as student design assignments, business consultancy, collaborative workshops, artistic productions, software products, workshops, conferences and others.

Acoustic Bio-diversity Monitoring

This project aims to develop citizen science approaches to bio-diversity monitoring, using tools for signal processing and classification of birdsong. Collaboration between members of the Cambridge Conservation Initiative and the Computer Laboratory.

Crucible team:

- [Isak Herman](#)
- [Alan Blackwell](#)
- [Chris Sandbrook](#)

Acquiring notational expertise

PhD research being carried out by [Alistair Stead](#), exploring the analogies between mathematics education and computer science education, to understand the ways in which competence in the use of notational systems mediates between formal conceptual knowledge and practical applied skills.

Supervised by [Alan Blackwell](#)

Collaborators, contacts and advisors include:

- [Ken Ruthven](#)
- [Wai Yi Feng](#)
- [Denes Szucs](#)
- [Ian Davies](#)
- [Stuart Wray](#)
- [Ian Hosking](#)
- [Glenn Woodcock](#) of Sparx
- [Hugh Collins](#) of Code Kingdoms
- [Tim Oates](#) of Cambridge Assessment

Across Design

Working with 20 senior designers in fields including architecture, aircraft, automobiles, fashion, medical devices and websites, to determine the processes and structures that represent best practice across design, coordinated by the [Engineering Design Centre](#).

The [comparative expert practice](#) workshop method developed for use on this project has subsequently been used by [Alan Blackwell](#) for other Crucible projects.

Project leader:

- [Claudia Eckert](#)

Crucible team:

- [John Clarkson](#)
- [Alan Blackwell](#)
- [Sebastian Macmillan](#)
- [Rachel Hewson](#)
- [Alice Street](#)

Other collaborators:

- [Chris Earl](#)
- [Louis Bucciarelli](#)
- [Dan Whitney](#)
- [Martin Stacey](#)

Workshop contributors:

- [Giles Oliver](#)
- [Paola Kathuria](#)

Advice consultations online

The Citizens Advice Bureau is a charity providing free advice on issues such as debt, family law and tenancy to a wide range of individuals, including many who are vulnerable or disempowered.

Cambridge Citizens Advice has been a leading innovator in the creation of Advice Hub Kiosks for online access to information in rural Cambridgeshire and elsewhere. This project is exploring ways in which the personal consultations between volunteers and clients in local offices differ from the structure of online information seeking.

Crucible members:

- [Vania Sena](#)
- [Kate Flannery](#)
- [Alan Blackwell](#)
- [Nikiforos Karamanis](#)

Project team:

- Rachel Talbot
- Georgios Christoforou
- Andrew Wilkinson

AffectVsketch

Prototype drawing application created by [Luke Church](#) to explore ways in which the rendering the dynamics of a pen stroke can promote or enhance particular kinds of emotional engagement.

Used by:

- [Mark Blythe](#)

African SMS Radio

This design project for client Alex Anderson at FrontlineSMS provided an initial feasibility study for the [FrontlineSMS:Radio](#) project.

Design brief:

In Africa, radio still rules, but it's mostly a one-way medium. Greater audience interaction could revolutionise radio, and help it play a role in the way citizens engage in public debates. You will help us tailor FrontlineSMS – a free software tool that turns a laptop and modem into a SMS communications hub (no internet needed) – to the uses of community and local radio stations. Radio stations in Africa will tell us what they'd like FrontlineSMS:Radio to do, and you will design a suitable UI and implement the functionality. Interface design will likely include interesting and informative ways of expressing large or smaller amounts of realtime text data for radio station operators. E.g. live word-clouds, message tickers, chart/voting for songs or discussion categories. Stations will also benefit from smart filtering and storing tools.

Undergraduate [group design projects](#)

Age and Meaning

As part of the cross-council UK New Dynamics of Ageing programme, a group of projects are investigating Age and Meaning, starting from research perspectives in the arts and humanities.

New Dynamics of Ageing homepage <http://www.newdynamics.group.shef.ac.uk/>

Age and Meaning group site: <https://camtools.cam.ac.uk/site.html?siteid=e4b3c520-8080-44ba-aa3c-2b68bc6c54af>

Crucible collaborators:

- [Alan Blackwell](#)
- [Mark Blythe](#)

AmbITion

What is the nature of innovation in the cultural sector? This policy project, working with the Arts Council of England, DCMS/Living East, AHRC and CRASSH, investigates whether information and communication technologies can support the creation of value out of arts and humanities research.

Crucible participants:

- [Alan Blackwell](#)
- [Lee Wilson](#)
- [David Leitner](#)
- [Dawn Giles](#)

Architectural ethnography

Investigating the conditions in the built environment that lead to innovation communities, this was an exploration of the relationship between the physical design of the BT research campus Adastral Park, and the experiences of the staff who work there.

Collaborators:

- [Mike Joroff](#) (MIT)
- [David Good](#)

Crucible Theme: Urban design and planning

Architectural views of information retrieval

This project carried out during the PhD research of [Martyn Dade-Robertson](#) applied an architectural design perspective to the visualisation of word frequency in information retrieval for data mining contexts.

Crucible team:

- [Martyn Dade-Robertson](#)
- [Ken Wood](#)
- [Ralph Sommerer](#)
- [Alan Blackwell](#)

Art-Science Research Fellowships

This national programme of experimental collaborations was jointly funded by the [Arts Council of England](#) and the [Arts and Humanities Research Council](#).

Several of the collaborations involved Crucible network members, including:

- [Wayne MacGregor](#)
- [Alejandro Viñao](#)
- [Simon Biggs](#)

The national programme also included an explicitly reflective component, coordinated by [James Leach](#), that brought all collaborators together in Cambridge for intensive workshops during which they were able to share and reflect on their experiences and the nature of the programme.

Artefacts of Encounter

How are objects and their meanings connected? Artefacts of Encounter is an investigation of cultural treasures, the museums where they are shown to the public, and the different communities of scholars and public who engage with them via technology.

Funded by ESRC

Project leader: Amiria Salmond

- Carl Hogsden

A Crucible design workshop with project researcher Carl Hogsden explored the understandings of cultural treasures across traditional cultures in England (traditional folk music) and New Zealand Maori.

Crucible collaborators:

- Alan Blackwell
- Sally Jo Cunningham
- Susan Rowley

Crucible Theme: Digital Humanities

Automated performance accompaniment

Personal music research project by Computer Lab PhD students Ian Davies and Meredydd Luff. This automated MIDI accompaniment system is able to play additional tracks of a MIDI score in synchrony with a human performer playing part of the score on a MIDI instrument.

The main technical achievements are inferring precise musical context (to millisecond level) on a probabilistic basis, and maintaining an instantaneous estimate of tempo.

Experimental evaluation of the system's potential as a performance aid is being planned in consultation with Crucible collaborators:

- Alan Blackwell
- Simon Godsill
- Ian Cross
- John Rink

Music technology (Crucible theme)

Bodies in Space

Research carried out by Cecily Morrison, this project considered how a clinical information system influenced interaction during ward rounds in critical care. It delved into a range of methodologies for exploring embodiment.

Results are reported in Cecily's PhD dissertation: <http://www.cl.cam.ac.uk/techreports/UCAM-CL-TR-771.html>

Research papers include: Morrison, C., Fitzpatrick, G. and Blackwell, A.F. (2011). Multi-disciplinary collaboration during ward rounds: Embodied aspects of electronic medical record usage. *International Journal of Medical Informatics* 80(8), pp e96-e111.

Morrison, C & Blackwell, A.F. (2009). Hospital user research using new media arts. In *People and Computers XXIII - Celebrating People and Technology*, Proceedings of HCI 2009. British Computer Society, pp. 345-353

Crucible collaborators:

- Alan Blackwell
- David Good
- Alain Vuylsteke
- Matthew Jones

Crucible Theme: Healthcare IT

Bridging the Global Digital Divides

This was an early EPSRC Ideas Factory - an initiative to bring together researchers from a variety of disciplines around a common problem. This large-scale research programme was originally proposed by Crucible members at Aptivate. Alan Blackwell was appointed as Director of the ideas factory, coordinating over 1.5 million pounds of new research funding aimed at applications of ICT in rural and developing

economies, resulting in four interdisciplinary research projects, together with a reflective coordinating network.

The resulting projects are documented on the BGDD site: <http://www.bgdd.org/Wiki.jsp>

Crucible leaders:

- [Alan Jackson](#)
- [Alan Blackwell](#)

Crucible collaborators:

- [Bill Thompson](#)
- [Quentin Stafford-Fraser](#)
- [Ann Light](#)
- [Andy Dearden](#)
- [David Frohlich](#)
- [Seb Wills](#)

Crucible Theme: Humanitarian IT

British library in the digital age

A Crucible team led by [David Good](#) convened a design workshop to develop proposals for the British Library, responding to changing digital media environments with changes to the urban environment around the central British Library site. The Library continues to develop ideas in this area, most recently working with [Alan Blackwell](#). The general planning approach to the project has been continued in the [New Century Cities](#) and [MediaCityUK](#) projects.

Project team:

- [Dennis Frenchman](#)
- [Michael Joroff](#)
- [Alexis Sanal](#)
- [William Mitchell](#)

Business value of social networking

Funded by Boeing Corp, funded PhD studentship being carried out by [Michal Kosinski](#)

Crucible team:

- [David Good](#)
- [Alan Blackwell](#)

Recent article in the [Research Horizons](#) magazine: <http://www.cam.ac.uk/proxyresearch/features/the-business-of-social-networking/>

Button brain

This design concept project explored the potential to offer Internet of Things capabilities to children, through an ultra-low cost construction set. The central communications processor, "Button Brain", would be cheap enough to give away on the cover of a magazine, and robust enough to be nailed to a tree, glued to a wall, or attached to a dog's collar. Peripherals using energy harvesting could pull strings or make water flow. A typically playful use case was "imagine how could you surprise a squirrel".

Project team:

- [Alan Blackwell](#)
- [Saar Drimer](#)
- [Jeff Osborne](#)
- [Robert Mullins](#)

Advisers:

- [Mark Gross](#)

Cambridge Digital Humanities Initiative

How is the nature of the university changing, and being challenged by, ICT? The Cambridge Digital Humanities Initiative is coordinated by CRASSH, with representatives from CARET, Crucible, and the Cambridge University Library.

Cambridge Governance Labs

Cambridge Governance Labs is a new interdisciplinary initiative (based at Hughes Hall and directed by John Barker) to promote good governance in developing countries. It does so by focusing on decision-making and the factors that enhance or degrade decision-making capability. Good governance relies on sound decisions and the right balance of power between society and its leaders. By equipping citizens and leaders alike to make better decisions, we seek to enhance productivity, reduce conflict and empower stakeholders to work more harmoniously towards common social and development objectives. International cross-disciplinary events will bring together academics and practitioners from across the University and beyond. Research and event findings will then be translated into practical tools to be tested in pilot projects in Africa and made freely available online and through publications.
<http://www.governancelabs.org>

Choreographic Language Agent

The Choreographic Language Agent project is developing an intelligent tool for dance-makers that will broaden understanding of the unique blend of physical and mental processes that constitute dance and choreography.

Project led by [Scott deLahunta](#) under the umbrella of Random Dance R-Research, funded by Portland Green Cultural Projects.

Collaborators include [Marc Downie](#), [Nick Rothwell](#), [Luke Church](#), [Phil Barnard](#) and others

Crucible Theme: Dance research

Choreography and Cognition

A project funded by Arts Council of England and the AHRC under the [art and science research fellowships](#) programme, this involved two choreographers, ten dancers, six psychologists and neuroscientists, a film-maker and an anthropologist working together to discover the cognitive grounding of movement and choreographic practice at Random Dance Company.

The project contributed to development of the Random Dance production [AtaXia](#)

Subsequent Crucible research engagement with Random Dance R-Research has included the [Choreographic Language Agent](#) project.

Published description in McCarthy, R., Blackwell, A.F., deLahunta, S., Wing, A., Hollands, K., Barnard, P., Nimmo-Smith, I and Marcel, T. (2006). Bodies meet minds: Choreography and cognition. *Leonardo* 39(5), 475-478.

Crucible collaborators:

- [Wayne MacGregor](#)
- [Scott deLahunta](#)
- [Rosaleen McCarthy](#)
- [Alan Blackwell](#)
- [Phil Barnard](#)
- [Alan Wing](#)
- [Tony Marcel](#)
- [Ian Nimmo-Smith](#)
- [James Leach](#)
- [Kirsten Hollands](#)
- [Charles Martinez](#)

Crucible Theme: Dance research

Citizen science in the field

Can mobile phone hardware and applications be used as a tool for scientific research to take place in a scale and range of geographic locations beyond those available to professional researchers? There are many areas of science, such as ornithological conservation research, where the communities of amateurs and volunteers are substantially larger and more widely distributed than the professional research community. This project is exploring the extent to which commodity smartphone hardware can be turned into a productive scientific instrument allowing both data collection and analysis to be performed in the field.

Crucible team:

- [Isak Herman](#)
- [Alan Blackwell](#)
- [Chris Sandbrook](#)

Citizen science pet monitoring

Investigation of the potential to encourage young people with interests crossing veterinary science and technology, by creating a low cost toolkit that can be used to collect data on animal behaviour using a Raspberry Pi camera module.

- [Alan Blackwell](#)
- [Daniel Low](#)
- [Nai-Chieh Liu](#)
- [Jane Ladlow](#)

Co-design in hospitals

How are design artefacts created and shared in situations where a range of professional and users are taking shared responsibility for the creation of new systems? this project has a focus on discourse and representation, within a healthcare setting, as a component of the NIHR Collaboration for Leadership in Applied Health Research and Care (CLAHRC) programme <http://www.clahrc-cp.nihr.ac.uk/>

Crucible team:

- [Ting-Ray Chang](#)
- [Nathan Crilly](#)
- [Alan Blackwell](#)

Crucible Theme: Healthcare IT

Coded Chimera

Coded Chimera is a project exploring relationships between sculptural form making and biological morphogenesis through computer modelling. Led by sculptor [Bruce Gernand](#), and in collaboration with [Norman MacLeod](#) at the Natural History Museum and [Alan Blackwell](#), the final phase of the project has resulted in an exhibition at the Cambridge Museum of Zoology.

<http://www.museum.zoo.cam.ac.uk/exhibitions.displays/temporary.exhibitions/>

<http://www.brucegernand.com/publication5.php>

Collaboration in Internet Science

A study of interdisciplinary collaborative processes within the European Internet Science initiative.

- [Karmen Guevara](#)
- [Alan Blackwell](#)

Collaborative performance technology

Funded by the AHRC [ICT Methods Network](#), this joint project was hosted by the Anglia Ruskin University [Digital Performance Laboratory](#) and [CRASSH](#). It combined hardware hacking with performance/demo perspectives on technology use.

Archive site: <http://www.cl.cam.ac.uk/conference/performancecetechnology/>

Crucible participants:

- [Julio d'Escriván](#)
- [Richard Hoadley](#)
- [Nick Collins](#)
- [Ian Cross](#)
- [Alan Blackwell](#)
- [Catherine Hurley](#)
- [Chris Nash](#)
- [Tom Hall](#)
- [Andrew Lovett](#)
- [Dan Tidhar](#)

Crucible Theme: Digital Humanities

Community music in the streaming age

Despite the ubiquity of digital media, there are many health and wellbeing benefits gained by coming together to make music in community settings. This project is exploring the experiences of people who participate in community music groups as a component of their social identity during life course changes. These groups also make use of streaming media in ways that differ from the pop music/youth demographic that is generally regarded as shaping the recorded music industry.

Crucible team:

- [Mao Mao](#)
- [David Good](#)
- [Alan Blackwell](#)

Composer in residence - Alejandro Viñao

[Alejandro Viñao](#) has spent two periods in Cambridge as an artist in residence, one funded by the ACE/AHRC working with [Ian Cross](#) in the [Centre for Music and Science](#), and one funded by the [Leverhulme Trust](#), working with [Alan Blackwell](#) in the [Computer Laboratory](#).

In both of these he explored [Digital editing techniques for electroacoustic composition](#), and in the second, had a specific research interest in [interaction with musical polytempi](#).

Crucible Theme: Music technology

Composer in residence - Cheryl Frances-Hoad

[Cheryl Frances-Hoad](#) was appointed as a composer in residence in the department of [Psychiatry](#), with funding from the [Leverhulme Trust](#).

Her host in the department was [Paul Fletcher](#), with a variety of collaborators including [Alan Blackwell](#). The resulting piece, "Song without words" (2009) received its premiere at the annual conference of the [Cambridge Neuroscience Initiative](#).

Computational aesthetics

The research workshop "Computational Aesthetics as a Negotiated Boundary" was a project funded by the [CREATOR network](#). The objective was to investigate the ways in which the boundary between artistic practice and technology research results in reconceptualisation of what we mean by aesthetic experience.

The workshop was hosted at [CRASSH](#) and applied the [Blackwell-Leach Method](#) for facilitation of interdisciplinary design workshops.

Project leaders:

- [Alan Blackwell](#)
- [Neil Dodgson](#)

Crucible participants:

- [Nathan Crilly](#)
- [Satinder Gill](#)
- [Scott deLahunta](#)
- [Nick Collins](#)

Publication:

Blackwell, A.F. and Dodgson, N.A. (2010). Computational aesthetics as a negotiated boundary. *Leonardo* 43(1), 88-89. <http://dx.doi.org/10.1162/leon.2010.43.1.88>

Computer listens to robot music

The violin family of musical instruments produces its rich effects through an astonishingly complex combination of mechanical and acoustical phenomena, many beyond our current ability to model. It seems likely that the evolution of these instruments, and the cultural and emotional effects they have on listeners, result from this very complexity.

In this project, we are exploring the properties of the instrument itself by digital control of both the way it is played and the analysis of the resulting sound. A robot bowing machine activates the string of a cello with a resin-covered glass rod, using a fully varied combination of speeds and pressures. A force recording of the energy transferred to the violin body is then used to train an unsupervised machine learning system, with the goal of discovering what makes the difference between a "good" and "bad" bow stroke - a range of behaviours and resonance regimes that take expert players years to master, described traditionally by terms such as "spiccato", "martelé" and many others.

Team:

- [Leo Impett](#)
- [Rich Turner](#)
- [Jim Woodhouse](#)
- [Alan Blackwell](#)

Conversation support for dementia

People with Alzheimer's disease have increasing difficulty in communicating as the disease progresses, even with members of their own family. [Lorisa Dubuc](#) is working with public health professionals and community volunteers to investigate whether modern communication devices can assist communication by those with the disease -- even among people in the same house. Project funded by [Boeing Corporation](#).

Crucible team:

- [Lorisa Dubuc](#)
- [Alan Blackwell](#)
- [David Good](#)

Creative Cambridge

Six month project carried out by [Rachel Drury](#), as a visiting researcher from [Arts Council England](#) at the University of Cambridge Computer Laboratory.

The object was to explore ways of enhancing publicly engaged creative experimentation in Cambridge. Is there the potential for Cambridge to become a centre for publicly engaged creative experimentation involving collaboration between the arts and technology sectors?

Aims

1. To develop a sustainable approach to collaboration between the professional arts and technology sectors in Cambridge, building on the City's USP as a globally important centre for technology innovation.
2. To support professional artists and arts organisations to build their capacity and confidence in working with technology, leading to new experimental, creative practice that engages with the public

Outcomes

- [Defining Pi](#)
- [Sonic Pi: Live & Coding](#)

- Collusion

Critical Care for the World

This undergraduate group design project in 2010 worked with client Tariq Khokhar from Aptivate. The results were used to demonstrate potential for novel mobile applications during the initiation of the FrontlineSMS:Radio project.

Design brief:

In wealthy countries, hospital intensive care units often use sophisticated data monitoring and capture systems like IMDsoft MetaVision to enforce procedures and collect information about various drugs and patient vital signs. The World Health Organisation needs to establish more rigorous care and data collection for the kinds of emergency field hospital that deal with outbreaks of new viral infections like Ebola. But such a system would need to be customised for each site, by local staff, to deal with the huge variation in local training and resources. Your task is to design a field- customisable critical care system that could report research data to the WHO, while continuing to operate with the range of network connections, power supply and hardware availability typical in remote regions.

Crucible collaborators:

- Adona Iosif (student team member)
- Cecily Morrison
- Alan Blackwell

Crucible Theme: Humanitarian IT

Crucible Theme: Healthcare IT

Critical coding

An experimental short course for graduate students, post-doctoral researchers and faculty, with participants drawn equally from Technology, and from Arts, Humanities and Social Sciences. Taught at CRASSH, this is a joint venture between the Computer Laboratory and the Cambridge Digital Humanities Initiative.

<http://www.digitalhumanities.cam.ac.uk/Methods/Criticalcoding2014>

Crucible team:

- Alan Blackwell
- Anne Alexander

Critical design textbook

This book (now under contract with MIT Press) aims to provide an introductory textbook in critical and media theory, suitable for technology-oriented design students.

Title: Critical Theory and Interaction Design

Project team:

- Jeff Bardzell
- Shaowen Bardzell
- Mark Blythe

Topics and authors include:

Poetics

- Bakhtin - McCarthy & Wright
- Eco - Blackwell
- Iser - Feinberg

Poststructuralism

- Barthes - [Still Arm Twisting]
- Baudrillard - Satchell
- Foucault - Bowers

Critical Social Science

- Hall - Churchill
- Latour - DiSalvo
- Scott - Sengers

Marxism

- Althusser - Dourish
- Benjamin - Pold
- Marcuse - Stolterman
- Zizek - Blythe

Feminism and Postcolonialism

- Butler - Light
- Kristeva - S Bardzell
- Said -

Philosophers of Art

- Aristotle - Cockton
- N. Carroll - J Bardzell
- Kaprow - Boehner
- Kierkegaard - Bertelsen

Cross-cultural partnership template

Created by James Leach, Wendy Seltzer and Jon Ippolito, this project provided a template agreement for research and other encounters between cultures. In Crucible, this has been interpreted as potentially referring to different research cultures in a Western context, rather than being restricted to the cultural perspectives of traditional anthropology as described in the Subversion, Conversion and Development conference where the template was discussed.

The template itself is available here:

http://newmedia.umaine.edu/stillwater/partnership/partnership_template.html

The Crucible project Improcess used the template as a basis for negotiating collaboration between Anglia Ruskin University, the Centre for Music and Science and Computer Laboratory, and staff at Microsoft Research Cambridge who engaged in the project in a private capacity. The project results have been extremely successful - although this need not be attributed solely to the template!

Cross-disciplinary diagrams group

This forum established by Alan Blackwell pre-dated the creation of the Crucible network, but established some of the later working practices for Crucible. Collaborators from Psychology, Music, Architecture, Linguistics, Engineering, Computer Science and History and Philosophy of Science addressed topics related to visual representation from a range of theoretical and methodological perspectives.

- Clare Gilmour
- Huw Richards
- Robin Milner
- Reviel Netz
- Philippa Gardner
- Vivien Law
- Mike Trinder
- Paul Richens
- Timothy Horton
- Chris Haley
- Yuri Engelhardt

The work was later picked up in projects by Nathan Crilly, Rob Phaal and Barry Hedley

Culture quest

Project funded by the Nesta, Arts Council of England and AHRC programme of Digital R&D for the Arts.

Crucible team:

- David Scruton
- Anne Alexander
- Carl Hogsden

Culture, Communication and Change

A project examining how people, young and old, at home and at work are using communications today in the US, UK, China and Australia. It is designed to provide analytic value and insight for planning future generations of retail communications services.

Sponsored by BT, and initiated by Jeff Patmore, this research explored the impact of new communication technologies on family life on several continents. Field research was managed from the Cambridge Engineering Design Centre, with contributions from several other universities. The project resulted in several edited reports, press coverage, and launch of the 'balanced communications diet':

<http://www.btlife.bt.com/technology-and-communication/introducing-our-balanced-communications-diet/>

Collaborators:

- Jeff Patmore - Crucible liaison at BT
- John Clarkson - principal investigator
- David Good
- Alan Blackwell

Customisation of electronic patient records

This project explored the organisational and personal dynamics when clinical information systems are being customised to reflect local practices within a hospital.

Publications: <http://www.ppig.org/papers/22nd-EUP-1.pdf>

Morrison, C., Blackwell, A.F. and Vuylsteke, A. (2010). Practitioner-customizable clinical information systems: a case-study to ground further research and development opportunities. *Journal of Healthcare Engineering* 1(3), 297-314.

Morrison, C & Blackwell, A.F. (2009) Observing end-user customisation of electronic patient records. In V. Pipek, M.-B. Rosson, B. de Ruyter and V. Wulf (Eds). *Proc. 2nd International Symposium on End-User Development, IS-EUD'09*. Springer Verlag (Lecture Notes in Computer Science - LNCS 5435), pp. 275-284.

Crucible team:

- Cecily Morrison
- Alan Blackwell
- Caroline Gerrard
- Alain Vuylsteke
- Luke Church

Darwin Tree of Life

Development of a spatially interactive sculpture based on Charles Darwin's famous sketch.

- Issam Kourbaj
- Richard Bray
- Mauro Overend
- Alan Blackwell
- Tommy Nilsson
- Dean Hawkes
- Mike Sheppard
- Simon Schaffer

Dasher

Dasher is a technique for entering text with minimal physical movement. It demonstrates the value of applied information-theoretic approaches to interaction design. Originally invented by [David MacKay](#), many variants of the basic Dasher system have been created by members of the Inference Group.

Project website: <http://www.inference.phy.cam.ac.uk/dasher/>

Led by: [David MacKay](#)

Other Crucible collaborators:

- [Alan Blackwell](#)
- [Per Ola Kristensson](#)
- [Chris Smowton](#)
- [Phil Cowans](#)

Data analysis in Somali

This project was funded by the [Global Challenges Research Fund](#) to create a new tool suitable for use by researchers and translators at [Africa's Voices Foundation](#).

Coda is a Javascript-based tool that runs in a standard web browser on a variety of platforms. It supports rapid coding of SMS data, with facilities for machine learning backend processing that support mixed initiative automation and workflow management.

Crucible team included:

- [Ana Semrov](#)
- [Luke Church](#)
- [Alan Blackwell](#)
- [Alexander Simpson](#)

Defining Pi

This Arts Council-funded project in collaboration with Wysing Arts commissioned five visual artists with mixed technical abilities to undertake a six week R&D project using the Raspberry Pi, Sonic Pi and new camera module. The work and associated process will be shared with young people, artists & the public via local talks and documentation on the web.

Crucible team:

- [Rachel Drury](#)
- [Sam Aaron](#)
- [Alan Blackwell](#)

Other collaborators:

- [Donna Lynas](#)
- [Gareth Bell-Jones](#)

Defining Pi aimed to

- create new digital opportunities for artists to produce new work using extraordinary technology that has yet to be tested in this way
- to develop new artistic practices that engage new audiences with the arts and inspire them to create their own work
- to develop new partnerships between the arts and Cambridge's world renowned technology innovation sector

We commissioned five experienced visual artists to undertake a short R&D project using the Raspberry Pi and its newly released camera module. The Pi, developed in Cambridge as a charitable, open source venture to encourage coding amongst young people, has quickly become a global phenomenon, and at just £25 per computer, is low cost and extremely portable, presenting many creative opportunities for artists. The artists will be amongst the first in the world to use the camera, making their finished work valuable to the huge online community that has sprung up around the Pi. They were the first people in the world outside of three pilot schools to have access to Sonic Pi, a tool designed by Sam Aaron, to allow

children to program their own digital music.

For this project, Sonic Pi was extended to support the new high definition camera module to allow the programmatic interaction of imagery and sound. This extension was written exclusively with the artists as a specific audience using the test workshop as a requirements gathering exercise. The artists work was the first to showcase this new technology which will then be adapted for a classroom context. After the project, this tool will be made extensively available for use by artists and anyone else via the open source Raspberry Pi website.

A key aim of this project was to test and support new ways of creating art using this new technology and the process of programming the Raspberry Pi will be an intrinsic part of the artistic output. To this end, we will deliberately use an invitation-led strategy, led by Wysing Arts Centre, to ensure that the 'sample' of five artists commissioned are not just those who would ordinarily chose to work in this way. The artists' brief is attached. Prior to the start of the programme, 10-12 artists will be approached to attend an introductory session at University of Cambridge (CU) Computer Lab, to help them to understand and appreciate the scope of the project, the technology, and the expectations of the artists. Following this, if our funding bid be successful, the artists will be invited to submit an expression-of-interest to be considered for these commissions, summarising their experience of the session and describing how they might apply what they have learnt to their work; to demonstrate both artistic potential and technical commitment. The final five artists will be selected by the project team.

The programme will start with a one day workshop for rapid prototyping, allowing the artists time to experiment and get hands on advice on what may be possible. A second half day workshop will be held two weeks later to support the artists' developing project. Between the two workshops, artists will feed back to Sam on their developing project so that he is able to provide focused support at the second workshop. Both workshops will be held at Wysing.

In order to test the potential of this technology with artists of mixed technical abilities, the artists will deliberately receive only a limited amount of technical support. Beyond the two workshops, it will be up to them to source ideas and support online, through the Raspberry Pi Forum and other similar sites, accessing the worldwide open source community, and by joining Makerspace. However, if an artist is genuinely struggling, there will be safety nets in place to help them get back on track. Despite this, it is possible that, due to the experimental nature of the project, not all of the artists will achieve a final piece of work but we see this as part of the risk taking nature of introducing artists to new technology. If this happens, it will still be interesting and important to discuss and share this experience as part of the learning process.

The artists had around six weeks to develop their project after which they came back together for a half day session to share and discuss their work with each other and the project team before embarking on a series of 'show & tell' talks and workshops.

Design approaches to drug discovery

A series of projects commissioned by pharmaceutical company ArQule (originally for the startup company Camitro, acquired by ArQule in the course of the work) explored the potential for visualisation of probability spaces resulting from quantum simulation of drug compound behaviours, combining these with a sociological exploration of the laboratories within such data was used. The results were developed through an interaction design process into products that continue to be influential, most recently in the foundation of Cambridge company Optibrium by members of the team.

Crucible collaborators:

- Matt Segall
- Alan Blackwell
- Rachel Hewson
- Ed Champness
- Brett Saunders
- Andrew Barry
- Georgina Born
- Janine Tolliday
- Michael Tarbit

Design education in the UK and China

This research fellowship undertaken by [Qin Jingyan](#) is focused on "Comparative Research between UK and China on Interaction Design Education and Sustainable Creative Industry". The research is carried out over a six month period in 2011/12, including an extended visit to Cambridge to interview Crucible network members.

Design education (Crucible theme)

Design for humanitarian relief

Working with technology consultancy TTP, this workshop developed concepts for humanitarian relief in an African conflict zone, as an intentionally non-Western context to experiment with alternative catering infrastructure technologies. The workshop allowed participants to explore alternative solutions within a context of media role-play around a situation map augmented with 3D sketch prototypes.

Crucible team:

- [Alan Blackwell](#)
- [Sharath Srinivasan](#)

Collaborators:

- [Gino Henry](#) (Public Health Engineer)
- [Neil Owen](#) (TTP)
- [John Stanton](#) (TTP)

Design in Science

How can design play a useful role in early stage scientific research? The Design in Science project at the Institute for Manufacturing is conducting a series of practical experiments working with a wide variety of Cambridge departments.

Project led by [James Moultrie](#)

Design intent

This research area is led by [Nathan Crilly](#)

[Alison McDougall-Weil](#) is studying design intent and the subsequent user experience of architecture, specifically laboratories designed for experimental bioscience. The designs for such laboratories are frequently innovative, and often intended by the client and the architect to foster (or change) the culture of daily scientific practice. What the design intentions were, and how these buildings shape scientists' experiences and actions, is explored empirically through a multi-site ethnography of several US and UK bioscience research laboratories. The purpose of the study is to relate user experience to design expertise, offering insights to improve future designs.

Previous research on design intent has explored the different factors that shape the form of consumer products in industrial design practice. In particular, interviews with designers were conducted to investigate the intentions that they had for how their products should be interpreted and what the relationship was between those intentions and users' subsequent experiences. A new research project looks at this the other way around and examines how, when and to what effect users attribute intentions to designers. Publications include:

Crilly, N., Moultrie, J. and Clarkson, P.J. (2009) 'Shaping things: intended consumer response and the other determinants of product form' *Design Studies*, 30(3), 224-254.

Crilly, N., Maier, A. and Clarkson, P.J. (2008). 'Representing artefacts as media: Modelling the relationship between designer intent and consumer experience' *International Journal of Design*, 2(3), 15-27.

Crilly, N., Good, D., Matravers, D. and Clarkson, P.J. (2008) 'Design as communication: exploring the validity and utility of relating intention to interpretation' *Design Studies*, 29 (5), 425-457.

Crilly, N., Moultrie, J. and Clarkson, P.J. (2004) 'Seeing things: consumer response to the visual domain in product design' *Design Studies*, 25 (6), 547-577.

Crucible collaborators:

- [Nathan Crilly](#)
- [David Good](#)
- [Alison McDougall-Weil](#)

Design, Theory and Society

This first-year design syllabus for Cambridge computer science students was developed in response to a suggestion by [Gillian Crampton-Smith](#), and developed with input from Crucible members teaching design courses elsewhere:

- [Andy Dearden](#)
- [Mark Gross](#)
- [Ellen Do](#)
- [Louis Bucciarelli](#)
- [Sally Fincher](#)

The course was advertised in the 2007 Cambridge prospectus, but subsequently withdrawn before accepting any students, after review by the teaching committee of the [Computer Laboratory](#), on the basis that the department could not guarantee continuity of a course where teaching was distributed among members of the Crucible network.

Practical sessions were to be taught in a studio style, with students working on practical design assignments in a shared space with dedicated tutors. "Lecture" hours were to be taught in seminar style rather than as formal lectures.

The syllabus is documented in: Blackwell, A.F. (2007). Toward an undergraduate programme in Interdisciplinary Design. University of Cambridge Computer Laboratory Technical Report UCAM-CL-TR-692.

<http://www.cl.cam.ac.uk/techreports/UCAM-CL-TR-692.html>

Core components of the course would have been taught by [Alan Blackwell](#), [Nathan Crilly](#), [David Good](#) and [Lee Wilson](#), with contributions from other Crucible members in the University including:

- [David MacKay](#)
- [François Penz](#)
- [Maureen Thomas](#)
- [Mark de Rond](#)
- [James Moultrie](#)
- [Matthew Jones](#)
- [John Clarkson](#)
- [Ian Cross](#)
- [Martin Kusch](#)
- [Robin Boast](#)
- [Jackie Scott](#)
- [Melissa Lane](#)
- [Mia Gray](#)
- [Heather Cruickshank](#)
- [Simon Blackburn](#)
- [Tim Lewens](#)
- [Mary Jacobus](#)

A number of Crucible members elsewhere in Cambridge had agreed to act as external tutors:

- [Dawn Giles](#)
- [John Knell](#)
- [Alex Taylor](#)
- [Richard Harper](#)
- [Bill Thompson](#)

Guest tutors had also been selected from among Crucible members at other universities:

- [Julio d'Escriván](#)
- [Richard Hoadley](#)

- [Claudia Eckert](#)
- [James Leach](#)
- [Elisabeth Hill](#)
- [Andrew Barry](#)
- [John Naughton](#)
- [Mark Blythe](#)
- [Sally Fincher](#)
- [Marian Petre](#)
- [Simon Biggs](#)

[Crucible Theme: Design education](#)

DesignScript

A creative design tool developed at Autodesk, in a team led by [Robert Aish](#) and [Luke Church](#).

<http://designscript.ning.com/>

Digital culture in society

Crucible led the bid for the creation of a national Digital Economy research hub to be based in Cambridge, jointly hosted by the University of Cambridge and [Anglia Ruskin University](#).

The Crucible proposal was one of those shortlisted for funding in 2009, but the eventual funding decision was that there would be no UK research hub dedicated to digital culture or creative economy research.

Anglia Ruskin subsequently followed through its commitment to this proposal, establishing the research centre [Cultures of the Digital Economy](#), building on some of the themes that had been proposed for the national hub. Members of that centre have continued to engage in Crucible activities, and with the [Digital Humanities](#) initiative at [CRASSH](#). [Alan Blackwell](#), who had led the hub bid as nominated Director, was made an honorary research fellow of Anglia Ruskin, and an advisory board member for CoDE.

Core Crucible team:

- [Alan Blackwell](#)
- [Tamsin Mann](#)
- [Eugene Giddens](#)
- [David Good](#)
- [Bill Thompson](#)

Research area directors:

- [Georgina Born](#)
- [François Penz](#)
- [Jussi Parikka](#)
- [Peter Robinson](#)
- [Maureen Thomas](#)
- [Ian Cross](#)

Crucible members involved in preparing the proposal:

- [Julio d'Escriván](#)
- [Joss Hands](#)
- [Richard Hoadley](#)
- [Tom Hall](#)
- [Lionel Bently](#)
- [Jon Crowcroft](#)
- [Neil Dodgson](#)
- [Peter Tyler](#)
- [Simon Godsill](#)
- [Roberto Cipolla](#)
- [Samantha Rayner](#)
- [Isabelle McNeill](#)

- [Alyce Mahon](#)
- [Simon Schaffer](#)
- [Mary Jacobus](#)
- [Robin Boast](#)
- [John Norman](#)
- [Jim Woodhouse](#)
- [Brian Moore](#)
- [Allegre Hadida](#)
- [Mike Gregory](#)
- [Tim Regan](#)
- [Lee Wilson](#)
- [David Leitner](#)
- [John Knell](#)
- [Charles Boulton](#)

Other Crucible collaborators outside Cambridge:

- [Steve Benford](#)
- [Sally Jane Norman](#)
- [Kirk Woolford](#)
- [Scott deLahunta](#)
- [Wayne MacGregor](#)
- [Anthony Dunne](#)
- [Geraint Wiggins](#)
- [Nick Collins](#)
- [Michael Joroff](#)
- [Eileen Woods](#)
- [Giles Lane](#)
- [Adrian Woolard](#)
- [Mike Michael](#)

Proposed objectives of the hub

This research aims to invent new kinds of digital technology that help people to have rich and fulfilling lives, not simply faster and cheaper versions of the activities that they do already. People use computers, the internet and digital media not simply to do business, go shopping and fill out bureaucratic forms, but to do things they find personally meaningful and enjoyable. In fact, it is these kinds of desire - we call them digital culture - that have motivated most of the idealistic researchers who invent new digital technology. Commercial opportunities tend to come later, after businesses and governments work out how to make money from the things that motivate people to have full and enjoyable lives. This research is unusual for EPSRC, because rather than looking at the utilitarian opportunities for new technology, it investigates the imaginative cultures that motivate people to create new things. This includes looking at familiar digital media (music, film, games) in new ways, but also looking at the way that digital culture crosses boundaries into theatre, documentary and fictional writing, museums and other places of human imagination. All of these things do result in economic activity, both nationally, but also in specific places - the cities where production studios, broadcast media and technology companies attract a mix of creative artists and technical skill. However in this research we start with the people, not with the business idea. Working with research techniques from history, literature, anthropology, music and many other fields, each part of our programme looks for new ways of understanding creative and cultural experience, moving from that understanding to the invention of new digital technologies and business opportunities. This involves careful management - we have many leading technology experts involved, but we want them to hold back, rather than working in their usual way, to build on new user insights from academic disciplines that don't usually have the opportunity to influence technology change. The result will be adventurous new developments for the digital economy as a whole.

Digital currency for public good

This design project suggested by [Ella McPherson](#) explored whether blockchain techniques could be used in action against human rights abuses. Jan Kis of IMC acted as a mentor to the student team.

Design brief:

The digital currency Bitcoin uses a block chain distributed database to guarantee that any transaction can be traced to a unique original coin. The same technique could be used for anonymous authentication of a chain of custody for other kinds of data. Your task in this project is to create a secure end-to-end system for authenticated reporting and verification of organised criminal activity, corporate safety violations, governmental human rights abuses etc. You need to think about how reports can get into the system safely, and how those receiving a report can use the block chain to prove that the evidence has not been tampered with, all without endangering the whistleblower.

Undergraduate group design projects

Digital music discussion group

This group collected digital music researchers from a range of institutional affiliations, for career development and preparation of research proposals. The group pre-dated the establishment of Crucible, and provided a model for a number of Crucible working practices. In particular, although several of the members were actively involved in music research, the group intentionally met in "neutral premises" outside of any University department.

- [Alan Blackwell](#)
- [Martin Dixon](#)
- [Andrew Lovett](#)
- [Jonathan Impett](#)
- [Matt Rogalsky](#)
- [Richard Hoadley](#)
- [Bert Bongers](#)

Crucible Theme: Music technology

Digital Rosary

How can we allow people to discover or recover other courses of time, beyond or beneath the grid of the corporate calendar?

Project lead: [Barry Rogers](#)

Crucible team:

- [Leo Impett](#)
- [Alan Blackwell](#)
- [Alexander Simpson](#)

Diptych

Multi-media performance project for dance, cello and electronics, based at [Anglia Ruskin University](#), with associated observational study of the interaction dynamics between live performers in systems-based dance creation by [Jane Turner](#), and generative electronics and digital systems.

Crucible collaborators included:

- [Cheryl Frances-Hoad](#)
- [Jane Turner](#)
- [Richard Hoadley](#)
- [Tom Hall](#)
- [Satinder Gill](#)

Distributed design studio

This evaluation project was associated with the [Joint Urban Design Studio](#), working with the Martin Centre for architectural research and the MIT Urban Design Studio. Funded by the [Cambridge-MIT Institute](#), this project explored the use of technology to teach a single course in Urban Design, spanning geographic locations as well as disciplines. Seminars were taught by video-conference link between the Cambridge and MIT departments, and design project teams were composed of students mixed between

the two locations.

Project leader: Marcial Echenique

Crucible team:

- Alan Blackwell
- Rachel Hewson
- David Good
- Arlene Oak

Distributed working

The Distributed Working Project aimed to establish new ways of analysing and developing distributed teams and workgroups by bringing together theories of human communication, the sociology of work and workplace design. The project was funded by the Cambridge-MIT Institute.

Project leader: David Good and William Porter

Crucible team:

- Brendan Burchell
- Mia Gray
- Ilona Alexander
- Claudia Catacchio
- William Porter
- Michael Joroff
- Charles Kukla

Drawing at a distance

This private research project initiated by Quentin Stafford-Fraser aims to explore the potential for drawing as a communicative medium during technically mediated conversations.

Press coverage: <http://www.cabume.co.uk/software/web-cam-pioneer-working-on-new-remote-graphics-venture.html>

Crucible collaborators:

- Alan Blackwell
- Peter Robinson
- Bronac Ferran

Eco-Location

This design project for client Tim Wilkinson at the UNEP World Conservation Monitoring Centre explored ways that city dwellers can have their attention drawn to critical eco-systems.

Design brief:

Wildlife and critical ecosystems around the world include over 230,000 legal "protected areas", ranging in size from Coldham's Common in Cambridge <https://protectedplanet.net/555561770> to the Serengeti <https://protectedplanet.net/555570276>. Many people from tourists to researchers and conservationists need to know about these, but there is no quick way to find out whether you are near one. If one is nearby, what can be found there? Barren scrubland or dense forest? Could a park manager see evidence of agriculture where there shouldn't be, or a visiting scientist learn that the area has been flooded? Your task is to build a mobile application that enables the user to quickly orientate themselves with nearby protected areas, and deliver contextual data by accessing other services. You should specifically include data from the European Space Agencies Global Land Cover Layer to show the percentage of cover types within the protected area (e.g. 40% Mosaic vegetation, 60% Mosaic grassland), and you may include other information such as geolocated photos from Flickr, or species from the IUCN red list of threatened species.

Undergraduate group design projects

Emotion regulation therapies for people with cognitive impairment

This project is probing how SenseCam data can be combined with ECG data to support memory during therapies to enhance emotion regulation and support a sense of self.

Project leader: [Cecily Morrison](#)

Collaborators: Fergus Gracey, Lara Harris, Matthew Graham

Crucible Theme: [Healthcare IT](#)

Empathy and programming

A pilot study by [Stuart Wray](#) suggested a correlation between the SQ-EQ psychometric questionnaire and performance on an introductory programming course. Although unsurprising that there should be a correlation between programming aptitude and self-reported systematising tendencies, there is no need to assume that programming aptitude should also be negatively correlated with empathy.

This work is currently continuing in studies at a broader range of institutions. Collaborators include:

- [James Noble](#)
- [Craig Watterson](#)
- [Ronald Fischer](#)
- [Alan Blackwell](#)

Empirical product aesthetics

This project is developing experimental techniques to measure consumer response to the design aesthetics of a product.

Project leader: [Nathan Crilly](#)

Crucible collaborators:

- [Alan Blackwell](#)
- [David Coyle](#)
- [Paul Fletcher](#)
- [Theresa Marteau](#)
- [James Moore](#)

Energy market forecast

This design project for client Hok-Him Poon at Bloomberg provided a visualisation of potential sites for renewable energy developments.

Design brief:

The weather forecast could just as well advise you to carry an umbrella as it could advise renewable energy producers, such as wind farms, how much energy they can expect to generate. By acquiring weather information for specific regions and the locations of such power plants, this project will estimate the amount of renewable energy produced in the past, present and future, and infer practical information such as effectiveness, profitability and prospective locations for new power plants.

Undergraduate [group design projects](#)

Energy use visualisation

A series of projects have investigated the use of interactive visual representations to increase awareness of personal energy usage, understanding of how energy usage can be reduced through changes in behaviour, and interaction with machine learning algorithms to analyse, predict and control energy use.

Crucible projects:

- [Flagship Retrofit](#)
- [Readyourmeter.org](#)
- [Critical issues in interaction design](#)

Student design team projects:

- Remote energy visualisation for [AlertMe](#)
- [Energy market forecast](#) for Bloomberg

Crucible collaborators:

- [Alan Blackwell](#)
- [David Good](#)
- [William Box](#)
- [David MacKay](#)
- [Andrew Rice](#)
- [Simon Lewis](#)
- [Rory McCann](#)
- [Samuel Olatunji](#)
- [John Lawson](#)

[Crucible Theme: Energy](#)

[Crucible Theme: Motivation and behaviour change](#)

Equitable knowledge infrastructure

This strategic proposal was created by members of the [Global Challenges Initiative](#), led by [Alan Blackwell](#).

The objective is to reconfigure artificial intelligence and machine learning technologies with leadership from young African researchers.

It builds on existing programmes of work including Data Science Africa, and the Deep Learning Indaba.

Key collaborators include [Keith Breckenridge](#), [Manj Sandhu](#), [Adrian Weller](#), [Sharath Srinivasan](#), [Ella McPherson](#), [Rob Procter](#) and [Marc Deisenroth](#)

Ethics of big data

Convened by [Anne Alexander](#) of Cambridge Digital Humanities, and colleagues from the Cambridge Big Data SRI, this researcher development programme included a panel of ethics experts representing a diverse range of medical and technical approaches to ethics, who addressed a scenario constructed by Anne to raise challenging problems in both data ethics and health ethics.

Crucible collaborators:

- [Anne Alexander](#)
- [Lydia Drumright](#)
- [Claudia Abreu-Lopes](#)
- Alison Hall
- [Alan Blackwell](#)
- Martin Richards

Ethnomethodology in HCI

Historical study of the ways that Garfinkel's ethnomethodology interacted with technology design researchers.

Crucible team:

- [Alan Blackwell](#)
- [Mark Blythe](#)
- [Jofish Kaye](#)

European Storytelling Archive

Project based at Anglia Ruskin University.

[Crucible Theme: Digital Humanities](#)

Project leader: [Mick Gowar](#)

Other Crucible contributors:

- [Mark Turin](#)
- [Alan Blackwell](#)

Evolve a pet

This design project was carried out for client [Keira Cheetham](#) from Illumina, winning the prize for most impressive professional achievement in the group design project competition 2014.

Final presentation:

<https://www.youtube.com/watch?v=dH2r5uziVEk&index=2&list=PLstyePOvf2d2A3vWW4DkEGIAUIm4T0fg6>

Design brief:

The goal of this project is to create a game that teaches GCSE or A level science students about genomes and genomic sequencing. The idea is for a number of users to run evolutionary optimisations (possibly genetic algorithms) that optimally combine the favourite features of their pets - or perhaps even alien species! As with dog breeding, there may be some genetic trade-offs between functional and aesthetic attributes. Local optimisation to meet a particular user's preferences can take place on individual users' computers - perhaps mobile phones, or even Raspberry Pis. Once a desirable local optimum has been reached, users should be able to select which part of the genome to exchange with their friend's pets. Exchanges could simply take place online, but it might be more interesting to require a physical meeting - exchanging genetic material via Bluetooth, with a network cable that directly connects one Raspberry Pi to another, or some other form of ad hoc networking.

Undergraduate [group design projects](#)

Field customisation of software installations

This consultancy project for CADCentre (now [Aveva](#)) provided training for the company's engineers to help them create customised installations of their product for different client sites. The customisation facilities were based on use of the Perl language, and training focused on use of this language within a CAD data management environment.

Crucible team:

- [Alan Blackwell](#)
- [George Taylor](#)

Flagship Retrofit

The Flagship Retrofit project is trialling ways in which public housing stock in the UK can be modified in ways that reduce energy usage through a combination of design interventions and behaviour change.

Funded by the Technology Strategy Board retrofit for the future programme.

Led by [William Box](#), Carnego Systems

Crucible collaborators:

- [Alan Blackwell](#)
- [David Good](#)
- [Anthony Dunne](#)
- [Peter Landshoff](#)

Forensic speaker identification

Project within the [Undergraduate Research Opportunities Programme \(UROP\)](#), initiated by [Kirsty McDougall](#), work carried out by [Qinkan Wu](#)

A growing number of court cases involve the need to establish the speaker of some recorded speech - a hoax emergency call, a fraudulent phone transaction, an obscene voicemail, the planning of a drug deal and so on. Voices, however, are not like fingerprints. Contrary to the impression given by television shows such as CSI, there is no technique for identifying a speaker with 100% reliability. A person's voice varies,

depending on tiredness, emotion, how loud and fast he or she is speaking, and many other factors. This variability within an individual's voice makes the task of speaker identification very complicated in the forensic domain, where recordings are usually short, of poor quality and in a range of speaking styles.

The DyViS project ('Dynamic Variability in Speech: A Forensic Phonetic Study of British English') in the Phonetics Laboratory in the Department of Linguistics is carrying out research tackling these issues. The project has compiled a large-scale database of speech in different speaking styles from 100 speakers of Standard Southern British English. These recordings are being analysed to determine how well the speakers can be discriminated and what the best measures are for characterising their speech. The effects of using the telephone on an individual's speech is also being analysed.

The student project will involve developing scripts to process and analyse speech files efficiently using programs such as Praat. A background in computer programming is required, but experience in using Praat is not necessary. The exact nature of the work to be undertaken is flexible depending on the skills and interests of the student.

From creators and critics to communities

This early development project is exploring how digital technologies are changing the landscape of engagement between high-profile creative artists and their audiences. Early exploration has involved interviews with novelist Philip Pullman and choreographer Wayne MacGregor, and future work will compare their professional experiences to those of high-profile individuals in other traditional arts genres.

Crucible team:

- [Tim Regan](#)
- [Alan Blackwell](#)

From Hogwarts to hackers

Undergraduate design project creating a prototype educational programming environment for the Raspberry Pi.

The design brief was:

Many children are more interested in imaginative stories than tinkering with circuit boards. But they need not be excluded from Raspberry Pi. The goal of this project is to create a multiplayer online game, where each room of a castle runs on a different Raspberry Pi. The owner of that Pi should be able to define surroundings, objects, characters and scripted interactions (e.g. to learn spells or solve challenges) as well as visiting other player's rooms. Players get to learn about network topologies, scripting languages and command lines - but all while having sociable fun. A text adventure game might be the best choice - for example, of the kind that can be created with plot scripting language Inform7, or LambdaMOO, but you are free to attempt simple graphics or other presentation styles.

Crucible connections:

- [Jeff Patmore](#)

Undergraduate [group design projects](#)

FrontlineSMS:Radio

The Cambridge Centre of Governance and Human Rights (CGHR) is collaborating with FrontlineSMS on the development and use of FrontlineSMS:Radio to explore new communication technologies and citizen-led governance in Africa.

Project leader: [Sharath Srinivasan](#)

Crucible team:

- [Alan Blackwell](#)
- [Anne Anderson](#)
- [David Good](#)

Advisors:

- [Ken Banks](#)

Gaming and conservation

Workshop organised by [Bill Adams](#) in [Geography](#), [Chris Sandbrook](#) from [UNEP World Conservation Monitoring Centre](#) and [Bruno Monteferri](#), with funding from the [Cambridge Conservation Initiative](#).

The goal is to explore opportunities for engagement between conservationists and game developers, exploring broader issues related to the implications of gaming for many areas of the environmental movement. The workshop aims both to provide a snapshot of current games being used to promote nature conservation, and reflect on the implications of such strategies.

Subsequent to this workshop, the [Race the Wild](#) prototype was created.

Gaming technologies for anatomy education

This project in [CARET](#) explored the use of a videogame engine to visualise internal anatomy, allowing users to 'walk through' a simple 3D model of the digestive system.

- [Jonathan Mackenzie](#)
- [Gavin Baily](#)
- [Michael Nitsche](#)
- [Jem Rashbass](#)

Gender and domestic programming

This project funded by [EPSRC](#) investigated the ways in which the configuration of home technologies becomes gendered. Using a combination of anthropological and cognitive experimental approaches, the Cambridge project further developed into a PhD carried out by Jennifer under the supervision of [Paul Dourish](#).

Blackwell, A.F., Rode, J.A. and Toye, E.F. (2009). How do we program the home? Gender, attention investment, and the psychology of programming at home. *International Journal of Human Computer Studies* 67, 324-341.

Blackwell, A.F. (2006). Gender in domestic programming: From bricolage to séances d'essayage. Presentation at CHI Workshop on End User Software Engineering

Rode, J.A., Toye, E.F. and Blackwell, A.F. (2004). The Fuzzy Felt Ethnography - understanding the programming patterns of domestic appliances. *Personal and Ubiquitous Computing* 8, 161-176.

Project team:

- [Alan Blackwell](#)
- [Jennifer Rode](#)
- [Eleanor Toye](#)
- [Mark Stringer](#)

[Crucible Theme: Gender and technology](#)

Gender in open source

This policy research project funded by the [European Commission](#) investigated the experiences of women in the open source software movement, and the wider implications of those dynamics.

Policy report: http://flosspols.org/deliverables/FLOSSPOLS-D17-Gender_Policy_Recommendations.pdf

Project team:

- [James Leach](#)
- [Bernhard Krieger](#)
- [Dawn Nafus](#)

Crucible participants:

- [Marilyn Strathern](#)
- [Matt Ratto](#)

- [Alan Blackwell](#)
- [Hanna Wallach](#)

Crucible Theme: Intellectual property

Crucible Theme: Policy research

Crucible Theme: Gender and technology

Global Challenges Initiative

GCI is a Strategic Research Initiative of the University of Cambridge, originally formed as an initiative of the Cambridge [Centre for Global Equality](#) with members of the Crucible Network. GCI is dedicated to research that advances the UN Sustainable Development Goals, for the benefit of the poorer half of the world's population. GCI has a special focus on working with, and advancing the careers of, Early Career Researchers.

The core team of GCI are:

- [Lara Allen](#) - director of impact and implementation
- [David Good](#) - director of research
- [Alan Blackwell](#) - director of research
- [Sara Serradas Duarte](#) - SRI coordinator

Many other members, including advisory board and steering group members, are documented on the GCI website, which includes details of the activities of the Initiative:

<http://www.gci.cam.ac.uk/>

Graphic elicitation

Crucible members have worked on the theoretical and methodological implications of researchers using diagrams to communicate with, and elicit contributions from, interviewees. The resulting paper (Crilly, Blackwell and Clarkson, 2006) was framed with respect to other visual methods such as 'participatory diagramming' and 'photo elicitation'. 'Graphic elicitation' has since been applied in other disciplines by other researchers and has proved to be especially popular in the healthcare domain.

Reference:

Crilly, N., Blackwell A. F., and Clarkson, P.J. (2006) 'Graphic elicitation: using research diagrams as interview stimuli' *Qualitative Research*, 6(3), 341-366.

Crucible collaborators:

- [Alan Blackwell](#)
- [Nathan Crilly](#)

Groups in academia

Collaboration between [CARET](#) and [Proboscis](#), exploring the more and less transient ways that social groups coalesce and conduct themselves around the university. Changing knowledge, business and policy environments leave traces through both institutional structures, physical environments, social media and information systems. This project takes a broad design perspective with a focus on individual action and social change. Project funded by [JISC](#).

Crucible members involved in the project include:

- [John Norman](#)
- [Alan Blackwell](#)
- [Giles Lane](#)
- [Laura James](#)
- [Anne-Sophie Baets](#)
- [Verity Allan](#)

Additional input from:

- [David Good](#)

- [Nathan Crilly](#)
- [Lee Wilson](#)
- [Nancy Foster](#)
- [John Naughton](#)

Healthcare for pilgrims

Designing consultation tools for Muslims requiring healthcare during the Hajj, who do not share a common language with the staff of primary healthcare clinics in Mecca.

Crucible team and advisors:

- [Alan Blackwell](#)
- [Ben Elliott](#)
- [James Lester](#)
- [Matthias Stevens](#)
- [Paul Anderson](#)
- [Cathy Roth](#)

Local team:

- Ahmed Balkhair
- Emad Dugaither
- Imraan Munshi

History Phone

This design project for client Ina Pruegel at the [Fitzwilliam Museum](#) evaluated the use of text conversation as a paradigm for engagement with objects in museum collections.

Design brief:

There are historic objects around the Gates building that have stories to tell - if only they could speak! Imagine walking up to one of the display cases (like the one to the right of the front door), and using your phone to start a chatbot session as if you were speaking to the object itself. We will provide Bluetooth location beacons so that an Android phone can detect which object it is near. Your application should respond to questions, and maintain a conversation, with style and content that is customised to each object. The project team will have a chance to visit some of the famous museums elsewhere in Cambridge, to learn how curators design interactive content.

Undergraduate [group design projects](#)

Human participants in technology research

When technology researchers involve the broader public in their work, novel ethical issues arise - often completely unlike those of medical and biological research that guide public policy. This interdisciplinary team is constructing a guide for research with human participants in technology design and management.

Research guidance for technology researchers: <http://bit.ly/https-guide>

Kristensson, P.O. and Blackwell, A.F. (2011). Ethics in Large-Scale User Studies: Guidelines vs. Practice. Presentation at CHI 2011 Workshop on Ethics in Large Scale Trials & User Generated Content.

Project leader:

[Alan Blackwell](#)

Crucible collaborators:

- [Rob Phaal](#)
- Pat Langdon
- [Matthew Jones](#)
- [Per Ola Kristensson](#)

I-Professor

Following a design workshop hosted by CARET to explore issues related to scholarly networking, this design project for client Laura James explored the potential to automate some of the routine tasks carried out by working academics via email.

Design brief:

Most knowledge-workers (and professional scholars are no exception) have a serious struggle to differentiate routine correspondence from management of the new ideas that make the job interesting. Design an automated personal assistant that filters email, infers rules on the likely response to routine items, and looks for thematic patterns in the rest. This can be used to track research ideas, or even set up new clusters of collaboration. All rules should be customisable by the user, and confirm proposed actions before sending a message that might be harmful. After a little 'bedding-in', the customised result might be indistinguishable from a real professor.

Undergraduate group design projects

ICT, civil society and bottom-up governance

This project investigating the contribution of ICT to civil society and bottom-up governance in the developing world is an inaugural research project of the multi-disciplinary Centre of Governance and Human Rights based in the Cambridge department of Politics and International Studies. The research is directed by Sharath Srinivasan, and is being carried out in collaboration with FrontlineSMS:Radio.

Image license retrieval

This student design project completed for client John Piper at Kodak European Research explored the use of machine vision technologies to manage image licensing opportunities within a museum context.

Original design brief: "Smart Poster Picker"

Many people like to buy poster reproductions of famous artworks. This could be done by using a mobile phone to take a picture of the painting they would like to hang on their wall, and sending an MMS message to a poster distribution service. Design a system that retrieves and ranks probable matching candidates from a database of posters, based on a mobile phone image. A simple metric for matching might be the relative averages or variances of hue in each quadrant of the image. Where the photo is not good enough to provide an effective match, users should also be able to navigate through thumbnails of the available posters, arranged according to the match metric for aesthetic graphical navigation.

Improcess

Crucible Theme: Music technology

Computer programming is usually done in private, and very carefully. Live coding is a kind of musical performance where programs are written on stage, in front of an audience. Improcess is creating new tools for music programming.

Sam Aaron demonstrates early results in this video: <http://vimeo.com/22798433>

The Improcess project was initiated as an experimental application of the Cross-cultural partnership template.

Other collaborators:

- Alan Blackwell
- Ian Cross
- Richard Hoadley
- Tom Hall
- Tim Regan
- Stuart Taylor
- Jeff Rose
- Alex McLean
- Nick Collins
- Nicholas Cook

- [Julio d'Escriván](#)
- [Simon Peyton Jones](#)

Inference and direct manipulation

Initially funded by [EPSRC](#), this series of investigations has explored the opportunities to use machine learning techniques to automate mundane repetitive operations. Starting with case studies based on office work such as word-processor usage, this led to the development of Blackwell's Attention Investment framework as modelled by [Sam Staton](#), then applied to domestic automation through a programme of ethnographic and experimental investigation of home management and entertainment devices.

- [Alan Blackwell](#)
- [David MacKay](#)
- [Thomas Green](#)
- [Per Ola Kristensson](#)
- [Sam Staton](#)
- [Hanna Wallach](#)
- [Mark Stringer](#)
- [Eleanor Toye](#)
- [Jennifer Rode](#)
- [Luke Church](#)

Information systems in critical care

This project compares practices around 5 user-customisable clinical information systems use in critical care. The analysis will consider how data is produced, care coordinated, and decisions made given the customisation choices in each system.

Project leader: [Cecily Morrison](#)

Collaborators: [Alain Vuylsteke](#)

Crucible Theme: [Healthcare IT](#)

Intelligent graph reader

This design project for clients [Vivian Chan](#) and Nilu Satharasinghe at Sparrho investigated one aspect of their ongoing research programme exploring discovery of academic knowledge, in ways that might be used to extend interdisciplinary services such as [Talks.cam](#).

Design brief:

Google Scholar is a good way to find scientific results, but it only reads the words - not actual data. The goal of this project is to create document analysis algorithms that can automatically identify and describe graphs of scientific data - something like "find a graph where blood pressure decreases with age". Users should be able to feed in complete HTML or PDF documents, which are automatically parsed for graph content, and stored in an archive that supports sophisticated data queries and comparisons between graphs in different documents.

Undergraduate [group design projects](#)

Interact Artists in Industry

Funding programme initiated by [Bronac Ferran](#) at the [Arts Council of England](#), subsequent to the [New Technology Arts Fellowships](#), and art-science research fellowships with AHRC.

Local regions of England developed their own approaches to the programme, with Crucible actively involved in three placements for the East of England.

One of these was an international collaboration working with [Gordon Knox](#), director of Californian interdisciplinary arts centre [Montalvo Arts](#), and artist [Julie Myers](#) travelled to California from the UK, for a residency with Adobe Systems (locally managed by [The Junction](#)).

<http://www.interact.mmu.ac.uk/placements/host/adobe>

Rita Marcalo was a dancer appointed to a residency at GlaxoSmithKline in association with Arts & Business and EssexDance: <http://www.interact.mmu.ac.uk/placements/profile.php?artist=26>

The final grant was managed by Wysing Arts, following initial conversations with Tim Regan and Alex Taylor at Microsoft Research Cambridge that proposed a complementary technologist-in-residence to be based at Wysing.

The south-western region fellowships were coordinated by Crucible associate Kenton O'Hara, now based at Microsoft Research Cambridge.

The overall evaluation of the programme was carried out by James Leach and Samuelle Carlson.

Crucible collaborators:

- Dawn Giles
- Annette Wolfsberger
- Dipak Mistry
- Alan Blackwell
- James Leach
- Samuelle Carlson

Interaction with musical polytempi

There are many musical styles that employ polyrhythms, in which different beat patterns are superimposed (for example, superimposition of 3/4 time and 6/8 time is a simple orchestration technique that adds complexity to classical music). It is also possible to create dramatic musical effects with musical parts that are relatively faster or slower - perhaps by small amounts, such that they shift in phase over a period of time. Exploration of musical polytempi has only become possible with the use of mechanical aids, such as Conlon Nancarrow's use of player pianos, or Steve Reich's use of tape recorders.

This project created a system that allows parts to have their tempi changed dynamically by a conductor during performance, rather than simply defining set tempi for each part. A novel musical visualisation indicated the relationship between parts in terms of phase shift, allowing the conductor to vary the musical tension and resolution of subtle polytemp effects. The tempi were controlled by a gesture controlled based on a full body motion tracking system.

Nash, C. & Blackwell, A.F. (2008). Realtime representation and gestural control of musical polytempi. In A. Camurri, S. Serafin and G. Volpe (Eds), Proc. 8th Int Conf on New Interfaces for Musical Expression (NIME'08). Genova Italy June 4-8, pp. 28-33.

<http://nime2008.casapaganini.org/documents/Proceedings/Papers/209.pdf>

Crucible project team:

- Alejandro Viñao
- Alan Blackwell
- Chris Nash
- Tris Bracey

Crucible Theme: Music technology

Interactive optical tags

Design and mobile user experience project funded by Intel Research Cambridge.

Publication: <http://dx.doi.org/10.1007/s00779-006-0064-9>

Project leader: Richard Sharp

Research team:

- Anil Madhavapeddy
- David Scott
- Eben Upton
- Eleanor Toye
- Alan Blackwell
- James Scott

Interdisciplinarity and Innovation

Does interdisciplinarity lead to innovation? Many influential people believe it does, but on what evidence?. This NESTA-funded project based at [CRASSH](#) compiled a guide to research policy and best practice in Interdisciplinary Innovation.

Project Leader: [Alan Blackwell](#)

Project team:

- [Lee Wilson](#)
- [John Knell](#)
- [Charles Boulton](#)
- [Alice Street](#)

Other Crucible Collaborators:

- [Marilyn Strathern](#)
- [Mary Jacobus](#)
- [Andrew Barry](#)
- [Jochen Runde](#)
- [Mark de Rond](#)
- [David Leitner](#)
- [Catherine Hurley](#)

Workshop contributors included:

- [Geoffrey Crossick](#)
- [Geoffrey Lloyd](#)
- [Stephen Allott](#)
- [Tom Rodden](#)
- [Gunpowder Park](#)
- [Tom Inns](#)
- [Jeremy Baumberg](#)

Interdisciplinary Design Workshops

A major component within the project [Social Property and New Social Forms](#), resulting in the development of the [Blackwell-Leach Method](#).

Joint Urban Design Studio

Innovative design course funded by the [Cambridge-MIT Institute](#), jointly taught between departments of Architecture, Urban Planning and Land Economy at Cambridge and MIT. Lectures and seminars were presented by video link, and practical design classes and presentations involved joint teams of students from each institution, collaborating remotely.

A linked evaluation project assessed the use of technology, and the resulting social dynamics of the [distributed design studio](#).

[Crucible Theme: Urban design and planning](#)

[Crucible Theme: Design education](#)

LikeAudience.com

This experimental system developed by [Michal Kosinski](#) with funding from [Boeing Corporation](#) derives psycho-demographic information from the selection of things that people "Like" on Facebook.

<http://www.likeaudience.com/>

Location-based IoT discourse

The Internet of Things introduces new contexts in which we talk about technology. This project explores the ways that an ontology of place can allow new kinds of discourse between a mix of human and machine agents.

- [Saeed Aghaee](#)
- [Charith Perera](#)
- [Alan Blackwell](#)

Contributions from:

- [Paula Buttery](#)

Low literacy interaction

This interaction design project for Domino Printing Systems redeveloped the embedded user interface of one of their industrial printers so that it could be more easily operated by the immigrant and transient workers that often carry out routine production line work in food packaging plants.

Crucible team:

- [Alan Blackwell](#)
- [Jennifer Rode](#)
- [Paul Crank](#)
- [Krystyna Wojcik](#)

Making mobiles tangible

An early experiment in using built-in mobile peripherals (touch screens, cameras, bluetooth) to integrate the physical environment into interaction. This undergraduate summer project used current generation mobile products from Nokia to anticipate many features that later became the basis for mobile augmented reality applications on platforms such as the iPhone and Android.

Published results: "Tangible Interaction in a Mobile Context"

http://www.cl.cam.ac.uk/conference/tangibleinterfaces/TUIworkshop-Blackwell_Bailey_etal.pdf

Funders

- Nokia (Sami Ronkiainen)
- Boeing

Team

- [Darren Edge](#)
- [Luke Church](#)
- [Lorisa Dubuc](#)
- [Gareth Bailey](#)
- [Mattias Linnap](#)
- [Ignas Budvytis](#)
- [Vilius Naudziunas](#)
- [Vincent Chen](#)
- [Hugh Warrington](#)

Maschinist Hopkins

This 1930s opera by Max Brandt was suppressed under the Nazis, but highlights the emerging anxieties of the cybernetic age, through a chorus of worker machines reminiscent of Capek's robots. Cambridge conductor Peter Tregear, after researching the work in the course of his PhD, staged a production first in Cambridge, and then on the London Southbank in a festival devoted to music that had been suppressed. The machine chorus was represented by a live digital animation generated from audio signals captured in the orchestra.

Project leader: [Peter Tregear](#)

Crucible collaborators:

- [Alan Blackwell](#)
- [Marc Cardle](#)

Mashing up the Internet of Things

Internet-connected devices offer a wide variety of services, but defining and configuring these services introduces a new requirement for domestic software plumbing. This project in affiliation with the Hub of All Things project coordinated by Irene Ng at the University of Warwick is exploring tools that will allow end-users to create their own simple IoT applications.

Crucible team:

- [Saeed Aghaee](#)
- [Alan Blackwell](#)
- [Jon Crowcroft](#)

Memory Line

A sound installation based on interviews with members of the EDSAC team, and presented in the Cambridge Festival of Ideas. Festival events included a coding workshop, in which participants were provided with audio extracts from the original interviews, and experimented with mashing these up into spoken word musical pieces using [Sonic Pi](#).

<https://www.festivalofideas.cam.ac.uk/events/memory-line>

Project leader: [Matt Parker](#)

Crucible collaborators:

- [Alan Blackwell](#)
- [Sam Aaron](#)

MetaVision user group

Convened by Alain Vuylsteke and Matthew Jones as a combined research platform and support venue, this is a nation-wide group of representatives from those hospitals using iMDsoft MetaVision for patient record management in intensive care units.

Crucible Theme: Healthcare IT

Mobile cloud

This interdisciplinary design workshop was commissioned by France Telecom Orange Labs, and developed using the [Blackwell-Leach method](#). It explored the implications of new cloud computing infrastructure for social and commercial dynamics of interest to mobile network providers.

Crucible participants:

- [Alan Blackwell](#)
- [Charles Boulton](#)
- [David Good](#)
- [Lee Wilson](#)
- [Mia Gray](#)
- [Mark de Rond](#)
- [Tim Regan](#)
- [Anil Madhavapeddy](#)

Mobile Healthcare

This is a large-scale Cambridge initiative, sponsored by China Mobile, looking at the future of healthcare when mobile technologies are involved, especially in developing regions and the Chinese market.

Many members of the University were involved, but Crucible contributions included:

- [David Coyle](#)
- [Cecily Morrison](#)
- [David Good](#)
- [Alan Blackwell](#)
- [Alain Vuylsteke](#)

Mobile mirror shopping assistant

Student design project carried out for Clifford Dive at Qualcomm.

The original design brief was:

Some people find it extremely difficult to imagine how they might look in an item of clothing on the rails of a clothing store. We are looking for a solution that allows users to visualise themselves in particular garments and combinations thereof without the effort of multiple visits to the changing room - this visualisation will appear on their mobile phone, like an electronic Barbie doll. There are several elements to this project:

- acquisition suitable image of user
- identification of the product (bar code reader?)
- acquisition of garment image (from server side catalogue?)
- generation of combined person/garment image and display on phone

We would expect that the processing for this would be partially server based.

Mobile platform security

This consultancy project for Symbian addressed security design issues in mobile phone platforms from the broadest perspective, including human factors, business chain, software architectures and hardware.

Museums of the future

This collaboration between the Fitzwilliam Museum and the Cambridge Architecture faculty was funded by the AHRC ICT Methods Network.

Project archive: <http://moodle.expressivespace.org/>

Publication: <http://www.darwin.cam.ac.uk/dcrr/dcrr006.pdf>

Crucible collaborators included:

- François Penz
- Maureen Thomas
- Alan Blackwell
- Stanislav Roudavski
- Cecily Morrison
- Lorisa Dubuc
- Luke Church
- Andrew Lovett
- Margaret Greeves
- John Piper

Crucible Theme: Digital Humanities

Musical timbre-morphing

A programme of work initiated by composer in residence - Alejandro Viñao, this project is exploring methods by which musical sounds can be substituted, combined or resynthesised by analysis of the perception of timbre. Drawing on the experimental techniques and findings of the Virtual Violins project, this research applies spectral analysis and machine learning techniques to create new musical sounds.

Crucible collaborators:

- Alejandro Viñao
- Alan Blackwell
- Rhodri Karim
- Scott Whittaker
- Sam Aaron
- Chris Nash
- Simon Godsill
- Ian Cross

- [Nick Collins](#)
- [Frank Wales](#)

MyPersonality

Project by [Michal Kosinski](#) and [David Stillwell](#), using online personality tests to collect personality type profiles of social network users and the types of network they build. Supported by funding from [Boeing Corporation](#)

<http://www.psychometrics.cam.ac.uk/page/255/mypersonality.htm>

<http://www.mypersonality.org/>

Ndiyo

Project initiated by [Quentin Stafford-Fraser](#), to develop a very low cost computing platform suitable for use in low income and remote locations in the developing world. The technical platform became a basis for the Cambridge startup [CamVine](#).

Crucible connections:

- [Seb Wills](#)
- [Aptivate](#)

New Century Cities

This collaboration with MIT, originally funded by the [Cambridge-MIT Institute](#), spanned technology research, public policy, urban planning and social science, to understand how we are building new cities, settlements and communities in locations such as Media City UK. The project was oriented to policy intervention, with workshops held in London and elsewhere, focusing on extremely large scale urban planning programmes.

Leading to [Media City UK](#)

Connected to the [Architectural ethnography](#) project.

Collaborators:

- [David Good](#)
- [Michael Joroff](#) (MIT)
- [Peter Tyler](#)
- [Dennis Frenchman](#) (MIT)
- Alexis Sanyal

Other contacts:

- [Carlo Ratti](#)

[Crucible Theme: Policy research](#)

[Crucible Theme: Urban design and planning](#)

New Technology Arts Fellowships

This series of fellowships was funded by the [Arts Council of England](#), by the [Cambridge-MIT Institute](#) and by the [Kettle's Yard](#) artist fellowship programme, as a pilot programme for a larger scale national series of [art and science research fellowships](#). It was managed by Crucible with [The Junction](#), and included residential and workshop meetings at [Wysing Arts](#).

Exhibition at Kettle's Yard: <http://www.kettlesyard.co.uk/exhibitions/archive/newtech.html>

Arts projects led by:

- [Simon Biggs](#) and [Eugene Terentjev](#)
- [Alexa Wright](#) and [Rana El Kaliouby](#) with [Alf Linney](#)
- [Mark Palmer](#) and [Jonathan Mackenzie](#)

Other crucible collaborators:

- [Lizzie Muller](#)
- [Rachel Hewson](#)
- [Alan Blackwell](#)
- [Bronac Ferran](#)
- [Michael Harrison](#)
- [James Leach](#)
- [Scott deLahunta](#)
- [Anne Roberts](#)

Next-generation museum guide

Student design project for client [David Scruton](#) at the [Fitzwilliam Museum](#), using [Hypertag](#) technology.

Original design brief was:

Visitors to the Fitzwilliam Museum in Cambridge can currently use a handheld eGuide, deployed on PDAs with location sensing infrastructure from local company Hypertag. Your task is to design a next-generation guide aimed at an audience of eight-year olds. The device should enable users to guide the rest of their family around the Museum during their visit. It should also allow users to construct a thematic story inspired by a selection of museum objects. By combining the user's narrative with multimedia material, the system will automatically generate a personalised (HTML-based) videogame that users and their friends can later play online.

Online aerospace clubs

Partnership initiative by [Boeing Corporation](#), using online tools to create networks of student innovators, who work in teams to solve contemporary aerospace challenges. Deployment of the initiative in the People's Republic of China was evaluated by a team including [Michal Kosinski](#)

Collaborators:

- [Michal Kosinski](#)
- [Deborah Radasch](#)
- [David Good](#)
- [Alan Blackwell](#)

[Crucible Theme: Design education](#)

Online inter-faith dialogue platform

This project funded by [EPSRC](#) under the Digital Economy Programme Research in the Wild initiative, is directed by [Mike Highton](#) in the Faculty of [Divinity](#). Building on the Scriptural Reasoning approach that has been created by the Cambridge Inter-Faith Programme for facilitating encounters between different faith communities, this online project is developing a platform for multi-language (English, Hebrew and Arabic) discussion of texts, with commentary and discussion facilitated by rapid machine-aided translation. The technical platform for the project is derived from the Meedan platform for Arabic-English dialogue.

[Digital humanities \(Crucible theme\)](#)

Online sentiment and happiness

Automated sentiment analysis can identify broad trends in the satisfaction of people posting status updates on social networking platforms. This student project explored correlation between online sentiment, and changes in gross national happiness indices.

Collaborators:

- [Ning Wang](#)
- [Michal Kosinski](#)
- [Simone Schnall](#)

Palimpsest

An experimental image manipulation tool, supporting open-ended creative exploration through a live purely-visual constraint language.

Project leader:

- [Alan Blackwell](#)

Collaborators included:

- [Sam Aaron](#)
- [Luke Church](#)
- [Issam Kourbaj](#)
- [Beryl Plimmer](#)
- [Meredydd Williams](#)
- [Ignatios Charalampidis](#)

Publications:

- <http://www.cl.cam.ac.uk/techreports/UCAM-CL-TR-833.html>
- http://www.sussex.ac.uk/Users/bend/ppig2014/18Appig2014_submission_11.pdf
- <http://authors.elsevier.com/sd/article/S1045926X14000627>

Parsing life drawings

This project carried out by student Tom Jacques analysed data collected in a life drawing class where students were given the opportunity to create drawings using the paper-simulating greyscale paint package ~~Sketcher~~.

Sketcher maintained log files of every stroke made during the drawing process, allowing the drawing to be "replayed", but also supporting parsing of the strokes, for example to distinguish between shading gestures and boundary or line definition gestures.

Crucible collaborators:

- [Alan Blackwell](#)
- [François Penz](#)

Party Line Detection

This undergraduate group design project (competition winner in 2010) provided a live visualisation of content analysis from Twitter feeds of political candidates in the 2010 UK general election. The system was live during the election at www.tweetguv.co.uk

Design brief: New online 'social media' products become political tools almost as soon as they are released. But not all politicians realise that online content is more dangerous than traditional party newsletters, because it can be analysed automatically. Your task is to apply the Twitter API to analyse whether UK politicians are showing independent thought when they use Twitter, or are simply following the party line. Are they addressing the same issues as others in their party, perhaps simply reusing material from press releases? Or are they adopting ideas from the opposition agenda? Your system should provide voters with a clear summary and trend analysis, perhaps using visualisations of the kind that are shown on TV on election nights.

Passive airflow comfort control

This student design project carried out for [Steve Basford](#) from [Grant Instruments](#).

Original design brief:

The student workstation area in the Gates Building is subject to substantial variations in temperature and humidity. Your task is to design an environmental control system that will monitor and predict changing comfort levels. This should be done sufficiently accurately that corrective action can be taken before conditions become too extreme for passive airflow modifications to be effective. You will use a Squirrel environmental datalogger, with sensors to record current environmental conditions and count the number of people entering and leaving. Based on your recordings of the effects of occupancy and incident

sunlight, you should develop a predictive model that will then be used to regulate conditions by managing airflow (opening and closing the external doors) on the final project demonstration day.

Crucible Theme: Sustainability

Patterns of user experience

This study compared the way that architects think about the user experience of buildings, to the way that programmers think about the user experience of software. Christopher Alexander's work on 'pattern languages' has been influential in both fields, but we suggest misinterpreted within the software industry/

Publication: <http://www.cl.cam.ac.uk/~afb21/publications/BlackwellFincher-PUX.pdf>

Crucible collaborators:

- [Alan Blackwell](#)
- [Sally Fincher](#)

Pension understanding

This consultancy project explored the relationship between statistical reasoning and personal life choices, when people are making decisions about their financial futures. It resulted in design and evaluation of a new website and service offering for a client in the financial services sector.

Project leader:

[John Coates](#)

Crucible team:

- [David Speigelhalter](#)
- [David Coyle](#)
- [Alan Blackwell](#)

Crucible Theme: Motivation and behaviour change

Performance capture

Funded under the CREATOR network, this project was a collaboration between the University of Cambridge Computer Laboratory, Culture Lab Newcastle, the University of Southampton School of Management, and the department of Media and Film at the University of Sussex. It explored the use of motion capture technology in a performing arts context, and also explicitly investigated the metaphorical connection to how value is "captured" in collaborations of this kind.

Crucible Theme: Reflective practice

Collaborators:

- [Lorraine Warren](#) (Southampton)
- [Sally Jane Norman](#) (Newcastle)
- [Kirk Woolford](#) (Sussex)
- [Peter Robinson](#)
- [Alan Blackwell](#)
- [Chris Nash](#)
- [Ian Davies](#)
- [Daniel Bernhardt](#)

Performance Programming

Performance programming: digital and generative dance, music and art

This public performance at the Cambridge Science Festival took place in the William Gates Building on Saturday 23 March 2013.

Computers always follow rules, and people sometimes do. Can following rules be creative? This live performance experimented with technical and compositional rules, including live coding of music (Sam

Aaron) and generative dance (Jane Turner). The event included a 20 minute performance, technical demonstrations of new digital arts technologies and audience discussion with the performers.

Collaborators:

- [Sam Aaron](#)
- [Jane Turner](#)
- [Alan Blackwell](#)

Assistance from:

- [Isak Herman](#)
- [Zhen Bai](#)
- [Rachel Drury](#)

<http://www.cam.ac.uk/sciencefestival/events/?uid=a3da3961-0450-488b-87b1-bbdd90387ae3&date=2013-03-23>

Performing with Gadgeteer

The Gadgeteer system was created in [Microsoft Research Cambridge](#), as a tool that allows non-specialists to easily create programmable hardware assemblies. This research workshop involved a range of musicians, artists and programmers who spent a day at [The Junction](#) building performance interfaces with the recently released Gadgeteer components.

Workshop convened by [Stuart Taylor](#) and

Crucible participants:

- [Tim Regan](#)
- [Alan Blackwell](#)
- [Sam Aaron](#)
- [Jonathan Hook](#)

[Crucible Theme: Music technology](#)

[Alan Blackwell Research Theme: End-User Development](#)

Phone programming for children

This design project explored educational opportunities for educational engagement with mobile technology platforms.

Design brief:

Design a programming language suitable for use by children, with a sufficiently compact user interface that the development environment can be run on a mobile phone. Children should be motivated to use this language to develop applications that are useful and of interest to them - it shouldn't be like school! The Android platform will be used.

Undergraduate [group design projects](#)

[Crucible Theme: Educational technology](#)

Process plant exploration

This student design project was carried out for [Jonathan Boardman](#) from [Aveva](#). The objective was to explore the APIs of Aveva's process plant design product, by designing a more playful approach to interaction with the plant model, inspired in part by the [gaming technologies for anatomy education](#) project carried out at [CARET](#).

Original design brief: "Pipe Dreams"

Design an online fantasy game in which players compete to reach items of treasure inside a three-dimensional maze of pipes and tanks. The display need not be three dimensional (it might use 2-D perspective renderings of the pipe interiors), but should give advice on which players have the best chance of reaching each treasure, based on speeds with which players can run around corners of varying radius, climb ladders versus sliding down, etc. Although players only see the inside of the maze, you can

create a 3-D visualisation for use by a Game Master, by exporting the whole maze description to the rendering engine used in the Aveva prouct range.

Programming as craft

An exploration of programming as a craft discipline, based on interviews with the director of the Craft Council, and with leading artist-programmers. The results were framed in terms of Agre's notion of a Critical Technical Practice. This project was funded within the CREATOR network of projects.

Publication: <http://dx.doi.org/10.1162/leon.2010.43.2.202>

Collaborators:

- [Alan Blackwell](#)
- [Kirk Woolford](#)
- [Sally Jane Norman](#)
- Cecile Chevalier
- [Nick Rothwell](#)
- [Marc Downie](#)

Programming for artists

This student design project was carried out for client [Robert Aish](#) at [Autodesk](#).

The original design brief was:

Seymour Papert's Logo, Steven Tanimoto's Pixel Calculator, and John Maeda's Design By Numbers have all tried to teach basic computational concepts by focusing on image manipulation. Your task is to design a new educational language, suitable for use by first-year art or architecture students. Your system should offer a sufficiently engaging aesthetic experience to keep art students interested at least until they have acquired the concepts in the introductory sections of your own Java course. (You don't have to use Java syntax.)

Project Darknet

This design project was carried out for client Russell Bender at Potential Difference

Design brief:

"Darknet" is a new experimental theatre production under development by a Cambridge graduate for performance next year. It explores computer hacking, cyber espionage and cyber warfare and aims to give the audience an experience of the dark side of internet use. We're not sure if this is legal*, but we've been thinking that we might use data from the theatre ticket booking system to mess with their minds at some point during the show and make them feel like they have been hacked. Your job is to build a system that helps us do this by any means you can think of. You can assume that there will be a data projector built into the set or lighting design, that there's a sound system, that we can change the script, and we can ask the audience to leave their phones on ... we have their numbers (and also their seats)! It's up to you to create effects that will take the story somewhere a little creepy

Undergraduate [group design projects](#)

Public value from technology in the arts

Funded by the AHRC [ICT Methods Network](#) and the [Arts Council of England](#), this event explored the kinds of public value that arise when technology is used in arts practice and research. In a two day event, one day was devoted to issues around academic arts and humanities research ([Crucible Theme: Digital Humanities](#)), and the other to new media and digital arts practice.

Event archive: <http://www.crassh.cam.ac.uk/events/196/>

Project leaders:

- [Lee Wilson](#)
- [Alan Blackwell](#)

Crucible collaborators:

- [Dawn Giles](#)
- [Annette Wolfsberger](#)
- [John Knell](#)
- [John Holden](#)
- [Mary Jacobus](#)
- [Catherine Hurley](#)
- [Peter Tyler](#)
- [David Robey](#)

Crucible Theme: Policy research

Race the Wild

Undergraduate design project creating a prototype for [Craig Mills, United Nations Environment Programme World Conservation Monitoring Centre](#)

The design brief was:

The UNEP-World Conservation Monitoring Centre wants to improve public engagement with wildlife conservation. One very successful approach is to help those interested in wild animals to learn more about their daily activities, and to imagine the environments that the animals have to survive in. The goal of this project is to create a game that runs on a mobile phone platform, allowing players to compare their own movements to those of wild animals that are fitted with satellite tracking devices. You are free to design a game scenario in any genre that makes use of play location data and animal tracking information.

Crucible connections:

- [Chris Sandbrook](#)

Undergraduate group design projects

Re-use of clinical data

The ReCliC project was funded by the [Health Foundation](#) to explore whether and how data from electronic health records can be used to inform and improve clinical practice.

Crucible team included:

- [Matthew Jones](#) (PI)
- [Alan Blackwell](#)
- [Alain Vuylsteke](#)
- [Karl Prince](#)
- [Sallyanne Meakins](#)
- [Alexander Simpson](#)
- [Maria Gorinova](#)

Reactive materials in public art

This project was funded by AHRC in cooperation with the Arts Council of England, and developed as a continuation of one of the [New Technology Arts Fellowships](#).

The goal of this project was to research and develop new reactive materials based on liquid crystal elastomers for application in interactive objects and, ultimately, architectural environments, collaborating with research scientists in relevant fields including physics, mechanical engineering, chemical engineering and computing. The whole was contextualised through an existing programme of social science research investigating creativity and the role of interdisciplinary collaboration in society.

Crucible team:

- [Simon Biggs](#)
- [Alan Blackwell](#)
- [Eugene Terentjev](#)
- [James Leach](#)
- [Sergio Pellegrino](#)

ReadYourMeter.org

This was an early experiment encouraging people to monitor and compare their energy consumption. It emphasised comparisons between personal energy consumption at home and at work, and also provided graphs to visualise comparisons between groups of friends, or between different time periods in their own house, in response to experimental changes.

The site was still live on 21 July 2011: <http://www.readyourmeter.org>

ReadYourMeter.org was used as a case study for a workshop on the application of contemporary critical philosophy to technology design:

<http://sites.google.com/site/designcriticism/home>

Collaborators:

- [David MacKay](#)
- [Alan Blackwell](#)
- [Andrew Rice](#)
- [Luke Church](#)
- [Ian Davies](#)
- [Mark Blythe](#)
- [Jeff Bardzell](#)

The project was staffed by undergraduates who spent a summer implementing the main site, together with a set of interfaces to Cambridge University energy monitoring systems.

Research team:

- [Pete Calvert](#)
- [Ravi Raja-Rayan](#)
- [Dan Ryder-Cook](#)

Representing Knowledge: Exploring Computational Techniques

This 2002 meeting at [CRASSH](#) was convened by [Colin Shell](#) (Archaeology) and [Mel Leggatt](#).

The meeting concluded that there was an urgent need for a "Cambridge media laboratory", and the CRASSH annual report records that founding CRASSH Director [Ian Donaldson](#) "undertook to co-ordinate efforts to achieve this goal". Work toward that end is now focused in the [Cambridge Digital Humanities Initiative](#).

<http://www.crassh.cam.ac.uk/oldwww/centre/annualrep02.html>

Contributors included:

- [Colin Shell](#)
- [Corinne Roughley](#)
- [Chris Evans](#) (work undertaken with [Caroline Humphrey](#))
- [Spike Bucklow](#)
- [Mel Leggatt](#)
- [Barbara Ravelhofer](#)
- [Robert Haining](#)

[Crucible Theme: Digital Humanities](#)

Returning to online locations

This project led by [Natasa Milic-Frayling](#) at [Microsoft Research Cambridge](#) explored the mental models that people have of the "back" button on their web browser. A range of alternative visualisations were created and evaluated, leading to a proposal for an smart version of the back button that is dynamically informed by people's browsing behaviour.

Publication: Milic-Frayling, N., Jones, R., Rodden, K., Smyth, G. Blackwell, A.F. and Sommerer, R. (2004). SmartBack: Supporting users in back navigation. In Proceedings of the Thirteenth International World Wide Web Conference (WWW2004), pp. 63-71.

Project team:

- [Natasa Milic-Frayling](#)
- [Kerry Rodden](#)
- [Rachel Jones](#)
- [Gavin Smyth](#)
- [Ralph Sommerer](#)
- [Alan Blackwell](#)
- [Paul Crank](#)
- [Krystyna Wojcik](#)

Road-pricing game

This design project supervised by client [Steve Platt](#) from Cambridge Architectural Research provided an initial feasibility study for an interactive game that could be used for policy education related to road pricing.

Project led by [Nichola Harrison](#)

Other Crucible collaborators:

- [Ying Jin](#)
- [David Griffiths](#)
- [Perry Walker](#)
- [Steve Denman](#)

Design brief:

It's hard for voters and taxpayers to assess what impact different funding policies will really have on their lives. The goal of this project is to create an online game that will enable users to explore issues of transport funding and, in particular, to measure their personal costs and benefits from road pricing. An underlying model provided by the Cambridge Centre for Smart Infrastructure and Construction can be used to simulate the key features of the Cambridge transport network, with users plotting a number of their typical journeys to create a baseline. They will then be given the opportunity to "purchase" benefits in the form of a range of transport infrastructure and service improvements, for example road quality and public transport. According to the choice of benefits made, the user will incur a variable mileage-based road user charge, whose proceeds are available for spending on transport. Making changes in travel behaviour - for example making a journey by bus or bicycle rather than by car - will allow the user to reduce or avoid the charge. The model will also allow users to opt for a reduced rate of charge and/or a compensating reduction in fuel duty, with a personalised benefit-cost ratio compared to other players.

[Undergraduate group design projects](#)

Safer social media

Undergraduate design project initiated by [David Kynaston](#)

The design brief was:

Young people with learning disabilities such as Down's Syndrome, ADHD or dyslexia are increasingly excluded from social media opportunities. Your goal in this project is to create a new front end for Facebook (using the Facebook API) to provide a straightforward set of social functions optimised for users who have very limited ability to use text in any form. Rather than the single-user mode of typical Facebook usage, it is also likely that a parent or carer may need to assist or review interactions. Your design should take account of this in a sensitive manner, including considerations of privacy and vulnerability

[Undergraduate group design projects](#)

Scanning and feedback from chemical structures

Student design project for clients [Matt Segall](#) and [Ed Champness](#) from Optibrium.

Design Brief:

Computational predictive models that can generate results in fractions of seconds are used in the design

of new medicines (e.g. <http://www.optibrium.com/stardrop/stardrop-glowing-molecule.php>). In addition, many databases exist containing further data about previously synthesised molecules. However, this information can only be predicted or recalled for molecules for which the chemical structures are stored on a computer in some form. Chemists regularly have 'visual access' to molecule structures (papers, meeting presentations, notebooks) with no option but to make a copy and then 'draw' the molecule into their computer at a later time if they wish to find out more information. Your challenge is to design and prototype a method by which a chemist with visual access to a molecule structure can find out information about a molecule within seconds of seeing it, giving real-time feedback to spot potential new medicines.

Science Non-fiction and the Bottom Billion

Seminar series hosted by [CRASSH](#), organised by [Lara Allen](#), [Alan Blackwell](#), [Bhaskar Vira](#) and [Rob Doubleday](#)

Crucible members who contributed as speakers included [Karl Prince](#), [Manj Sandhu](#), [Derek Smith](#), [Chris Sandbrook](#)

<http://www.crassh.cam.ac.uk/programmes/science-non-fiction-and-the-bottom-billion>

Seamful museum experience

Location-based services in museum guides often focus either on visit planning, or on the delivery of content targeted to a specific room, exhibit case or object. This project used a new generation of low power Bluetooth beacons to explore the interpretation of Seamful Computing in the museum context. The result was an interactive game in which ghosts inhabit parts of a museum and encourage Cambridge visitors to make connections between the collections of different museums.

Crucible team:

- [Tommy Nilsson](#)
- [Carl Hogsden](#)
- [David Scruton](#)
- [Alan Blackwell](#)

With technical assistance from:

- [Saeed Aghaee](#)
- [Charith Perera](#)
- [Ramsey Faragher](#)
- [Rob Harle](#)
- [Dan Pemberton](#)

Seeing big data

This project is investigating the way in which people explore statistical data, and the potential of interactive visual representations to be used in combination with machine learning algorithms to provide mixed-initiative data analytics systems, in which people can share hypotheses or hunches that are informed by big data.

Crucible team:

- [Advait Sarkar](#)
- [Alan Blackwell](#)
- [Mateja Jamnik](#)
- [Martin Spott](#)

[Visual representation \(Alan Blackwell's research theme\)](#)

[Crucible Theme: Design agency and intent](#) (in mixed-initiative systems)

Shared agency in computer use

Conventionally, research into agency investigates cases in which individuals either do or do not direct their own actions.

In new generation computer interfaces, for example those that use machine learning techniques to infer the user's intentions (e.g. example-based programming), the agency is shared between user and computer. If the computer is interpreted as having agency, does the user attribute this to the computer itself as an autonomous actor, or to the system designer as a remote agent for which the computer acts as a deputy or representation? (Links to Nathan Crilly's research in [Design intent](#))

In this project, we are carrying out experiments to assess the ways in which changes in the balance agency are perceived during routine mouse interaction tasks, using controlled experimental techniques from neuroscience.

Project lead:

- [David Coyle](#)

Collaborators:

- [James Moore](#)
- [Paul Fletcher](#)
- [Per Ola Kristensson](#)
- [Luke Church](#)
- [Nathan Crilly](#)
- [Alan Blackwell](#)

[Crucible Theme: Design agency and intent](#)

Social Property and New Social Forms

This project explored some of the prerequisites for creative and interdisciplinary collaboration, investigated through colloquia and interdisciplinary design workshops. Outcomes from the project included the [Blackwell-Leach Method](#) for facilitating interdisciplinary design workshops.

Project leader:

- [Marilyn Strathern](#)

Key publications:

Strathern, M. (2004). Commons and borderlands: Working papers on interdisciplinarity, accountability and the flow of knowledge. Wantage: Sean Kingston Publishing.

Barry, A., Born, G., & Wieszkalnys, G. (2008). Logics of interdisciplinarity. *Economy and Society*, 37(1), 20-49.

Crucible members in project team:

- [Andrew Barry](#)
- [Georgina Born](#)
- [James Leach](#)
- [Alan Blackwell](#)
- [Samuelle Carlson](#)
- [Elena Rockhill](#)
- [Lorenzo Wood](#)

Social Sensing

This research workshop explored the convergence of new personal sensing and communications technologies in mobile platforms with social science concerns in technology research.

Project leader:

- [Cecilia Mascolo](#)
- [Jason Rentfrow](#)

Crucible participants included:

- [Michal Kosinski](#)
- [David Coyle](#)
- [David Good](#)

- [Alan Blackwell](#)

Software design for videogames

Consultancy project for [Sony Computer Entertainment Europe](#), training SCEE staff in new design practices appropriate to the object-oriented software development tools and graphics processing capabilities developed in advance of the launch of the Playstation 2.

Sonic Pi

With funding from the [Raspberry Pi Foundation](#), this project developed an experimental school curriculum for teaching programming through the medium of digital music. Using the Raspberry Pi as a standalone music synthesis engine, students can connect a keyboard and screen to define their own programs expressing musical structure. In the process, they acquire a range of fundamental computer science concepts and basic programming skills. Curriculum development and a pilot series of lessons were created in collaboration with a school in a low-income area of East London.

Project leader:

[Sam Aaron](#)

Linked Crucible projects:

[improcess](#) - [Ian Cross](#), [Julio d'Escrivan](#), [Richard Hoadley](#), [Tom Hall](#), [Nicholas Cook](#), [Simon Peyton Jones](#), [Tim Regan](#), [Chris Nash](#), [Jenny Judge](#), [Nick Collins](#)

[Sonic Pi Live and Coding](#) - [Rachel Drury](#), Daniel Brine, Pam Burnard, Michelle Brace, Franzi Florack, Michael Corley, Steph Hogger, Martin Russell, Matthew Gunn, Juneau Projects, Pop-Pi video artists, Ben, other teachers

[Defining Pi](#) - Rachel Drury, Nicola Buckley, Gareth Bell-Jones, Chooc Ly Tan, Kate Owens, Rob Smith, Richard Healy

Computer Lab Advisors:

- [Alan Mycroft](#)
- [Robert Mullins](#)
- [Andy Rice](#)

Raspberry Pi Foundation

[Eben Upton](#), [Liz Upton](#), [Philip Colligan](#), [Lance Howarth](#), [Carrie Anne Philbin](#), [Alex Bradbury](#), [Jack Lang](#), [Andy Hopper](#), [Alan Mycroft](#), [David Cleeveley](#), [Alan Mycroft](#), [Robert Mullins](#)

- Other funders and donors

[AHRC](#), [NESTA](#), [Arts Council of England](#), [Pi-Hut](#), [Moog](#)

Performance collaborators

- Ben
- Jonathan Graham
- Afrodita Nikolova
- Organ: Alex Coplan
- Piano:

Research communities

Dagstuhl seminar on Learning in Live Coding - Alex McLean, Julian Rohrerhuber, Alan Blackwell, James Noble

AHRC Live Coding Research Network - Alex McLean and Thor Magnusson

The TOPLAP manifesto authors, including Alex McLean, Nick Collins, Julian Rohrerhuber and others

Students who have worked with Sonic Pi in the Computer Lab

[Giovanna Dimitri](#), [Alexander Simpson](#), [Emily Fox](#), [Biko Agozino](#), [Karolis Dziedzic](#), [\[\[Ruairi Dorrity\]](#), [Mona Niknafs](#), [Janie Sinclair](#), [Alistair Stead](#)

Sonic Pi: Live and Coding

This multi-partner project led by [Cambridge Junction](#) is creating an adventurous new music technology curriculum for schools, based on the [Performance Programming](#) practice of Live Coding. Partners include [Raspberry Pi Foundation](#) and [Juneau Projects](#). The project is funded under the [NESTA, Arts Council of England](#) and [AHRC](#) programme Digital R&D for the Arts.

Crucible team:

- [Daniel Brine](#)
- [Sam Aaron](#)
- [Pam Burnard](#)
- [Franzi Florack](#)
- [Rachel Drury](#)
- [Alan Blackwell](#)

Sound Garden

This project explored the potential for a site-specific sound installation that would demonstrate algorithmic music synthesis seeded by the path that visitors take through a formal garden. The ultimate objective is to create an installation that could be showcased at the Dagstuhl centre for computer science research, building on the Dagstuhl seminar on live coding.

This Cambridge project was carried out in collaboration with client Jonathan Baldwin from Madingley Hall, where there is a beautiful formal garden. Proximity triggers were created using Bluetooth low-energy beacons from [CSR](#)

Design brief:

Surprisingly satisfying music can be defined in terms of simple regular grammars. Simple grammars can be derived from observing the traversal of a graph. Your task is to make a system that automatically generates original music, according to rules that are derived from the path of visitors walking through the formal garden at Madingley Hall (<http://goo.gl/maps/9utLI>). A small number of infrared detectors hidden in the flowerbeds will detect people passing. A Raspberry Pi should use these signals to create a grammar that can also be viewed and modified by members of the public, in the form of source code (any language – or your own invention) that can be edited from any web browser via an HTTP server on the Raspberry Pi. Of course, everyone should be able to hear the resulting music, whether played over speakers in the garden, or by remote viewers from their browsers. As an example of the kind of generative music that might result, check out the video of Dave Griffiths' techno music composing robots in al-jazari.

Undergraduate [group design projects](#)

SoundCodr graphic score interpreter

SoundCodr is a system created by [Alistair Stead](#) during his MPhil in Advanced Computer Science. It allows users to build a graphic score interpreter that runs on a mobile phone, interpreting coloured pen drawings on a white board and converting them into music synthesis control parameters. Users can define their own novel music notation, then create a score and play it by pointing the mobile phone camera at their drawing.

Video of SoundCodr in use: <http://www.youtube.com/user/alistairstead#p/u/3/UUllAv6eZlY>

Crucible collaborators:

- [Alan Blackwell](#)
- [Sam Aaron](#)
- [Luke Church](#)

[Crucible Theme: Music technology](#)

Statistical persuasion authoring

This student design project was carried out for client [Simon Geard](#) at [CAD Schroer](#)

Original design brief:

A well-presented statistical argument is very valuable. Many politicians, policy makers and members of the public find it hard to understand risk factors, likelihood, and what the priorities for action should be in an uncertain world. But Al Gore's film *An Inconvenient Truth* showed the power of well-designed statistical graphics. Web sites like <http://www.gapminder.org/> help people explore political and economic statistics, and sites like <http://www.understandinguncertainty.org/> help people understand statistical principles through animations of risk data. But it is hard for regular people to create sites like these (it usually involves a lot of Flash programming). Your task is to create an authoring tool that helps people communicate statistical arguments by creating interactive online graphics. They might get help to structure the arguments, as in <http://compendium.open.ac.uk/>. They should also be able to collect their own data from online sources, for example using data mashup tools like Yahoo Pipes.

Strategy roadmaps

How are visual "roadmaps" integrated into the practices of strategic management? The study of this widespread phenomenon integrates questions of graphic design, small group collaboration, communication studies and organisational management.

Project leader: Rob Phaal (Manufacturing Engineering)

Crucible collaborators:

- Nathan Crilly
- Alan Blackwell
- Martin Eppler (media and communication management)

Crucible network participants:

- Brock Craft
- Clive Richards

Blackwell, A.F., Phaal, R., Eppler, M. and Crilly, N. (2008). *Strategy Roadmaps: New Forms, New Practices*. In G. Stapleton, J. Howse and J. Lee (Eds) *Diagrammatic Representation and Inference, Proceedings of 5th International Conference (Diagrams 2008)*. Lecture Notes in Artificial Intelligence LNAI 5223. Berlin: Springer Verlag, pp. 127-140.

R.A. Burkhard, G. Andrienko, N. Andrienko, J. Dykes, A. Koutamanis, W. Kienreich, R. Phaal, A. Blackwell, M. Eppler, J. Huang, M. Meagher, A. Gr n, S. Lang, D. Perrin, W. Weber, A. Vande Moere, B. Herr, K. B rner, J.-D. Fekete and D. Brodbeck (2007). *Visualization Summit 2007: ten research goals for 2010*. *Information Visualization* (2007) 6, 169-188.

Super-influencers on social networks

Which people in a social network set the trends and influence those around them? This project explored automated methods of identifying the contributors who shape idea spaces.

Collaborators:

- Michal Kosinski
- Cecilia Mascolo
- Jason Rentfrow

Survey coding in Somali

Development of the Coda tool for use by Africa's Voices Foundation, a Chrome extension designed for use by Somali-speaking researchers and translators carrying out large-scale qualitative coding of survey data collected in Somalia.

Funded by the Global Challenges Research Fund.

Crucible team:

- Luke Church
- Alan Blackwell
- Sharath Srinivasan
- Ana Semrov
- Guy Emerson

Symbolic play in augmented reality

This project is exploring the ways in which augmented reality (AR) supports an overlaid symbolic interpretation of the physical world. Symbolic play is an important developmental progression in early childhood, leading to social skills and broader intellectual development. Some aspects of symbolic play can be disrupted in conditions such as autism spectrum disorders, and the frequent attraction of computer systems for children with these disorders suggests an approach to encouraging and facilitating symbolic interpretation in play.

- [Zhen Bai](#)
- [Alan Blackwell](#)
- [George Coulouris](#)
- [Nicola Yuill](#)

Talks.cam

talks.cam is a pioneering initiative encouraging interdisciplinary collaboration through improved awareness of related research throughout Cambridge. (It includes, of course, a series of debates and seminars on interdisciplinary design).

We recommend talks.cam as a model of grass-roots system development, applying user-generated content approaches to bypass the institutional obstacles to cross-boundary working.

talks.cam was initially developed in PHP by [Phil Cowans](#), then re-engineered by [Tom Counsell](#) using Ruby on Rails, and is now hosted by [CARET](#). System design was carried out by [David MacKay](#), [Alan Blackwell](#), Mike Rose and [Duncan Simpson](#).

The system is increasingly being deployed at other Universities, including Imperial College London, and Oxford University.

Live system accessible from: <http://talks.cam.ac.uk/>

Taxonomic inference

Species taxonomists make expert categorisation judgments based on their experience working with collections of specimens. Many machine learning systems for automated inference have a similar objective, but are not usually developed in direct collaboration with knowledge communities built around taxonomic expertise and methods.

The goal of this project is to develop a new experimental system for automated classification of fossil and insect photographs into species, based on machine learning / artificial intelligence techniques. Funded by the [Natural History Museum](#), the initial work has been carried out within the [Undergraduate Research Opportunities Programme \(UROP\)](#).

Collaborators:

- [Norman MacLeod](#)
- [Ben Glocker](#) at [Microsoft Research Cambridge](#) and
- [Tom Whitehead](#) an undergraduate engineer at Cambridge University.

The approach chosen is to develop a supervised learning system using the Random Forest Classifier algorithm. We will aim for the software to be easily extensible and reconfigurable so that a variety of changes can be made at a later date. The results achieved with this approach will be compared to those for the existing system (called DAISY) which is based on the Plastic Self-Organising Map (PSOM) algorithm.

Initial approach

In the early stages of this project we are focusing primarily on three data sets. These are wasp heads, UK butterfly species and forams. The system currently uses colour, texture, pattern and a small amount of shape information to generate the binary trees.

We are currently attempting to use a single image (a non linear combination of the training images) from each class to automatically split test images into separate components. We are also expanding the variety of tests that can be applied to images at nodes within the binary trees.

System Components

The basic components of the system are:

Random Forest. The random forest is a collection of binary trees each with different characteristics. To classify a test image it is passed down each binary tree until it reaches a leaf node. At each leaf node there will be a probability distribution over classes which is determined by which images from the training set reached that node. The probability distributions from the leaf nodes reached is formed and the class with the highest probability is returned as the predicted class.

Nodes. All nodes other than leaf nodes contain a split function which determines whether an image passes left or right at that node. To choose the split function a large number of candidates are generated (currently 1000) and the entropy of the probability distribution at each child node is calculated for each candidate. The selected split function is then the candidate that gave child nodes with the lowest entropy (the greatest information gain).

Split Functions. There are many types of split function which can be used and new types can be added and removed very easily. These split functions can be based on any aspect of the image such as colour, texture or shape. The tests can also be run on the whole image, a certain area of the image or a single component of the image (such as just the left forewing wing on a butterfly).

Testing. Early tests less than two weeks into the project gave an accuracy of 78.26%. At this stage only very simple split functions were being used and we are confident that we will be able to significantly improve upon this result.

Crucible Theme: Machine learning

Teaching rhetoric with tangible interfaces

This project funded by the European commission under the title "WEBKIT" explored the use of tangible user interfaces to help schoolchildren understand the structure of argument when researching and presenting controversial topics debated on the Web. A series of tangible prototypes were created and evaluated in classrooms, with the final operating version using RFID technology to relate argument structures to presentation content, facilitate collaborative discussion among children, and optimise search engine results that are relevant to the topics under discussion.

Crucible team:

- Alan Blackwell
- David Pratt
- Mandy Carmichael
- Eleanor Toye
- Jennifer Rode
- Mark Stringer

Team coordination with tangible interfaces

Project funded by Boeing Corporation, with collaborators from the Engineering Department and Computer Laboratory.

Two application scenarios were investigated with working prototypes. The first, built by Gerhard Reitmayr, used a projection augmented physical map to interact with real-time information about flood management. The second, built by Darren Edge, used a bimanual peripheral display with tangible tokens for short-term coordination of an engineering team. This system was deployed at AlertMe, and evaluated by a team including Laura James and Amyas Phillips.

Crucible team:

- Alan Blackwell
- Tom Drummond
- Gerhard Reitmayr
- Darren Edge
- Lorisa Dubuc

Crucible Theme: Human-computer interaction

Technology for mental health

Continuing David Coyle's previous PhD research, this project is exploring how technology can reshape traditional mental health interventions, including deploying computer-game like interfaces in therapeutic situations as a basis for directed conversations and cognitive behavioural therapy

Project lead:

David Coyle

Collaborators:

- Paul Fletcher
- Alan Blackwell
- Cecily Morrison
- Gavin Doherty (Trinity College Dublin)
- Gary O'Reilly (University College Dublin)
- Tim Dalgliesh (Cognition and Brain Science Unit)
- Richard Myers-Steadman

Publications:

Crucible Theme: Motivation and behaviour change

The Divine Comedy as a faithful videogame

Dante's Divine Comedy has been the focus for a wealth of humanities scholarship over centuries. However the work itself can also be considered as a technological innovation, in which Dante constructed interactive experiences for his readers through new developments of literary form. This project is investigating the ways in which videogame theory can throw light on Dante's achievement, and extend the ever-fertile opportunity for new readings of the Commedia.

Crucible team:

- Kath Powlesland
- Heather Webb
- Alan Blackwell

The IQ of crowds

Building on "The Wisdom of Crowds", this project by Michal Kosinski and collaborators from Microsoft Research Cambridge used the Amazon Mechanical Turk together with some smart machine learning algorithms to optimise the collective intelligence of a group of randomly selected volunteers.

Collaborators:

- Michal Kosinski
- Thore Graepel
- Jurgen Van Gael
- Yoram Bachrach

The Mephistophone

The Mephistophone is an artificially-intelligent musical apparatus that listens to its acoustic environment, changing the shape of its latex surface in response to the features of the sounds that it hears. An early version appeared on-stage in a key scene of Matthew Herbert's chamber opera The Crackle, staged in the Royal Opera House Covent Garden in May 2014. In this first deployment, Matthew applied the device as a "Remembering Table" that reconstructed his interpretation of an abstract audio soundscape of water sounds. Within his interpretation of the Faust legend, the Remembering Table became one element of a Mephistophelean bargain struck by a school music teacher who accepted the promise of technology to fund and transform his classroom. As the members of the Covent Garden Youth Chorus sing of their resulting anxiety, the Table appears as if possessed by an organic and animate entity that dramatically conveys the mystery of music-making machines.

- Patrick Wollner
- Isak Herman

- [Alan Blackwell](#)
- [Leo Impett](#)
- [Haikal Pribadi](#)

Theories of function in design

[Nathan Crilly](#) has been appointed to the Crausaz Wordsworth Interdisciplinary Fellowship in Philosophy at [CRASSH](#), where he will be exploring the topic "How System Attributes Influence System Function"

He will be conducting research into how a system's attributes influence its capacity to function under uncertain operating conditions. These systems can be of many different kinds, including technical systems (e.g. machines and software), biological systems (e.g. organisms and ecologies) and social systems (e.g. institutions and regulations). These system types can also be combined into hybrid systems, including socio-technical systems (e.g. airports, cities and power systems). All these system types operate under uncertain conditions, whether that uncertainty relates to the environment in which the system must function, the state of the system itself or the demands that are placed upon it. Across different types of system, there are recurring system attributes that can be observed to influence a system's capacity to function under uncertain operating conditions. These attributes are often described by terms such as 'modularity', 'redundancy', 'scalability', 'robustness', and so on. He will be working to identify, define and classify such system attributes, and explore how they apply to different system types and different kinds of uncertainty.

Tone row explorer

Project carried out by [Martin Dixon](#), supervised by [Alan Blackwell](#) to interactively explore tone row composition following the rules defined by Schoenberg for his 12-tone serial system.

[Music technology \(Crucible theme\)](#)

Transition to electronic patient records

What happens when paper charts disappear from a hospital ward? The intensive care unit at Papworth Hospital implemented a fully digital bedside record system, under the gaze of a variety of social scientists and information systems experts. The results led to publications in both clinical medicine and technology research, contributing to future best practice.

This project was funded by [Boeing Corporation](#) and [iMDsoft](#)

Crucible collaborators:

- [Cecily Morrison](#)
- [Alain Vuylsteke](#)
- [Alan Blackwell](#)
- [David Good](#)
- [Matthew Jones](#)

[Crucible Theme: Healthcare IT](#)

Trusting e-Medicine

People increasingly access healthcare services and medical advice via online portals. The focus of this project is studying the psychological dynamics by which people assess and place trust in information services provided in this way.

Crucible team:

- [Tanja Schomann](#)
- [David Good](#)
- [Alan Blackwell](#)

[Crucible Theme: Healthcare IT](#) [Crucible Theme: Trust](#)

Turning Worlds Dance: Quantum

Collaborative music/sculpture/dance art production including:

- [Jane Turner](#)
- [Richard Hoadley](#)
- [Melissa Pierce Murray](#)

And input from other Crucible members.

Understanding viral video

This research project by PhD student [Dominic Yeo](#) was supervised by [David Good](#) and examined by [Alan Blackwell](#).

It involved a detailed analysis of the audience for a specific YouTube video - the Hong Kong "Bus Uncle" - investigating its social context, and relation to other media forms.

Untraditional Folk

This project created an interactive model for analysing alternative-popular folk music with a research-based web community database.

As an MPhil student in Music, [Rachel Sweeney](#) explored use of the Web as site for conjunction of academic and popular fan discourse around new cultural/genre movements. Her action research case study focused on the genre then described as "nu-folk".

Products of the research included the Untraditional Folkmusics website (last access in July 2011), a prototype tangible authoring system for exploration and annotation of multimedia critical discourse, and a large-scale mixed media visualisation of perspectives in critical musicology.

<http://www.untraditionalfolkmusics.co.uk/>

Collaborators:

- [Nicholas Cook](#) (co-supervisor of dissertation)
- [Alan Blackwell](#) (co-supervisor of dissertation)
- [Tim Regan](#) (large scale visualisation)
- [Alex Kuschner](#) (tangible authoring system)

Usable security configuration

This consultancy project for Cambridge company [nCipher](#) (subsequently acquired by [Thales](#)), developed a user-centred redesign of the configuration processes for their computer security products.

Crucible team:

- [Alan Blackwell](#)
- [Luke Church](#)

User experience of device interoperability

Even in everyday work or home contexts, people increasingly struggle with the experience of making devices talk to each other. Once the professional preserve of professional specialists, the encounter between different corporate standards and industry bodies plays out in our personal life. This consultancy project for startup company [fonleap](#) is investigating the way people experience these challenges.

Collaborators:

- [Cecily Morrison](#)
- [Alan Blackwell](#)
- [John Norman](#)
- [Alban Rustemi](#) (fonleap)
- [Dan Greenfield](#) (fonleap)

User interface design for bioinformatics

This project for [LION Bioscience](#) explored the implications of user interfaces in which it is necessary to navigate ontology structures.

Crucible project team:

- [Alan Blackwell](#)
- [Lorisa Dubuc](#)
- [Eleanor Toye](#)

User-customisable systems to support disaster medicine in China

Most systems that support disaster management help coordination of the effort rather than the clinical work. This research project will consider how user-customisable systems can be used to support clinicians during a disaster while producing data to enable public health efforts.

Project leader: [Cecily Morrison](#)

Crucible collaborators:

- [Alan Blackwell](#)
- [Alain Vuylsteke](#)
- [Matthew Jones](#)
- [Luke Church](#)

[Crucible Theme: Healthcare IT](#)

Video analytics

Project funded by [Boeing Corporation](#), exploring ways in which recorded video data can be used with computer vision techniques to create interactive tools for forensic analysis. Experimental prototypes created using this approach have included DeepZoom, TimeTunnel and ForensicMesh.

Project lead:

- [Alan Blackwell](#)

Crucible staff:

- [Xiaomeng Wang](#)
- [Laurynas Karazija](#)
- [Matthew Mahmoudi](#)
- [Matt Cornford](#)
- [David Hui](#)
- [Alexander Simpson](#)
- [Ana Semrov](#)
- [Abhishek Chander](#)
- [Luke Baxter](#)

Collaborators:

- [Vaiva Kalnikaite](#)

Virtual theatre of the Early Modern period

This project co-ordinated by [Barbara Ravelhofer](#) with support from the University of Bologna set out to develop a multimedia online resource to study seventeenth-century English theatre, including 3-D digital models of early theatrical spaces, animated scenes and a collection of explanatory material. The project was hosted in Cambridge by [CRASSH](#), with research and technical support from [CUMIS](#).

Collaborators included:

- [François Penz](#)
- [Maureen Thomas](#)
- [Ludvig Lohse](#)
- [Adrian Poole](#)
- [Alan Blackwell](#)

[Crucible Theme: Digital Humanities](#)

Virtual Violins

In this project funded by the Leverhulme Trust, engineers, psychologists and musicologists are working to inform the art of violin-making, by constructing Virtual Violins to understand the relationship between the acoustic properties of the instrument and human perception of musical sound. The results inform not only research into music perception and performance, but understanding of the perception of vibration more generally. The significant design research question for Crucible is the complex interaction between ancient cultures of connoisseurship and virtuosity, intersecting in a technically sophisticated material culture practice.

Research Horizons feature article: <http://www.research-horizons.cam.ac.uk/features/virtual-violins.aspx>

Crucible collaborators:

- [Jim Woodhouse](#)
- [Claudia Fritz](#)
- [Ian Cross](#)
- [Brian Moore](#)
- [Alan Blackwell](#)

Crucible Theme: Music technology

Virtuosity in computer use

What does it mean to be a computer 'virtuoso'? By studying expert musicians who use computers, in collaboration with the Centre for Music and Science, we can develop new understanding of human experiences with technology. This PhD research project by Chris Nash has involved the development and deployment of a music synthesis tracker plugin, which has been instrumented to collect data on the experiences of the musicians and composers who used it over a period of 2 years.

Crucible team:

- [Chris Nash](#)
- [Alan Blackwell](#)
- [Ian Cross](#)

Visual design constraint overlays

Undergraduate research project by [Hanna Wallach](#), supervised by [Alan Blackwell](#) in collaboration with [Robert Aish](#) and staff of architectural practice Foster and partners.

This project explored computer tools for constraint-based design, and created a novel graphical overlay of design constraints. On the basis of this project, Hanna was nominated for, and won, the UK national prize for Computer Science student of the year.

Blackwell, A.F. and Wallach, H. (2002). Diagrammatic integration of abstract operations into software work contexts. In M. Hegarty, B. Meyer and N.H.Narayanan (Eds.), *Diagrammatic Representation and Inference*, Springer-Verlag, pp. 191-205.

Visualisations for collaborative work

This project investigated the ways in which different kinds of visual representation are used in professional collaborative situations, drawing on previous work formalising the Cognitive Dimensions of Notations. The project built on Martin Eppler's development of collaborative visualisation tools, and included interviews with a range of specialist consultants to understand collaboration work practices.

The final output was a design guide for practitioners who need to select or develop visual representations for use in collaborative contexts:

Bresciani, S., Blackwell, A.F. and Eppler, M. (2008). Choosing visualisations for collaborative work and meetings: A guide to usability dimensions. Darwin College Research Reports DCRR-007. <http://www.dar.cam.ac.uk/dcrr/dcrr007.pdf>

Core team:

- [Sabrina Bresciani](#)
- [Martin Eppler](#)
- [Alan Blackwell](#)

Crucible contributors:

- [Charles Boulton](#)
- [Barry Hedley](#)

Visualise - Arts and Technology

Led by [Dipak Mistry](#) of [Arts and Business](#) in association with [Anglia Ruskin University](#), this project is building on previous Crucible experiments in artistic residencies, through a scheme to commission artist contributions to technology business applications.

Crucible contacts with the project include:

- [Caroline Hyde](#)
- [Alan Blackwell](#)
- [Charles Boulton](#)
- [Bronac Ferran](#)
- [Giles Lane](#)
- [Alan Payne](#)

VNC video wall

This student design project was carried out for clients [Quentin Stafford-Fraser](#) at [Newnham Research](#).

The original design brief was:

The public display screens in the Gates Building “Street” are informative, but don’t showcase the abilities of our students. Using the DE2 teaching boards, it should be possible to create a “video wall” that accepts VNC display commands and outputs a large display across multiple screens. Start with four screens, driven from four DE2 boards. Provide a software application interface suitable for use in a student design competition to create an interactive display that will impress visitors. The application interface might also provide audio, motion, SMS, web or environment sensing via the DE2 for multimodal interaction.

Ways of Machine Seeing

A series of events exploring ways in which John Berger's classic Way of Seeing carries new implications in the age of computer vision algorithms and robotic cameras. In association with [CRASSH](#), the [Digital Humanities Network](#) and [Anglia Ruskin University](#).

Crucible team:

- [Anne Alexander](#)
- [Alan Blackwell](#)
- [Leo Impett](#)
- [Geoff Cox](#)
- [Shreepali Patel](#)
- [Luke Church](#)

Web content on small screens

This design project led by [Natasa Milic-Frayling](#) at Microsoft Research Cambridge extended the first generation of web browsers on pocket-sized devices (the Compaq iPAQ), exploring different models for dealing with the tradeoff between detail and context.

Publications:

Milic-Frayling, N., Sommerer, R., Rodden, K. and Blackwell, A.F. (2004). SmartView and SearchMobil: Providing overview and detail in handheld browsing. In Mobile and Ubiquitous Information Access (Lecture Notes in Computer Science), Springer, pp 158-171.

Rodden, K., Milic-Frayling, N., Sommerer, R. and Blackwell, A. (2003). Effective Web Searching on Mobile

Devices. In Proceedings HCI 2003, pp. 281-296.

N. Milic-Frayling, R. Sommerer, K. Rodden and A. Blackwell (2003). SearchMobil: Web Viewing and Search for Mobile Devices. In Proceedings of the Twelfth International World Wide Web Conference.

Project team:

- [Natasa Milic-Frayling](#)
- [Kerry Rodden](#)
- [Ralph Sommerer](#)
- [Alan Blackwell](#)

Web usage in local government

This interdisciplinary design collaboration with Microsoft Research investigated patterns and contexts of web usage, working in partnership with a digital strategy team at Cambridgeshire County Council. An innovative mixed methods approach logged individual keystrokes from instrumented web browsers, capturing screen shots of all navigation. Data mining analysis was repeated on a daily basis, with distinctive episodes extracted and used for contextual interviews with individuals the following day, showing screen capture images to prompt them for reports of their experiences.

Publications:

Jones, R., Milic-Frayling, N., Rodden, K. and Blackwell, A. (2007). Contextual method for the re-design of existing software products. International Journal of Human-Computer Interaction, 22(1-2), 81-101.

Blackwell, A., Jones, R., Milic-Frayling, N. and Rodden, K. (2005). Combining logging with interviews to investigate web browser usage in the workplace. Presented at workshop on Usage analysis, combining logging and qualitative methods. CHI 2005.

Crucible team:

- [Natasa Milic-Frayling](#)
- [Alan Blackwell](#)
- [Kerry Rodden](#)
- [Rachel Jones](#)

Work Meets Life

This project carried out an integrative study of work in living systems, including scientists in biology, zoology, physiology and medicine together with perspectives from aerospace, business and engineering.

The result of the collaboration has been this guidebook, published by MIT Press:

<http://mitpress.mit.edu/catalog/item/default.asp?ttype=2&tid=12096>

Project leader:

[Bob Levin](#)

Crucible collaborators:

- [Alan Blackwell](#)
- [Simon Laughlin](#)

Archive of Crucible Network Members

A long-term goal of Crucible was to support the creation of a national network of researchers and educators having shared interests. The focus of this network was on collaboration between technologists and arts, humanities and social science researchers, leading to reflective research in interdisciplinary design.

Crucible also established collaborative relationships with Affiliated Researchers at other Universities and research organisations. These include graduates and previous members of the Network in Cambridge, as well as senior researchers with multidisciplinary backgrounds in design who have advised and collaborated with Crucible in the past.

The following list of 282 network members was last updated around 2014, meaning that many of these people have subsequently changed their affiliations or research interests. Sadly, some these colleagues have passed away since then, and this will not have been recorded in this historically captured version of the archive.

Abigail Sellen

Abi has been a member of research staff at Xerox EuroPARC, Hewlett Packard and Microsoft Research Cambridge.

Adrian Poole

Adrian is Professor of English, and contributed to the development of Digital humanities projects within CRASSH and the Cambridge-MIT Institute, including:

- Hamlet on the Ramparts
- Virtual theatre of the Early Modern period

Advait Sarkar

PhD student in the Rainbow Group, with an interest in big data analysis and visualisation.

Project: Seeing big data

Alain Vuylsteke

Alain is director of the Intensive Care Unit at Papworth Hospital. He collaborates regularly with Cecily Morrison on projects related to healthcare IT.

Crucible projects:

- Information systems in critical care
- Customisation of electronic patient records
- Transition to electronic patient records
- MetaVision user group
- Mobile Healthcare
- Bodies in Space
- User-customisable systems to support disaster medicine in China

Crucible Theme: Healthcare IT

Alan Blackwell

Alan Blackwell is Professor of Interdisciplinary Design at the University of Cambridge Department of Computer Science and Technology, having prior qualifications in professional engineering, computing and experimental psychology. He has 12 years experience of designing industrial systems, electronic and software products. He has taught design courses and supervised postgraduate design research students in Computing, Architecture, Psychology, Languages, Music and Engineering. His recent research activity has developed critical technical practice in relation to live coded performance, and the development of intelligent interactive systems. As director of Cambridge Global Challenges, he has a particular interest in

equitable knowledge infrastructure - the development of technologies compatible with indigenous knowledge and for use by low-income communities of the Global South. He is a fellow of Darwin College Cambridge and of the Royal Society of Arts, and has served as a Council member of the Cambridge Philosophical Society, and as a Director of Cambridge Enterprise.

Related appointments:

- Director of [Living East](#)
- Editorial board member of [Interdisciplinary Science Reviews](#)

His personal research interests, including activities beyond Crucible, extend to:

- [Visual Representation](#)
- [End-User Development](#)
- [Interdisciplinary Design](#)
- [Tangible, Augmented and Embodied Interaction](#)
- [Psychology of Programming](#)
- [Computer Music](#)
- [Critical Theory](#)

Alan Jackson

Alan is a member of staff at [Aptivate](#), and initiator of the [Bridging the Global Digital Divides](#) programme.

Alan Payne

Alan Payne is founder and CEO of Deep Visuals, a new media SME on the Cambridge Science Park specialising in interactive methods for engaging with digital collections. Prior to this Alan was Research Director of [Kodak European Research](#). Trained originally as an analytical chemist, he has had a number of management roles in diverse technology areas, most recently building research strategies for digital media. He is an advocate of user-led research and open innovation and is always keen to discuss collaboration opportunities with interesting people.

Alejandro Viñao

Alejandro is a composer who has written music for a wide range of musical genres including opera, music-theatre, choral, instrumental and electro-acoustic compositions. He has also created multimedia works, written film music and produced several radio programmes for the BBC. Viñao has worked in various research centres such as at IRCAM in Paris, M.I.T. in the USA and more recently at the [Computer Laboratory](#) and the [Centre for Music and Science](#) at Cambridge University. He is particularly interested in sound interpolation and in musical processes with more than one tempo.

Crucible projects:

- [Composer in residence - Alejandro Viñao](#)
- [Abraham on Trial/Baghdad Monologue](#)

Alex Driver

Alex is a PhD student in the [Institute for Manufacturing](#), supervised by [James Moultrie](#), and working on the [Design in Science](#) project.

Alex Oliver

Alex is a Reader in the Faculty of [Philosophy](#).

Crucible-related activities:

- [Philosophy of trust and cloud computing](#)
- [Humanities in the European Research Area](#)
- [Forum for Philosophy in Business](#)

Alex Taylor

Alex is a sociologist at [Microsoft Research Cambridge](#)

Crucible projects include:

- [Interact Artists in Industry](#)
- [Design, Theory and Society](#)

Alexa Wright

Alexa is a digital media artist, whose work [Face Value](#) was developed with Crucible support and collaboration under the [New Technology Arts Fellowships](#) programme.

Alexander Simpson

Alexander is a research programmer, who has been a core contributor to a series of Crucible projects:

- [Video analytics](#)
- [Re-use of clinical data](#)
- [Data analysis in Somali](#)

Alf Linney

Alf Linney is Emeritus Professor of Medical Physics at [University College London](#), where he collaborated with [Alexa Wright](#) and [Rana El Kaliouby](#) on the [Face Value](#) project within the [New Technology Arts Fellowships](#) programme.

Alice Street

Contributed to Crucible Projects:

- [Interdisciplinarity and Innovation](#)
- [Across Design](#)

Alison McDougall-Weil

Alison is a PhD student in the Engineering Design Centre, supervised by [Nathan Crilly](#)
<http://www-edc.eng.cam.ac.uk/people/afm35.html>

Alistair Haines

Alistair was associated with Crucible projects for the [Arts Council of England](#) (at East England Arts), and at [Living East](#).

Alistair Stead

Alistair is a PhD student in the Computer Laboratory, supervised by [Alan Blackwell](#)

He is investigating [Acquiring notational expertise](#)

His MPhil project supervised by Alan created the [SoundCodr graphic score interpreter](#).

[Crucible Theme: Music technology](#)

Allegre Hadida

Allegre is a creative industries specialist at the [Judge Business School](#). She contributed to the [Digital culture in society](#) proposal, and has convened both courses and meetings relevant to Crucible themes in new media.

Amiria Salmond

Amiria is affiliated with the [Museum of Archaeology and Anthropology](#), where she leads the [Artefacts of Encounter](#) project.

Amrit Srinivasan

Amrit Srinivasan is a professor at IIT Delhi, with research interests in comparative sociology of

knowledge and culture applied to new technologies. She works on pedagogy of design through the Design for Emerging Contexts (DECOS) Network for sustainable, ICT-based student teaching in India, Brazil, Turkey and China, and through Lens - Learning for Sustainability, in which Thailand, Finland, the Netherlands and India are creating multipolar networks for curricula in Product Service Systems Design with Politecnico Milano, Italy. She recently initiated PAEDIA - Peoples Archive (Education Industry & the Arts) - a not-for-profit based in Delhi, to fulfill the growing demand in India, for curricula focusing on lay skills and innovation traditions within an STS framework.

Amyas Phillips

Amyas was a member of technical staff at [AlertMe](#) and at [CARET](#).

Andrew Barry

Andrew is Lecturer in Human Geography and Fellow of St Catherine's College, University of Oxford. His recent book "Political Machines: governing a technological society", breaks new ground in Science and Technology Studies. His insights into the social and political constructs surrounding and arising from technological concepts gives us a new way of understanding the future of design.

Crucible projects:

- [Social Property and New Social Forms](#)
- [Design approaches to drug discovery](#)
- [Interdisciplinarity and Innovation](#)

Andrew Lovett

Andrew is a digital multimedia composer, now based at Princeton.

Crucible projects:

- [Collaborative performance technology](#)

Other Crucible connections:

- Composer of digital opera [Abraham on Trial](#).
- Convenor of [Cambridge Digital Arts Festival](#)
- Music lecturer at [CUMIS](#)
- Affiliated lecturer in the Cambridge [Music Faculty](#)
- Taught music theory to [Nick Collins](#) (as a boy!)

Andrew Rice

Andy is leader of the Computing for the Future of the Planet project at the [Computer Laboratory](#). He teaches a masters level design-oriented course on software development for mobile platforms.

Crucible projects include:

- [ReadYourMeter.org](#)

[Crucible Theme:Sustainability](#)

Anil Madhavapeddy

Researcher in the Cambridge Computer Laboratory, previously at Intel Research.

Crucible projects:

- [Mobile cloud](#)
- [Interactive optical tags](#)

Anne Alexander

Coordinator of the [Cambridge Digital Humanities Initiative](#), based at [CRASSH](#)

Anne studies the role of social media in political movements as a research fellow at [CRASSH](#), and also manages the [Cambridge Digital Humanities Initiative](#)

Projects include:

- [Critical coding](#)
- [Culture quest](#)
- [Cambridge Digital Humanities Initiative](#)
- [ICT, civil society and bottom-up governance](#)

Thematic interests:

- [Digital humanities \(Crucible theme\)](#)

Anne Anderson

Anne studies the role of social media in political movements as a research fellow at [CRASSH](#), and also manages the [Cambridge Digital Humanities Initiative](#)

Crucible projects include:

- [Cambridge Digital Humanities Initiative](#)
- [ICT, civil society and bottom-up governance](#)

[Crucible Theme: Digital humanities](#)

Anne-Sophie Baets

Anne-Sophie is a member of staff at [CARET](#), where she is a member of the team on the [Groups in academia](#) project.

Annette Wolfsberger

Annette was commissioned by [Arts Council of England](#) to work with [Dawn Giles](#) on strategic development of new technology media around Cambridge. Her work included convening the [Enter festival](#).

Anthony Dunne

Tony is a professor at the [Royal College of Art](#), where he is head of the Design Interactions department.

Crucible projects include:

- [Flagship Retrofit](#)
- [Digital culture in society](#)

Arlene Oak

Arlene is an Assistant Professor in the department of Human Ecology at the University of Alberta, and an Adjunct Professor in the Department of Culture and Communication at the University of Calgary. She has taught the historical and social context of design to students in design practice programmes, and helped develop an MA in the History of Printed Graphics (now part of the Critical Studies component of the MA in Graphics Practice) at University College Northampton. Her PhD research analysed how language is used during design practice (in tertiary-level design education) to express, and help constitute, the personal identities, social relations, cultural values, and assumptions that inform the creation of objects of material culture.

She completed her PhD in Cambridge under the supervision of [David Good](#), investigating spoken discourse in design studio teaching.

Crucible projects:

- [Distributed design studio](#)

[Crucible Theme: Design education](#)

Barbara Ravelhofer

Barbara coordinated the early [CRASSH](#) Digital Humanities project [Virtual theatre of the Early Modern period](#).

Barry Phipps

Barry is an artist/curator who holds a joint appointment at Kettle's Yard gallery and in the Institute of Astronomy.

Barry Rogers

Barry Rogers is a neuro-social psychologist with an interest in the temporality, plasticity and learning. He teaches at the London School of Economics, and as an executive education specialist.

Project: Digital Rosary

"My approach might best be described as that of critical sense-making.

The core of my practice takes place in a non-traditional educational setting. I design and deliver customized learning interventions inside organizations. I work with small groups of experienced adult professionals typically transitioning from specialist to enterprise roles. This transition tends to challenge assumptions surrounding identity, highlights automaticity and requires active sense-making. I am interested in the application of formal classroom learning in the workplace (e.g. 'transfer'). This area is highly problematic from both a theoretical and practical perspective.

Specifically I focus on the role of temporality in the generalization and maintenance of formal learning over time and space. Through my EdD research at the Faculty of Education I seek to make temporality visible. With Crucible colleagues I am currently working on an interactive visual tool. This aims to facilitate meaningful conversation and reflection on the relationship between learning and time in post-classroom ('real-world') settings.

I am interdisciplinary by nature and welcome all conversations of potential interest. Please feel free to contact me on barry@liberare.com / BMR32@cam.ac.uk +(44) 7780 978979"

Ben Glocker

Ben is a researcher in machine learning at Microsoft Research Cambridge. He is technical leader of the Taxonomic inference project.

Bernhard Krieger

As a PhD student in Social Anthropology supervised by James Leach, Bernhard carried out the [{Gender in open source}] project.

Bert Bongers

Bert was a PhD student registered in both the Engineering Design Centre and the Rainbow Group. His main interest was in the development of new computer music interfaces.

Crucible Theme: Music technology

Bill Cornish

Bill was founder of the Centre for Intellectual Property and Information Law in the Law faculty, and one of the team that convened the Collaboration and Ownership in the Digital Economy conference.

Bill Gaver

Bill was a postdoctoral researcher at Xerox EuroPARC, before moving to a post in the Computer-Related Design department at the Royal College of Art. He is now Professor of Design, and leads the Interaction Research Studio, at Goldsmiths, University of London. He contributed to one of the Age and Meaning projects within the New Dynamics of Ageing programme.

Bill Nicholl

Bill is a specialist in design education at school, and leads the Design and Technology programme within the Cambridge Postgraduate Certificate in Education.

- Cambridge Design Education Forum

Bill Thompson

Bill Thompson is a technology critic and essayist. He writes a weekly column on technology issues for BBC News Online, and is co-presenter of the BBC World Service programme Go Digital. He is an external lecturer at London's City University, and appears regularly as a speaker at events relating to digital media and policy.

<http://www.andfinally.com/>

Bob Bloomfield

Bob is Head of Innovation and special projects at the [Natural History Museum](#), London and a Fellow of NESTA (National Endowment for Science Technology and the Arts). As a senior policy developer at the Museum he focuses on innovations and initiatives that broadly contribute to Science and Society, including leadership of major redevelopment projects such as the Museum's Earth Galleries and the Darwin Centre.

Bob Levin

Bob initiated and coordinated the [Work Meets Life](#) project. He is director of the [Center for the Integrative Study of Work](#) at the University of Colorado, Boulder.

Brendan Burchell

Brendan is a sociologist who carries out interdisciplinary studies of labour markets and the well-being of employees

He was a member of the team for the [Distributed working](#) project funded by the [Cambridge-MIT Institute](#).

Crucible projects include

Brett Saunders

Brett was a PhD student in the [Rainbow Group](#), contributing as a technical consultant to several Crucible projects.

Crucible projects include:

- [Software design for videogames](#)
- [Design approaches to drug discovery](#)

Brian Ashbee

Brian is a video artist, animator and film-maker who was technical tutor at [CUMIS](#). He designed visuals for the stage production of [Andrew Lovett's](#) digital opera [Abraham on Trial](#).

Brian Moore

Brian is Professor of Auditory Perception in the Department of [Experimental Psychology](#).

Crucible projects include:

- [Virtual Violins](#)
- [Digital culture in society](#)

Brock Craft

Brock's research at the London Knowledge Lab focuses on development of design techniques for Information Visualisation, using qualitative research methods. Additional areas of interest are technology-enhanced education, participatory design, and sketching. He has lectured on Human-Computer Interaction, Design Prototyping, and e-Commerce, and regularly chairs the International Symposium for Design and Aesthetics in Visualisation. Brock has academic training in digital imaging and photography, human-computer interaction and computer science, together with commercial experience in information graphics and in computer network management. He also creates electronic interactive art, and collaborates with contemporary artists on interactive installations.

Crucible projects:

- Strategy roadmaps

Bronac Ferran

Bronac is a freelance writer, researcher and producer working nationally and internationally in the field of media art, art law and interdisciplinary practice. She is also a part-time academic at the Royal College of Art Industrial Design Engineering Department. She was formerly Director of Interdisciplinary Arts at Arts Council England, and served on the Adelphi Commission for Intellectual Property, the DCMS/AHRC Research and Knowledge Transfer taskgroup as well as the Creative Economy taskgroup on Intellectual Property and Competitiveness.

Crucible projects:

- Collaboration and Ownership in the Digital Economy
- New Technology Arts Fellowships
- Art and science research fellowships
- Interact Artists in Industry
- Drawing at a distance

Crucible collaborators include:

- Alan Blackwell
- Giles Lane
- James Leach
- Richard Harper
- Quentin Stafford-Fraser

Bruce Gernand

Bruce Gernand is a Research Fellow of Central Saint Martins College of Art and Design, having been Head of Sculpture at the College from 1997-2007. His research concerns are with grounding digital work in the material, and with craft-based techniques for digital form, using a range of CAD, rapid prototyping and sculptural techniques. He has held many teaching and visiting posts, including a Henry Moore Foundation Fellowship. He exhibits regularly in Amsterdam, Britain and elsewhere, and his sculpture was included in the Osaka Sculpture Triennale of 1995.

Crucible projects:

- Coded Chimera

Bruno Monteferri

Bruno is a graduate of the conservation leadership programme in Cambridge. He has carried out a range of interdisciplinary arts conservation projects in Peru.

Cambridge project:

- Gaming and conservation

Other projects include:

Exhibition associated with the Rimac Project. Three artists walked along the highly polluted Rimac river (145km in 21 days) from the high andes until it reaches the sea. Project blog and exhibition link: <http://rimac.wordpress.com/exposicion/>

Exhibition video and street art for poet Jose Villaran's AMLT Project. Phrases of a became stickers, distributed around the world, with photos of the stickers emailed back to the poet for reassembly as a collaborative book. Video link: <http://www.youtube.com/user/AMLT2010#p/a/f/0/WTQ1ZqfhQUw>

The Garden Project in collaboration with Slow Food Peru.

Nina Rumi 7x7 - 7 people from different disciplines invited to work with local communities for a week based from Bruno's house in Nina Rumi, a rural town one hour away of Iquitos, a city in the Peruvian Amazon.

Reverse Graffiti in Lima, with street artists drawing images on dirty walls, by cleaning them.

Carey Young

Carey was appointed as an artist in residence at Xerox EuroPARC under the Arts Council of England "Year of the Artist" initiative.

Carl Gombrich

Carl is Programme Director of the UCL Arts and Sciences programmes. In this role he has developed the interdisciplinary curriculum for an interdisciplinary BAsC introduced at UCL in 2012. He previously taught maths, physics, music and philosophy, and has also worked professionally as an opera singer. Before assuming responsibility for the programme, he was Principal of UCL's international preparatory certificates.

Design education (Crucible theme)

Carl Hogsden

Carl is a Computer Officer in the Museum of Archaeology and Anthropology, and a researcher on the Artefacts of Encounter project.

Catherine Hurley

Catherine manages the administration of CRASSH, where she has contributed to Crucible projects including Public value from technology in the arts, Collaborative performance technology and Interdisciplinarity and Innovation.

Cecilia Mascolo

Cecilia is a lecturer in the Computer Laboratory, specialising in social network analysis and mobile technology.

Crucible projects include:

- Social Sensing
- Super-influencers on social networks

Cecily Morrison

Cecily is currently a post-doctoral researcher in the Engineering Design Centre. Her work considers how technology can support clinicians in their care practices.

Crucible projects include:

- Information systems in critical care (ISCC)
- Emotion regulation therapies for people with cognitive impairment
- User-customisable systems to support disaster medicine in China
- Bodies in Space: Investigating technology as co-present group interaction
- Customisation of electronic patient records
- User experience of device interoperability
- Critical Care for the World

Charith Perera

Visiting post-doc from Australian National University in 2014.

Contributed to:

- Location-based IoT discourse
- Seamful museum experience

Charles Boulton

Charles is a Cambridge-based technology strategy consultant, whose company specialises in Innovation Coaching. After a PhD in Engineering from the University of Cambridge, he was a principal consultant for A D Little, before establishing his own company.

<http://www.cbboulton.co.uk/>

Crucible projects include:

- [Visualisations for collaborative work](#)
- [Interdisciplinarity and Innovation](#)
- [Mobile cloud](#)
- [Digital culture in society](#)

Charles Martinez

Charles is a tutor in photography at [Anglia Ruskin University](#). He was responsible for video documentation of initial studio work for the [Choreography and Cognition](#) project.

Cheryl Frances-Hoad

Cheryl is a Cambridge-based composer, who has been one of the [Artists in residence](#) hosted by members of the Crucible network, and continues to collaborate with Crucible members, for example in the performance of [Diptych](#) with a group of collaborators at [Anglia Ruskin University](#).

Crucible links:

- [Jane Turner](#)
- [Paul Fletcher](#)
- [Triggered](#)
- [Richard Hoadley](#)
- [Tom Hall](#)

Chris Earl

Chris is professor of design at the [Open University](#), and was a member of the team for the Crucible project [Across Design](#), funded by the [Cambridge-MIT Institute](#).

Chris Nash

Chris is lecturer at the University of the West of England. His Cambridge PhD in the [Computer Laboratory](#), was supervised by [Alan Blackwell](#) and [Ian Cross](#). That research explored [Virtuosity in computer use](#) through the remote observation of digital composers using a music package developed by Chris.

In the course of his PhD, he spent 6 months working as the first user interface specialist at music software company Steinberg.

Crucible projects include:

- [Composer in residence - Alejandro Viñao](#)
- [Performance capture](#)
- [Collaborative performance technology](#)

[Crucible Theme: Music technology](#)

Chris Roast

Chris is a Reader in the School of Computing and Management Sciences at Sheffield Hallam University. He has degrees in Human Computer Interaction from the University of York and in Design Research from the Royal College of Art. His work is fundamentally multi-disciplinary, aimed at creating formal models of user requirements and usability of information artefacts. He was the primary technical chair of HCI98, and remains an active committee member of conferences in the field.

Chris Sandbrook

Director of the Cambridge programme in Conservation Leadership.

Crucible projects:

- [Acoustic Bio-diversity Monitoring](#)
- [Race the Wild](#)

- Science Non-fiction and the Bottom Billion

Christopher Newfield

Christopher Newfield is Professor of Literature and American Studies in the English Department, University of California at Santa Barbara

Projects associated with Crucible include Global Critical University Studies and Limits of the Numerical

His research interests include:

I: Universities: funding and public policy; technology transfer as a public good; relations among teaching, research, and learning; teaching/learning intellectuality and conceptual integration; MOOCs and online technology; social life of universities.

II. Innovation Theory: collaborative networks; group psychology of innovation; cultural factors in innovation; practices of originality; mass creativity, intellectual property and open source; DIY knowledge processes (academic and non-academic), innovation in novel renewable energy technologies

III. Literature and humanities: liberal arts as practical arts; crime fiction; science fiction; textual interpretation; interpretation as social practice; humanities as mode of investigation

Crucible Theme: Policy research

Claudia Eckert

Claudia was Assistant Director of the Engineering Design Centre, prior to her current appointment as Senior Lecturer in Design at the Open University.

Crucible projects include:

- Across Design
- Design, Theory and Society

Crucible Theme: Sketching as a design practice

Claudia Fritz

Claudia managed the Virtual Violins project in a post funded by the Leverhulme Trust, and was based at the Centre for Music and Science.

She is now based at the Institut Jean le Rond d'Alembert in Paris.

Clifford Dive

While at Qualcomm, Cliff was client for several student design projects including the Mobile mirror shopping assistant

Dan Ryder-Cook

Dan was a member of the development team on the project ReadYourMeter.org.

Darren Edge

Darren completed a PhD in the Rainbow Group, supervised by Alan Blackwell and with funding from Boeing Corporation. He is now based at Microsoft Research Asia, in Beijing.

Crucible projects include:

- Team coordination with tangible interfaces
- Making mobiles tangible

Crucible Theme: Human-computer interaction

Dave Gray

Dave Gray is an information designer, educator and management consultant focused on visual thinking and cross-disciplinary group creativity. He is the founder of XPLANE, a global consultancy serving the

Fortune 500, which is now part of the Dachis Group, a social business consultancy started by Razorfish co-founder Jeff Dachis. Dave is also a partner at the Dachis Group as well as the co-founder of Vizthink, an international community of visual thinkers. His most recent book, *Gamestorming: A Playbook for Innovators, Rulebreakers and Changemakers* was published by O'Reilly Media in 2010.

Crucible Theme: Sketching as a design practice

David Coyle

David was a Marie Curie (IRCSET) research fellow in the Rainbow Group, and is now a lecturer at the University of Bristol.

Projects:

- Technology for mental health
- Shared agency in computer use
- Pension understanding
- Mobile Healthcare
- Social Sensing

David Frohlich

David was a member of research staff at Hewlett Packard, and is now director of the Digital World Research Centre at the University of Surrey.

He principal investigator of one of the projects within the Bridging the Global Digital Divides programme.

David Good

- Education Director of the Cambridge-MIT Institute 2000-08
- Director of Education School of Biological Sciences
- Developed the initial remit for CARET
- Member of Council for the Royal College of Art
- Syndic of Cambridge Assessment

Projects:

- New Century Cities
- MediaCityUK
- Architectural ethnography
- Situational judgement test
- Understanding viral video
- British library in the digital age

David Leitner

David is a consultant ethnographer and PhD student in the department of Social Anthropology investigating social networking in the Cambridge innovation cluster.

Crucible projects include:

- Interdisciplinarity and Innovation
- AmbITion
- Digital culture in society

David MacKay

David is Professor of Natural Philosophy in the Cavendish Laboratory, where he is leader of the Inference Group. He was seconded in 2010 to the UK Department of Energy and Climate Change, where he is Chief Scientific Advisor. He has been a collaborator on many Crucible projects, and initiated some of the most successful.

Projects initiated by David include:

- Talks.cam

- ReadYourMeter.org
- [Dasher](#)

David's students and post-docs have also been regular contributors to Crucible projects:

- [Phil Cowans](#)
- [Per Ola Kristensson](#)
- [John Winn](#)
- [Seb Wills](#)
- [Hanna Wallach](#)

David Robey

David directed the [ICT Methods Network](#) for the [Arts and Humanities Research Council](#)

[Crucible Theme: Digital Humanities](#)

David Scruton

David is Documentation and Access Manager at the [Fitzwilliam Museum](#), where he managed the [eGuide](#) project, and acted as client for the student design project creating a prototype of a [next-generation museum guide](#).

[Crucible Theme: Digital humanities](#)

David Stillwell

David is ...

[Crucible Theme: Motivation and behaviour change](#)

Dawn Giles

Dawn coordinated several Crucible collaborations funded via the Eastern region of the [Arts Council of England](#).

Crucible projects included:

- [AmbITion](#)
- [Public value from technology in the arts](#)
- [Interact Artists in Industry](#)
- [Design, Theory and Society](#)

Dawn Nafus

Dawn is an anthropologist at Intel in Portland, Oregon and was trained in the Department of Social Anthropology at Cambridge, where her PhD was funded by [BT](#). She has interests in discourses of 'the technological', cultural notions of time, migration, mobility and border spaces, and gender and technology. She has done research in Russia and the UK.

Crucible projects:

- [Subversion, Conversion and Development](#)
- [Gender in open source](#)

Deborah Radasch

Debbie is a Crucible collaborator at [Boeing Corporation](#), responsible for commercial contributions by [Michal Kosinski](#) to [business value of social networking](#), [online aerospace clubs](#) and [flexible collaboration for aerospace development](#).

Dipak Mistry

Dipak is responsible for new collaborative initiatives at [Arts and Business](#)

He is responsible for the [Visualise - Arts and Technology](#) initiative in association with [Anglia Ruskin](#)

University.

Dominic Vergine

Dominic was a member of staff at Aptivate before moving to ARM. He was one of the initiators of the Bridging the Global Digital Divides project.

Dominic Yeo

Dominic was a PhD student in Social Psychology supervised by David Good, where he carried out research into understanding viral video. He is now a lecturer in Information Management at the University of East Anglia.

Doug Crawford-Brown

Doug is Executive Director of the Cambridge Centre for Climate Change Mitigation Research (4CMR).

Crucible Theme: Sustainability

Ed Champness

Founder of Optibrium, previously at ArQule, Ed has a background in computational chemistry, but developed an interaction design specialisation through his work with Crucible - especially Rachel Hewson and Brett Saunders. He continues to work on design approaches to drug discovery.

Ed acted for Optibrium as client for a student design project investigating scanning and feedback from chemical structures.

Eleanor Toyé

Eleanor (now Eleanor Scott) was a postdoctoral researcher based in the Rainbow Group, at Intel Research in Cambridge, and Oyster labs.

Crucible projects include:

- Teaching rhetoric with tangible interfaces
- Interactive optical tags

Eugene Giddens

Eugene is Skinner-Young Professor in Shakespeare and Renaissance Literature at Anglia Ruskin University, and Director of Research in the Faculty of Arts, Law and Social Sciences. He was one of the first researchers affiliated with CRASSH, and a core member of the team for the Crucible Digital culture in society proposal.

Eugene Terentjev

Eugene participated in two collaborative projects with sculptor Simon Biggs

Eugene also supervised the PhD of Michelle Rigozzi

Crucible project:

- New Technology Arts Fellowships
- Reactive materials in public art

François Penz

François was founder and director of the Cambridge University Moving Image Studio (CUMIS), supervising a wide range of PhD students and research projects, and also running the MPhil in Architecture and the Moving Image. He now directs the Cambridge Digital Studio for Research in Design, Visualisation and Communication.

Crucible projects include:

- Museums of the future

- [Digital culture in society](#)
- [Virtual theatre of the Early Modern period](#)
- [Design, Theory and Society](#)
- [Parsing life drawings](#)

Interdisciplinary PhDs co-supervised with [Alan Blackwell](#):

- [Martyn Dade-Robertson](#)
- [Gavin Hogben](#)
- [Grant Mitchell](#)

Gary Marsden

Gary is an Associate Professor at the University of Cape Town, where he works on the design of technology for use in the developing world. He is co-author of Mobile Interaction Design, a popular textbook for those working on new forms and contexts of user interface technology.

Gavin Burnage

Gavin created the Certificate in [Humanities Computing for Languages \(CHUCOL\)](#) in the Cambridge department of [Modern and Medieval Languages](#).

[Crucible Theme: Digital humanities](#)

Gavin Hogben

Gavin was previously a lecturer on the Cambridge department of [Architecture](#) and at [CUMIS](#), and is now a practicing architect, pursuing a part-time PhD co-supervised by [François Penz](#) and [Alan Blackwell](#). He is exploring the use of digital media within architectural design contexts, especially as related to mixed physical/virtual exhibition design.

Geoffrey Kantaris

Geoffrey is in the department of [Modern and Medieval Languages](#). He took faculty responsibility for the Certificate in [Humanities Computing for Languages \(CHUCOL\)](#) after [Gavin Burnage](#).

Georgina Born

Georgie was Professor of Anthropology in the University of Cambridge faculty of Social and Political Sciences, before moving to the University of Oxford.

She was one of the originators of the [Social Property and New Social Forms](#) project, and has participated in others including:

- [Design approaches to drug discovery](#)
- [Digital culture in society](#)

Gerhard Fischer

Gerhard is a Professor of Computer Science, a Fellow of the Institute of Cognitive Science, and the Director of the Center for Lifelong Learning and Design (L3D) at the University of Colorado at Boulder. His research is focused on new conceptual frameworks and new media for learning, working, and collaboration; human-computer interaction; cognitive science; distributed intelligence; social creativity; design; meta-design; domain-oriented design environments; and universal design (assistive technologies).

Gerhard Reitmayr

Gerhard held a post-doctoral post in the Cambridge [Engineering Department](#), funded by [Boeing Corporation](#), where he worked on the Crucible project [Team coordination with tangible interfaces](#). He is now Professor of Augmented Reality at the Graz University of Technology

Giles Lane

Giles is founder and co-director of Proboscis, an artist-led studio with a focus on research, public engagement and participation. He is a Visiting Tutor on the MA Design Critical Practice at Goldsmiths College (University of London) and is a Research Associate of the Media and Communications Department at London School of Economics. Giles was elected a Fellow of the Royal Society of Arts in 2008 for his contribution to community development through creative practice.

He led the Proboscis contribution to the project Groups in academia.

Giles Oliver

Giles is a practicing architect, and one of the founders of the Masters programme in Interdisciplinary Design for the Built Environment. He was a contributor to the Across Design project.

Gillian Crampton-Smith

Gillian established the Computer-Related Design department at the Royal College of Art and the Ivrea Interaction Design Institute. She is a European policy adviser on design education and research, and has provided strategic advice to Crucible.

Hanna Wallach

Hanna was an undergraduate in the Computer Laboratory, and a PhD student in the Cavendish Laboratory supervised by David MacKay. Her undergraduate dissertation supervised by Alan Blackwell won a national prize for best computer science student of the year.

Crucible projects include:

- Visual design constraint overlays
- Gender in open source
- Inference and direct manipulation

Hetty Blades

Hetty has been carrying out work on the ontology of dance, especially as revealed when dance is recorded and re-performed via digital media.

PhD supervisor:

Willard McCarty

Crucible collaborators:

- Luke Church
- Alan Blackwell

Hugh Shercliff

Hugh is in the Materials, Mechanics and Design Division of the Engineering Department. He has been joint organiser of the Undergraduate Research Opportunities Programme (UROP) for several years.

Ian Cross

Ian is director of the Cambridge Centre for Music and Science

Graduate students of Ian's who have collaborated on Crucible projects include:

- Nick Collins
- Chris Nash
- Martin Rohrmeier
- Neta Spiro
- Jenny Judge
- Jonathan Impett

Ian's projects with Crucible include:

- [Virtual Violins](#)
- [Virtuosity and flow in computer music](#)
- [Collaborative performance technology](#)
- [Improcess](#)
- [Composer in residence - Alejandro Viñao](#)

Ian Davies

Ian is a PhD student in the [Rainbow Group](#) of the [Computer Laboratory](#).

Projects include:

- [ReadYourMeter.org](#)
- [Performance capture](#)
- [Automated performance accompaniment](#)

Ignas Budvytis

Ignas is a PhD student in the [Engineering Department](#).

He was a member of the team for the [Making mobiles tangible](#) project.

Isak Herman

PhD student in the [Rainbow Group](#) exploring [Acoustic Bio-diversity Monitoring](#) as a case study for [Citizen science in the field](#).

Other projects include:

- [The Mephistophone](#)

Crucible collaborators:

- [Alan Blackwell](#)
- [Chris Sandbrook](#)
- [Patrick Wollner](#)
- [Leo Impett](#)
- [Haikal Pribadi](#)

Issam Kourbaj

Cambridge sculptor, artist by-fellow at Christ's College, visual arts tutor at Cambridge School of Arts and Sciences.

James Leach

James is ARC Future Fellow in Anthropology and Sociology at the University of Western Australia, and Director of Research at the Centre de Recherche et de Documentation sur l'Océanie. While a Research Fellow at King's College Cambridge, he was a central figure in several Crucible projects, investigating the theory and practice of description, with an emphasis on how material and social forms emerge from the processes of interdisciplinary collaboration. James is a social anthropologist who has conducted fieldwork in Papua New Guinea on kinship, place, myth/ritual, material culture, ownership and intellectual property. His subsequent fieldwork at Aberdeen and then internationally has focused on issues of creativity, knowledge production, and ownership in arts/science collaborations.

Crucible projects:

- [New Technology Arts Fellowships](#)
- [Social Property and New Social Forms](#)
- [Art-Science Research Fellowships](#)
- [Gender in open source](#)
- [Subversion, Conversion and Development](#)

James Moore

James is a Research Associate in the Brain Mapping Unit of the Department of Psychiatry. He has a specific interest in the perception of causation and agency, that is being applied in a number of Crucible projects concerned with technical contexts, mostly in collaboration with David Coyle and Paul Fletcher.

Crucible projects include:

- Empirical product aesthetics
- Shared agency in computer use

Crucible Theme: Design agency and intent

James Moultrie

James teaches design courses and leads a design research group in the Cambridge Institute for Manufacturing.

James Scott

James was on the staff of Intel Research in Cambridge, and now at Microsoft Research Cambridge. His special interest is in the design of new interactive hardware devices, including the development infrastructure of the Gadgeteer system.

Jane Turner

Jane is a choreographer and arts researcher. Her dance company specialises in the use of rule systems for emergent composition.

Crucible collaborators:

- Cheryl Frances-Hoad
- Richard Hoadley
- Alan Blackwell
- Satinder Gill
- Nick Rothwell

Crucible projects:

- Performance Programming
- Festival of Interactive Technology
- Triggered
- Turning Worlds Dance: Quantum

Crucible Theme: Emergence

Jason Rentfrow

Jason is a lecturer in the Psychometrics Centre, in the department of Social and Developmental Psychology.

Crucible projects include:

- Social Sensing
- Super-influencers on social networks

Jeff Osborne

Jeff is a sometime chip and vehicle designer, specialist in battery-powered vehicles (buses, not RC toys) and industrial automation engineer with Quin Systems <http://www.quin.co.uk/>.

Projects:

- Button brain

Jeff Patmore

Jeff was previously head of BT's Strategic University Research & Collaboration programme, directing programmes of work with some of the world's top academic institutions and collaborating with some of the best technology and business minds in academia. He has over 30 years industrial experience in information and communication technologies and currently his principal fields of interest are the management of innovative multi-disciplinary teams, knowledge sharing and open innovation. He is a Fellow of the RSA, and has previously been a Director of Young Engineers for Britain and a contributor to the Cambridge-MIT Institute. Following his retirement from BT in 2011 he has maintained his links with the University through membership of Pembroke College and he works closely with the Engineering Design Centre in the Department of Engineering.

Jem Rashbass

Jem was founding director of the Cambridge Centre for Applied Research in Educational Technology (CARET), developed from his directorship of the Cambridge Clinical and Biomedical Computing Unit, which has now become an independent NHS centre.

Jennifer Rode

Jen was previously a researcher in the Rainbow Group, subsequently undertook a PhD at the University of California Irvine building on her Crucible research, held a fixed term lectureship in UCLIC at University College London, and is now an Assistant Professor at the Drexel iSchool.

Crucible projects included:

- Teaching rhetoric with tangible interfaces
- Low literacy interaction
- Inference and direct manipulation
- Gender and domestic programming

Crucible Theme: Gender and technology

Jeremy Baumberg

Jeremy is Professor of Nanophotonics, and Director of the interdisciplinary Cambridge Nanophotonics Centre. In collaboration with Natasa Milic-Frayling, he is exploring use of touch and tablet technologies to support interaction in the Centre. He was a contributor to the Interdisciplinarity and Innovation project.

Jim Woodhouse

Jim is Professor of Structural Dynamics in the Cambridge Engineering Department, and a specialist in the mechanical properties of musical instruments. He coordinates the Musical Acoustics Network.

Crucible projects include:

- Virtual Violins
- Digital culture in society

Crucible Theme: Music technology

Jochen Runde

Jochen is Reader in Economics at the Judge Business School. He was a member of the team for the Interdisciplinarity and Innovation project.

Jofish Kaye

Jofish is a research scientist and ethnographer at Yahoo, where he applies perspectives from science and technology studies to domestic life, holistic health, sex, religion and improv comedy/theatre. He believes that studying the borders can tell you more about what the mainstream will be than studying the mainstream.

Projects:

- [Ethnomethodology in HCI](#)

John Barker

John is Director of [Cambridge Governance Labs](#), Fellow of the Lauterpacht Centre for International Law and Law Fellow at Hughes Hall. He has worked for over 30 years on good governance and rule of law in Africa.

John Clarkson

John is Director of the [Engineering Design Centre](#), the largest department in Cambridge dedicated to a design topic.

Crucible projects include:

- [Across Design](#)
- [Culture, Communication and Change](#)
- [Technology: Interaction and Design](#)
- [Design, Theory and Society](#)

John Knell

John's Cambridge-based company Intelligence Agency specialises in public policy issues in the arts and innovation.

Crucible projects include:

- [Interdisciplinarity and Innovation](#)
- [Public value from technology in the arts](#)
- [Digital culture in society](#)
- [Design, Theory and Society](#)

[Crucible Theme: Policy research](#)

John Lawson

While an undergraduate in the Cambridge [Engineering Department](#), John worked in a post funded by the [Undergraduate Research Opportunities Programme \(UROP\)](#), creating and evaluating prototypes for [Energy use visualisation](#) with funding from the [Flagship Retrofit](#) project.

[Crucible Theme: Motivation and behaviour change](#)

John Naughton

John is Professor of the Public Understanding of Technology at the [Open University](#), and a technology columnist for the Observer.

He has contributed to a range of Crucible events and projects, including:

- [RIP: A Remix Manifesto](#)
- [Design, Theory and Society](#)
- [Digital culture in society](#)

John Norman

John is Director of the Cambridge Centre for Applied Research in Educational Technology [CARET](#).

Crucible projects include:

- [Talks.cam](#)
- [Groups in academia](#)
- [Digital culture in society](#)
- [User experience of device interoperability](#)
- [Cambridge Digital Humanities Initiative](#)

John Piper

John was a researcher and designer based in the Kodak European Laboratory in Cambridge.

Crucible projects included:

- [Image license retrieval](#)
- [Museums of the future](#)

John Rink

John is Professor of Musical Performance Studies in the Faculty of [Music](#). He is director of the [Cambridge Digital Humanities Initiative](#), with a special interest in digital music editions.

[Crucible Theme: Digital Humanities](#)

John Rust

John is director of the [Psychometrics Centre](#), in the department of [Social and Developmental Psychology](#).

John Winn

John was a PhD student supervised by [David MacKay](#) in the [Cavendish Laboratory](#), and was awarded the Microsoft post-doctoral research fellowship in Machine Learning at Darwin College. He is now based in the Machine Learning group at [Microsoft Research Cambridge](#).

He was founder and CTO of Hypertag, a company that participated in a number of Crucible design explorations.

Jonathan Hook

Jon is a PhD student at [Culture Lab Newcastle](#), supervised by [Patrick Olivier](#). He has spent several periods working at [Microsoft Research Cambridge](#) with [Stuart Taylor](#), working on a range of arts and music interfaces, as well as more conventional interaction design projects.

<http://homepages.cs.ncl.ac.uk/j.d.hook/>

Project contributions include:

- [Coded Chimera](#)
- [Performing with Gadgeteer](#)

Jonathan Mackenzie

Jonathan was a member of staff at [CARET](#), and contributed to one of the [New Technology Arts Fellowships](#). He was a member of the CARET team developing [Gaming technologies for anatomy education](#)

Julio d'Escriván

Julio is an electro-acoustic composer, and reader in Creative Music Technology at [Anglia Ruskin University](#).

He has contributed to Crucible projects including:

- [Collaborative performance technology](#)
- [Improcess](#)
- [Digital culture in society](#)
- [Design, Theory and Society](#)

[Crucible Theme: Music Technology](#)

Jussi Parikka

Jussi is Reader in Media and Design at the University of Southampton (Winchester School of Art). He was the founding director of the research centre CoDE - [Cultures of the Digital Economy](#) - at Anglia Ruskin University.

He is interested in the interactions of art, science, technology and philosophy, and also topics related to politics (of production) and aesthetics in digital network culture. His books include *Digital Contagions: A Media Archaeology of Computer Viruses* (2007), *Insect Media* (2010) and the forthcoming *Media Archaeology and Digital Culture* (2012). He has co-edited such books as *The Spam Book: On Porn, Viruses and Other Anomalous Objects from the Dark Side of Digital Culture* (2009) and *Media Archaeology* (2011). Homepage and blog: <http://jussiparikka.net>.

Crucible Theme: Critical theory

Karl Prince

Karl was a researcher on the ReCliC project for Re-use of clinical data

Karmen Guevara

HCI researcher and psychoanalyst.

Crucible Projects:

- Collaboration in Internet Science
- Trust, Security and Privacy

Kath Powlesland

PhD candidate in Medieval Italian, studying Dante as videogame.

Participant in Critical coding

Kathleen Richardson

Kathleen completed a PhD in Social Anthropology, carrying out her field research at the MIT AI Lab, with support from the Cambridge-MIT Institute. She subsequently worked for BT. She directed the Cambridge Robot Project, and contributed to Horizon event The Thinking Machine. She is currently a post-doctoral researcher in the department of Social Anthropology at University College London.

Ken Wood

Ken is Assistant Director at Microsoft's Cambridge Research Lab where he heads the Computer-Mediated Living Group. The group's remit is fundamentally interdisciplinary, bringing together psychology, sociology, hardware engineering and computer science to address the problem of designing technology to support everyday life. Ken's research interests include human-computer interaction, information retrieval, multimedia communications, and ubiquitous computing. Prior to joining Microsoft, he was with AT&T Labs Cambridge, and before that Oxford University. He holds a doctorate in Computation from Oxford University and an AB in Applied Mathematics and Economics from Harvard University.

Kenneth Ruthven

Ken is Professor of Education and Director of Research in the Education Faculty. He has specialist interests in mathematics education, and in the use of computers in education.

Kenton O'Hara

Kenton has held research appointments at Xerox EuroPARC, Hewlett Packard, and Microsoft Research Cambridge.

He was coordinator for the activities of the Interact Artists in Industry programme in the south-western region.

Kerry Rodden

Kerry is a Usability Analyst at Google, in Mountain View, California. Her general interests are information retrieval and human-computer interaction; her PhD research at the University of Cambridge Computer Laboratory included evaluating novel interfaces for browsing through images, and studying how people manage their personal collections of digital photographs.

Crucible projects:

- [Sketchpad electronic edition](#)
- [Web usage in local government](#)
- [Web content on small screens](#)
- [Returning to online locations](#)

Kirk Woolford

Kirk is a Lecturer at the Centre for Material Digital Culture, Media and Film at the [University of Sussex](#).

Crucible projects include:

- [Programming as craft](#)
- [Performance capture](#)
- [Digital culture in society](#)

Krystyna Wojcik

Krystyna is a director of Cambridge-based graphic design agency [Catalyst Design](#)

Crucible projects include:

- [Low literacy interaction](#)
- [Returning to online locations](#)

Kurt Fendt

Kurt is Director of HyperStudio, MIT's Center for Digital Humanities. He was engaged with a number of humanities initiatives with the [Cambridge-MIT Institute](#), and acted as external examiner for the Certificate in [Humanities Computing for Languages \(CHUCOL\)](#).

[Crucible Theme: Digital humanities](#)

Lara Allen

Lara is executive director of the Cambridge [Centre for Global Equality](#)

She is director of impact and implementation for the [Global Challenges Initiative](#).

She was co-convenor of [Science Non-fiction and the Bottom Billion](#)

Laura Beckwith

Laura is currently based in Copenhagen, after completing a PhD with [Margaret Burnett](#) at [Oregon State University](#) on [Gender HCI](#).

During a summer research project in Cambridge, she explored end-user programming research questions related to tinkering (with [Alan Blackwell](#)) and self-efficacy (with [David Good](#)).

She is advising a project exploring gender design perspectives in physical product design, and extending these to interactive products.

Themes:

- [Crucible Theme: Gender and technology](#)
- [End-user development \(Alan Blackwell's research theme\)](#)

Laura James

Laura worked closely with Crucible projects at [AlertMe](#) and at [CARET](#). She is now joint-CEO of the [Open Knowledge Foundation](#)

Crucible projects include:

- [Groups in academia](#)
- [Team coordination with tangible interfaces](#)

Lee Wilson

Lee is an anthropologist, who during his fellowship at [CRASSH](#) contributed to a large range of Crucible projects, including:

- [Interdisciplinarity and Innovation](#)
- [Subversion, Conversion and Development](#)
- [Public value from technology in the arts](#)
- [AmbITion](#)

Leo Impett

Engineering student, intern in the [Rainbow Group](#) Summer 2013

Crucible projects:

- [Computer listens to robot music](#)
- [The Mephistophone](#)
- [Deep Zoom](#)
- [Digital Rosary](#)

Lionel Bently

Lionel is Herchel Smith Professor of Intellectual Property Law, and Director of the Cambridge [Centre for Intellectual Property and Information Law](#).

Lizzie Muller

Lizzie is a curator, writer and researcher specialising in interaction, audience experience and interdisciplinary collaboration. She is Senior Lecturer in the School of Design at the University of Technology, Sydney. Her doctoral project investigated the audience experience of interactive art.

She was initiator of the Crucible series of [New Technology Arts Fellowships](#) in 2002 with the Junction and Kettles Yard.

Lorisa Dubuc

Lorisa carried out PhD research under the supervision of [Alan Blackwell](#) and [David Good](#), in which she explored design questions related to [Communication with dementia](#).

She was also a member of the project team on [user interface design for bioinformatics](#), a research intern at [Google](#), and a user interface researcher for [CARET](#).

Louis Bucciarelli

Larry is Professor of Engineering and Technology Studies at MIT. He was a member of the project team on [Across Design](#), funded by the [Cambridge-MIT Institute](#).

Ludvig Lohse

Ludvig was a researcher at [CUMIS](#), and now on the staff of the [Natural History Museum](#).

Luke Church

Luke is a PhD student in the Computer Laboratory, supervised by [Alan Blackwell](#), and with funding from [Kodak European Research](#). He is investigating aesthetic and ethical approaches to programming languages, and programming-like computational experiences. His overall concerns are with very large scale computation experiences, and with emergence as a property of computer systems.

Projects include:

- [DesignScript](#)
- [Choreographic Language Agent](#)
- [AffectVsketch](#)
- [Making mobiles tangible](#)

- [ReadYourMeter.org](#)
- [Customisation of electronic patient records](#)
- [Shared agency in computer use](#)
- [Museums of the future](#)
- [Usable security configuration](#)

Crucible Theme: Emergence

Marc Cardle

Marc was a PhD student in the [Rainbow Group](#), and created digital visualisations for the [Maschinist Hopkins](#) project.

Marc Downie

Marc was a student at the [Cavendish Laboratory](#) and at the [MIT Media Lab](#), before starting his interdisciplinary arts practice software company OpenEnded Group. Marc is a key collaborator in the [Choreographic Language Agent](#) project, and contributed to the [Programming as craft](#) project.

Margaret Greeves

Margaret was assistant director of the [Fitzwilliam Museum](#), where she initiated a number of Crucible projects related to technology use in museums, including the [Museums of the future](#) project.

Crucible Theme: Digital humanities

Marian Petre

Marian is a Professor and design researcher at the [Open University](#), who has been PhD supervisor of Crucible members including [Rachel Hewson](#) and [Claudia Eckert](#)

Crucible Theme: Sketching as a design practice

Marilyn Strathern

As Professor of [Social Anthropology](#), and member of the Advisory Board and Management Committee for [CRASSH](#), Marilyn has had a long-term interest in interdisciplinarity, and has been closely involved in a number of Crucible projects.

She directed the project [Social Property and New Social Forms](#), as a component of which she published reflections on the social enterprise of interdisciplinarity in the book [Commons and Borderlands](#).

Collaboration in other projects has included:

- [Interdisciplinarity and Innovation](#)
- [Gender in open source](#)
- [Collaboration and Ownership in the Digital Economy](#)

Mark Blythe

Mark is Professor of Interdisciplinary Design at the University of Northumbria.

Crucible projects:

- [Age and Meaning](#)
- [Ethnomethodology in HCI](#)
- [Critical design textbook](#)

Mark de Rond

Mark is Reader in Strategy and Organisation at the [Judge Business School](#).

Crucible projects include:

- [Interdisciplinarity and Innovation](#)
- [Mobile cloud](#)

- [Design, Theory and Society](#)

Mark Gross

Mark teaches computational design at Carnegie Mellon University's School of Architecture. He previously co-directed the Design Machine Group at the University of Washington, developed a design computing curriculum at the University of Colorado, and co-founded the Sundance Lab for Computing in Design and Planning. He worked at Negroponte's Architecture Machine Group, Papert's MIT Logo Lab, and Atari Cambridge Research before joining the faculty at Colorado. He is a member of the IEEE, ACM, AAAI, and the Association for Computer Aided Design in Architecture.

Mark Palmer

Mark is a sculptor and arts researcher appointed to one of the Crucible [New Technology Arts Fellowships](#). He was subsequently appointed to a joint research position between the [Watershed](#) arts centre and Bristol School of Art, Media and Design at the [University of the West of England](#).

Mark Stringer

Mark was a researcher in the [Rainbow Group](#), having previously been at [Xerox EuroPARC](#) and subsequently [University of Sussex](#). While in the [Computer Laboratory](#), he was a member of the project team for [Teaching rhetoric with tangible interfaces](#)

Mark Turin

Mark is a researcher based at [CRASSH](#), where he directs the [World Oral Literature Project](#) and the [Digital Himalaya Project](#).

Other Crucible collaborations include:

- [European Storytelling Archive](#)
- [Cultures of the Digital Economy](#)

[Crucible Theme: Digital Humanities](#)

Martin Dixon

Martin is a lecturer in Music at Glasgow University. After a PhD in the [Music](#) faculty supervised by [Ian Cross](#), Martin completed the postgraduate Diploma in Computer Science at the [Computer Laboratory](#). His Dipolma project was a [Tone row explorer](#)

Martin Eppler

Martin is a professor of information and communication management at the University of St. Gallen (HSG), faculty of management sciences. He teaches knowledge visualization at different universities in Switzerland, Austria, Finland and China and conducts research on the role of visualization for knowledge-intensive collaboration and communication, particularly between experts and decision makers.

<http://www.knowledge-communication.org>

Crucible projects:

- [Visualisations for collaborative work](#)
- [Strategy roadmaps](#)

[Crucible Theme: Sketching as a design practice](#)

Martin Kusch

Martin is Professor of philosophy at the University of Vienna, and was previously professor of Philosophy and Sociology in the Cambridge Department of [History and Philosophy of Science](#).

He contributed to Crucible projects on [Metaphors of interaction](#) and [Design, Theory and Society](#).

Martin Rohrmeier

Martin is a mathematician, musicologist and jazz pianist. He completed a PhD in music cognition at the [Centre for Music and Science](#), supervised by [Ian Cross](#), and funded by [Microsoft Research Cambridge](#). He subsequently worked in the machine learning group at Microsoft, exploring inference of musical structures.

Martin Stacey

Martin is a lecturer at De Montfort University

- [Across Design](#)

Martyn Dade-Robertson

After finishing his design research PhD at [CUMIS](#), Martyn became a research associate at [Culture Lab Newcastle](#), where he worked on cultural and cognitive aspects of physically-anchored systems of spatial organisation. He was then appointed to a lectureship in architecture, also in Newcastle. He originally trained as an architect, and has a particular interest in participatory design prototyping, and in the application of architectural methods to the design and analysis of spatial hypertexts.

Crucible projects:

- [Architectural views of information retrieval](#)

Crucible collaborators:

- [François Penz](#)
- [Maureen Thomas](#)
- [Alan Blackwell](#)
- [Ken Wood](#)
- [Ralph Sommerer](#)

Mary Jacobus

Mary was director of [CRASSH](#) from 2006-2011, and actively promotes interdisciplinarity in the humanities. She chaired the conference [Digital Resources in the Humanities and Arts](#), worked closely with [David Robey](#) in establishing Cambridge participation in the AHRC [ICT Methods Network](#), and has been a key champion for the establishment of the [Cambridge Digital Humanities Initiative](#).

[Crucible Theme: Digital Humanities](#)

Matt Ratto

Matt is an Assistant Professor and director of the Critical Making lab in the Faculty of Information at the University of Toronto.

Crucible projects include:

- [Gender in open source](#)
- [Subversion, Conversion and Development](#)

[Crucible Theme: Critical theory](#)

Matt Rogalsky

Matt is a composer and musicologist at Queen's University in Ontario. While completing an electronic music PhD in Cambridge, and working as a computer officer in the [Judge Business School](#), Matt contributed to the [Cambridge Digital Arts Festival](#), the [Live Experimental Arts Performing Society](#) and the [Digital music discussion group](#) that prepared ground for Crucible.

Matt Segall

Founder of Optibrium, previously at ArQule, Matt commissioned a Crucible team to develop new [design approaches to drug discovery](#) that exploited quantum mechanical modelling techniques to optimise drug discovery processes through in silico simulation of compounds before they were synthesised.

Matthew Jones

Matthew is a lecturer in Information Systems at the Judge Business School. He has a special interest in IT systems for use in healthcare.

Crucible projects include:

- MetaVision user group
- Transition to electronic patient records
- Human participants in technology research
- User-customisable systems to support disaster medicine in China

Crucible Theme: Healthcare IT

Matthew Postgate

Matthew is head of Research and Innovation at the BBC. He joined Crucible when he was Executive Producer in Mobile technologies, with a role including the distribution of content to mobile devices and creation of interactive mobile services. Principal interests include digital product design, the effect that new technologies have on society, and technology regulation.

Matthew Taylor

Matthew is the director of Escape Artists (<http://www.escapeartists.co.uk>), a socially inclusive arts charity, based in London and Cambridge, that is working on the development of a system for measuring the wellbeing, in a wide variety of different contexts, through any internet connected device.

Maureen Thomas

Maureen was creative director of the Cambridge University Moving Image Studio (CUMIS), and teaches on the Cambridge MPhil in Screen Media and Cultures.

Crucible projects include:

- Museums of the future
- Digital culture in society
- Virtual theatre of the Early Modern period
- Design, Theory and Society

Mel Leggatt

Mel established the computer systems for CRASSH as their inaugural computer officer, and also convened the first CRASSH meeting on Representing Knowledge: Exploring Computational Techniques. She directs the Certificate in Humanities Computing for Languages (CHUCOL).

Crucible Theme: Digital Humanities

Melissa Pierce Murray

Sculptor, advisory input on Palimpsest, collaborator in Turning Worlds Dance: Quantum

Mia Gray

Mia is based in the department of Geography.

Crucible projects include:

- Distributed working
- Mobile cloud
- Design, Theory and Society

Michael Harrison

Michael is Director of the Kettle's Yard Gallery, and was involved in the establishment and funding of the New Technology Arts Fellowships.

Michael Joroff

Michael is based in the MIT Department of Urban Studies and Planning, and was involved in several projects within the Cambridge-MIT Institute and subsequent research and consultancy arising from those.

Crucible projects include:

- Distributed working
- Architectural ethnography
- New Century Cities
- MediaCityUK
- Digital culture in society

Michael Nitsche

Michael Nitsche works as Associate Professor at the School of Literature, Communication & Culture (LCC) at the Georgia Institute of Technology, where he teaches courses for the Digital Media M.S. and Ph.D. program, as well as for the Computational Media undergraduate program. He founded the Digital World & Image Group (DWIG), which is the home for his ongoing practice-based research projects. He is member of the Graphics & Visualization Unit (GVU) and of the Georgia Tech Center for Music Technology (GTCMT), as well as other interdisciplinary centers.

How can digital media support the expressive interaction between people? Informed by his background in architecture and media/ drama studies, Michael's main research interest focuses on the interconnections between digital and physical spaces and how we use them to interact with others. Focusing on the expressive level of this interaction, he often applies drama and performance elements to HCI but the underlying methodology is interdisciplinary and builds on HCI, as well as architecture, film studies, and performance studies.

Nitsche published his first book Video Game Spaces: Image, Play, and Structure in 3D Worlds, published in spring 2009 with The MIT Press and co-edited The Machinima Reader (with Henry Lowood, TBP spring 2011, MIT Press). In addition to his book projects, Nitsche has published numerous peer-reviewed articles in his research fields and won best paper awards at the ACM Sandbox symposium (part of SIGGRAPH) 2008. He has also contributed a range of chapters for edited collections and published in preeminent journals, including IEEE Computer Society, Digital Creativity, and Leonardo. The Digital World & Image Group has received support from industry partners such as Turner Broadcasting, Google, and Alcatel-Lucent as well as substantial funding from the NSF.

Michael holds a Ph.D. in Architecture and an M.Phil. in Architecture and the Moving Image from CUMIS. He received his M.A. in Drama and German Language from the Freie Universität, Berlin and finished his undergraduate studies at the Ludwig Maximilians Universität, München.

Personal home page: <http://www.lcc.gatech.edu/~nitsche/>

Digital World & Image Group: <http://dwig.lcc.gatech.edu/>

Current projects in the group: <http://dwig.lcc.gatech.edu/projects.html>

General information about Georgia Tech graduate programmes in Literature, Communication and Culture: <http://lcc.gatech.edu/graduate/>

Michal Kosinski

Michal is now at Stanford University. His Phd research was funded by Boeing Corporation, co-supervised by David Good and Alan Blackwell, and contributed to a number of Crucible projects.

Michelle Rigozzi

Michelle completed her PhD under the supervision of Eugene Terentjev, based in the Physics of Medicine institute in Cambridge.

She has a research interest in the philosophy of physics, especially as it relates to chemical-biological interfaces in the contexts of human and social systems.

She is actively looking for collaborators.

Crucible Theme: Emergence

Mick Gower

Mick is a member of the CoDE institute at [Anglia Ruskin University](#)

Major project: [European Storytelling Archive](#)

Mike Higton

Mike is based in the Faculty of [Divinity](#), where he directs the Cambridge Inter-Faith Programme. He is principal investigator of the [Online inter-faith dialogue platform](#) project.

<http://www.interfaith.cam.ac.uk/>

Mo Syed

Mo is a PhD student in [Social Psychology](#), jointly supervised by [David Good](#) and [Alan Blackwell](#). He is investigating collaborative processes within interdisciplinary design teams, especially as they relate to the representation of social phenomena as a component of engineering design activity.

Nancy Foster

Nancy Fried Foster is a design anthropologist, specialising in participatory design for academic contexts, supporting scholarly practices. She is based at the University of Rochester, where she contributes to the design of information systems and building architecture.

Personal page: <http://urresearch.rochester.edu/viewResearcherPage.action?researcherId=25>

In Cambridge she provided an introduction to user-centred and participatory design practices for an invited discussion on "Working with users to produce better software for academia", preparing for publication of results from the Crucible project [Groups in academia](#).

Natasa Milic-Frayling

Natasa is a Principal Researcher at Microsoft Research Cambridge. Her research interests are in how people find, use and create digital content within broad social and organisational contexts. She leads development of technical concepts and research strategy for the Integrated Systems Group at MSRC.

Personal web page: <http://research.microsoft.com/en-us/people/natasamf/default.aspx>

She has led several projects involving Crucible members:

- [Web content on small screens](#)
- [Web usage in local government](#)
- [Returning to online locations](#)

Nathan Crilly

Nathan is a University Lecturer in the Cambridge Engineering Design Centre. His interests are in the areas of industrial design, product aesthetics and consumer response. In particular, he is focusing on the potential for product appearance to act as a medium of communication between designers and consumers. Nathan holds a bachelor's degree in Mechanical Engineering, a PhD in Product Aesthetics and has professional experience in the fields of aerospace design, materials research and information technology. More information can be found at Nathan's research homepage [\[1\]](#).

Crucible Projects:

- [Philosophy of function](#)
- [Strategy roadmaps](#)
- [Design intent](#)
- [Shared agency in computer use](#)
- [Empirical product aesthetics](#)
- [Graphic elicitation](#)

[Crucible Theme: Visual representation](#) [Crucible Theme: Sketching as a design practice](#)

Neil Dodgson

Neil is Professor of Computer Graphics in the Rainbow Group of the Computer Laboratory.

Crucible projects include:

- Computational aesthetics
- CREATOR network
- Digital culture in society

Nicholas Cook

Nick is 1684 Professor of Music in Cambridge. He has published several books of relevance to Crucible research themes, including *Analysing Musical Multimedia*, *The Cambridge History of Twentieth-Century Music*, and *Music as Performance: New Perspectives Across the Disciplines*.

Crucible projects:

- Member of advisory board for Improcess
- Co-supervised Untraditional Folk project by Rachel Sweeney

Nick Collins

Nick completed a PhD at the Centre for Music and Science in Cambridge, supervised by Ian Cross and Alan Blackwell. He is now a lecturer at the University of Sussex, where he directs the Music Informatics degree programme. He is a well-known exponent of Live Coding, and was a founder of the live coding group TOPLAP.

He is author of the popular textbook Introduction to Computer Music.

<http://www.cogs.susx.ac.uk/users/nc81/>

Crucible projects:

- Improcess
- Computational aesthetics
- Collaborative performance technology
- Digital culture in society

Alan Blackwell Research Theme: Computer Music

Crucible Theme: Music technology

Nick Rothwell

Nick is an artist-programmer based in London.

Crucible projects / collaborators:

- Jane Turner
- Choreographic Language Agent
- Programming as craft

Norman MacLeod

Norm is Keeper of Palaeontology at the Natural History Museum in London.

Crucible projects:

- Coded Chimera
- Taxonomic inference

Pam Burnard

Based in Cambridge Faculty of Education

Educational researcher on Sonic Pi projects.

Organiser of Intercultural Arts conferences.

Patrick Wollner

PhD student in the Engineering Design Centre, working on cognitive user models.

Leader of [The Mephistophone](#) project.

Paul Crank

Paul is a director of Cambridge-based graphic design agency [Catalyst Design](#)

Crucible projects include:

- [Low literacy interaction](#)
- [Returning to online locations](#)

Paul Fletcher

Paul is Bernard Wolfe Professor of Health Neuroscience in the Cambridge Department of Psychiatry.

Crucible projects:

- [Technology for mental health](#)
- [Cheryl Frances-Hoad](#) (composer in residence)
- [Empirical product aesthetics](#)
- [Shared agency in computer use](#)

Per Ola Kristensson

Per Ola has held research fellowships in the Inference Group with [David MacKay](#), and in the Rainbow Group with [Alan Blackwell](#). He is now a lecturer in Computer Science at the University of St Andrews.

Crucible projects:

- [Dasher](#)
- [Ethics in technology](#)
- [Shared agency in computer use](#)

Pete Calvert

Now a PhD student in the [Computer Laboratory](#), Pete was a member of the team for the project [ReadYourMeter.org](#)

Peter Cook

Peter was studio manager at [CUMIS](#), and subsequently managed the video production team at [CARET](#).

Peter Landshoff

Peter was one of the initiators of the [Flagship Retrofit](#) project.

Peter Robinson

Peter is Professor of Computer Technology in the [Rainbow Group](#) of the [Computer Laboratory](#)

Crucible projects include:

- [CREATOR network](#)
- [Performance capture](#)
- [Drawing at a distance](#)
- [Digital culture in society](#)

[Crucible Theme: Human-Computer Interaction \(HCI\)](#)

Peter Tregear

Peter spent several years in Cambridge working as a conductor (especially of opera), director of studies, college lecture and affiliated lecturer in Music. Since returning to Australia, he has engaged in a number of

entrepreneurial educational and arts management initiatives.

Projects:

- [Maschinist Hopkins](#)

Peter Tyler

Pete is an economist in the Cambridge department of [Land Economy](#), with a special interest in innovation and technology.

Crucible projects include:

- [New Century Cities](#)
- [Public value from technology in the arts](#)
- [Digital culture in society](#)

Phil Barnard

Phil is a cognitive scientist, having held posts at the MRC [Applied Psychology Unit](#) and [Cognition and Brain Science Unit](#).

Crucible projects include:

- [Choreographic Language Agent](#)
- [Choreography and Cognition](#)

[Crucible Theme: Dance research](#)

Phil Cowans

Phil was a PhD student and postdoctoral researcher working with [David MacKay](#) on the [Dasher](#) project. He developed the initial prototype of the [Talks.cam](#) system.

Qin Jingyan

Qin Jingyan is an Associate Professor in the Industrial Design Department at the Beijing University of Science & Technology.

She was funded by the Chinese government to visit Crucible, conducting comparative research comparing [design education in the UK and China](#), and design contributions to sustainable creative industries.

[Design education \(Crucible theme\)](#)

Quentin Stafford-Fraser

Quentin is a PhD graduate of the [Rainbow Group](#), and designed interactive systems at the [Xerox EuroPARC](#) and [AT&T](#) laboratories in Cambridge before establishing [Newnham Research](#).

Projects associated with Crucible include:

- [Ndiyo](#)
- [Bridging the Global Digital Divides](#)
- [Drawing at a distance](#)
- [VNC video wall](#)

Rachel Drury

Rachel is a Creative Producer and Freelance Arts Consultant based in Cambridge. She is currently working with arts leaders, HEIs and technology companies, on a proposal to enhance collaboration between Cambridge's internationally renowned technology innovation hub and the arts. It could see Cambridge develop a USP for publicly engaged creative experimentation with artists and companies coming into the city from across the UK and beyond to collaborate with local cultural partners and technology companies to develop new skills, practices and ideas, working in close contact with the public.

From January to July 2013, Rachel was Arts Policy Researcher in residence at the University of Cambridge Computer Laboratory. During this time, as well as undertaking the research for the above proposal, she

attracted £10,000 of investment for a project that is underway with Wysing Arts Centre where five artists with differing experiences of coding are experimenting with producing new work with the Raspberry Pi. She is also working with a larger group of partners on a more significant project to use the Raspberry Pi in schools as a new musical instrument. Rachel previously worked as a Senior Manager at Arts Council England where, amongst other things, she worked on major investment partnerships with regional development agencies, local authorities and other partners that were designed to catalyse the cultural offer in places by building on indigenous strengths.

Crucible Projects:

- [Creative Cambridge](#)
- [Defining Pi](#)
- [Sonic Pi: Live and Coding](#)
- [Performance Programming](#)

Organisations:

- [Collusion](#)

Rachel Hewson

After completing a PhD investigating [Marking and Making](#) funded by [Xerox EuroPARC](#) and supervised by [Marian Petre](#), Rachel was employed as a postdoctoral researcher in the [Rainbow Group](#) with funding from the [Cambridge-MIT Institute](#) to develop the initial portfolio of Crucible projects.

Crucible projects:

- [Across Design](#)
- [Collaboration and Ownership in the Digital Economy](#)
- [Distributed design studio](#)
- [New Technology Arts Fellowships](#)
- [Design approaches to drug discovery](#)

Rachel Jones

Rachel is founder and director of Cambridge-based user experience research company [Instrata](#).

Crucible projects include:

- [Web usage in local government](#)
- [Returning to online locations](#)

Rachel Sweeney

Rachel was responsible for the [Untraditional Folk](#) project, undertaken during her musicology MPhil in the [Music](#) faculty, supervised by [Nicholas Cook](#) and [Alan Blackwell](#).

Ralph Sommerer

Ralph worked on several Crucible projects while employed as a research engineer at Microsoft Research Cambridge.

- [Architectural views of information retrieval](#)
- [Web content on small screens](#)
- [Returning to online locations](#)

Crucible collaborators included:

- [Natasa Milic-Frayling](#) (Ralph's manager at MSRC)
- [Alan Blackwell](#)
- [Kerry Rodden](#)
- [Martyn Dade-Robertson](#)
- [Rachel Jones](#)

Rana El Kaliouby

Rana was the first of a series of PhD students in the [Rainbow Group](#) investigating Affective Computing technology under the supervision of [Peter Robinson](#). At the start of her PhD, she collaborated on one of the Crucible [New Technology Arts Fellowships](#) to create the affective art installation [Face Value](#) with [Alexa Wright](#).

Rana is now at the MIT Media Lab.

Rex Britter

As Professor of Environmental Fluid Dynamics in the [Engineering Department](#), Rex was one of the initiators of the [Undergraduate Research Opportunities Programme \(UROP\)](#), providing particular support for its early interdisciplinary focus.

Rhiannon Williams

As a member of staff at [CARET](#), Rhiannon contributed to several early Crucible projects.

Rhodri Karim

Rhodri's experimental investigation of musical timbre classification, supervised by [Alan Blackwell](#) with assistance from [Nick Collins](#) and [Frank Wales](#) contributed to the [Musical timbre-morphing](#) project.

Richard Harper

Richard was founding director of the [Digital World Research Centre](#) at the University of Surrey, having previously been in Cambridge at [Xerox EuroPARC](#), and is now a senior researcher at [Microsoft Research Cambridge](#).

Crucible collaborators:

- [Bronac Ferran](#)
- [Alex Oliver](#)

Richard Hoadley

Richard is a digital composer and lecturer at [Anglia Ruskin University](#), where he was a founder of the Digital Performance Laboratory. He was a coordinator of the Live Experimental Arts Performance Society (LEAPS).

Crucible projects:

- [Improcess](#)
- [Festival of Interactive Technology](#)
- [Cultures of the Digital Economy](#)
- [Diptych](#)
- [Triggered](#)
- [Collaborative performance technology](#)
- [Cambridge Digital Arts Festival](#)
- [Digital culture in society](#)

[Crucible Theme: Music technology](#)

Richard Sharp

Richard was a researcher at [Intel](#) Research in Cambridge, where he led the [Interactive optical tags](#) project.

Rob Hague

Rob was a PhD student in the [Rainbow Group](#), and a contributor to the [AutoHAN](#) project.

Rob Phaai

Based in the Institute for Manufacturing.

Crucible projects:

- Strategy roadmaps
- Human participants in technology research

Robert Aish

Robert is a specialist in architectural computing. He was head of research at Bentley Systems, and now leads research teams at Autodesk. He has served on the steering committee of the Cambridge Engineering Design Centre.

Crucible collaborations include:

- Visual design constraint overlays
- Hanna Wallach
- Alan Blackwell
- Luke Church
- François Penz
- Programming for artists

Robin Boast

Robin is Deputy Director of the Museum of Archaeology and Anthropology. He has a particular interest in the consequences of using computer systems to categorise museum collections, and has collaborated with Luke Church, Alan Blackwell and Jussi Parikka among others.

He has participated in projects including:

- Subversion, Conversion and Development
- Undergraduate Research Opportunities Programme (UROP)
- Digital culture in society

Alan Blackwell Research Theme: Critical Theory

Rory McCann

As an undergraduate in the Computer Laboratory, Rory worked in a post funded by the Undergraduate Research Opportunities Programme (UROP), creating and evaluating prototypes for Energy use visualisation with funding from the Flagship Retrofit project.

Crucible Theme: Motivation and behaviour change

Rosaleen McCarthy

Roz is a Consultant Neuropsychologist at Southampton University Hospital, and was previously in the Cognitive Neuropsychology Unit of the Department of Experimental Psychology.

She was Principal Investigator for the inaugural Choreography and Cognition project, leading to the Random Dance production AtaXia, drawing on her clinical experience.

Saar Drimer

Saar is an electronic artist/designer, founder of Boldport <http://www.boldport.com/>

Projects:

- Button brain

Sabrina Bresciani

Sabrina is a lecturer at the University of St. Gallen in Switzerland. She carried out the Visualisations for collaborative work project in Cambridge while completing her PhD with Martin Eppler.

Saeed Aghaee

Saeed is a post-doctoral researcher in the Rainbow Group, funded by a Swiss post-doctoral mobility

fellowship.

Projects:

- Mashing up the Internet of Things
- Location-based IoT discourse
- Personality and programming

Sally Fincher

Sally is a lecturer in the Computing Laboratory at the University of Kent where she teaches and researches in Computer Science Education and Human Computer Interaction. An area of especial interest is the use of Patterns and Patterns languages to describe design expertise and to scaffold the transfer of design knowledge.

Her book on project work in Computer Science, co-edited with Marian Petre, was an important source for development of the Cambridge Group design projects: Computer science project work: Principles and pragmatics. Sally Fincher, Marian Petre, and Martyn Clark. Springer-Verlag, January 2001.

Crucible Theme: Design education

Sally Jane Norman

Founding director of Culture Lab Newcastle, Sally Jane is now Director of the Attenborough Centre for the Creative Arts at the University of Sussex

<http://www.sussex.ac.uk/profiles/240005>

She collaborated with Crucible members on several projects within the CREATOR network, and was a key collaborator in the Crucible/ARU Digital Culture Hub:

- Programming as craft
- Performance capture
- Digital culture in society

Sam Aaron

Crucible collaborator, based in the Computer Laboratory as a research visitor in 2010/11, and subsequently as a member of research staff, now generously funded by the Raspberry Pi Foundation.

Crucible projects:

- Sonic Pi: Live and Coding
- Improcess
- Performance Programming
- Sonic Pi
- Defining Pi

Samantha Rayner

Sam runs the Masters programme in Digital Publishing at Anglia Ruskin University, and is co-Director of the Cultures of the Digital Economy institute.

Samuelle Carlson

Samuelle was a PhD student in Social Anthropology, who was a member of the team for the Social Property and New Social Forms project, and worked with James Leach on the evaluation of the Arts Council of England project Interact Artists in Industry.

Satinder Gill

Satinder was a visiting researcher in the Rainbow Group, and has also collaborated with the Centre for Music and Science, and Cultures of the Digital Economy research institute in a collaboration with Jane Turner. Satinder created the edited transcript from the Computational aesthetics workshop. She has special interests in embodied interaction, and in interdisciplinary arts research.

Other Crucible collaborators include [David Good](#), [Cecily Morrison](#), [Shazia Afzal](#) and [Phil Barnard](#)

Scott deLahunta

Scott is a Research Fellow at Dartington College of Arts who researches the relationship between performing arts and emerging technologies with a particular interest in radical cross and interdisciplinary practices. He works in affiliation with a number of European institutions in roles that vary from advisory to project development and management. With a background in professional dance, he is currently working on a new Masters in Choreography with a focus on technologies in Amsterdam.

Crucible projects:

- [New Technology Arts Fellowships](#)
- [Choreographic Language Agent](#)

Scott Whittaker

Scott's experimental investigation of granular synthesis, supervised by [Sam Aaron](#) contributed to the [Musical timbre-morphing](#) project.

Seb Wills

Seb was a PhD student of [David MacKay](#), and subsequently worked on the [Ndiyo](#) project.

Sebastian Macmillan

Sebastian is an architect who specialises in interdisciplinary collaboration in the construction industry. He was a senior researcher at the [Martin Centre](#), directs the masters programme in [Interdisciplinary Design for the Built Environment](#), and was one of the initiators of the [Across Design](#) project.

Sharath Srinivasan

Sharath is Director of the [Centre of Governance and Human Rights](#), in the Cambridge Department of [Politics and International Studies](#).

Crucible projects:

- [ICT, civil society and bottom-up governance](#)
- [FrontlineSMS:Radio](#)
- [Design for humanitarian relief](#)

Simon Biggs

Simon is an artist working with new media within an interdisciplinary research oriented practice. Many of his works employ interactive systems and behavioural programming. He produces interactive installations, network projects and works employing new materials. He is also active as a writer on new media arts and as a curator. He is currently Professor of Art at Edinburgh College of Art.

Crucible projects:

- [Reactive materials in public art](#)
- [New Technology Arts Fellowships](#)
- [Art and science research fellowships](#)
- [Autopoiesis: novelty, meaning and value](#)

Simon Godsill

Simon is Professor of Statistical Signal Processing in the Cambridge University [Engineering Department](#). He has contributed to several Crucible proposals in the area of music signal processing.

[Crucible Theme: Music technology](#)

[Crucible Theme: Machine learning](#)

Simon Laughlin

Simon is a Professor in the department of Zoology, and was one of the editors on the Work Meets Life project.

Simon Lewis

Simon's Cambridge-based consultancy trades as "Conceptual Simplicity". He is a specialist in usability of energy interfaces. He collaborates with Crucible members on Energy use visualisation.

Crucible connections:

- Richard Harper
- Alan Blackwell
- William Box
- David Good

Simon Peyton Jones

Simon worked with Margaret Burnett and Alan Blackwell on a project at Microsoft Research Cambridge extending the user interface of Excel to accommodate more fundamental computation components of functional programming languages.

He is a member of the advisory board for the Improcess project.

Stephen Allott

Stephen is Crown Commercial Representative in the Cabinet Office with special responsibility for technology SMEs. He is a specialist in establishing effective relations between researchers and technology companies, and has been founder and board member of multiple startups. He was a founder of the Computer Lab Ring, and was closely involved in the initial Crucible strategy, especially as it related to the Cambridge-MIT Institute. He was one of the expert contributors to the Interdisciplinarity and Innovation project.

Crucible Theme: Policy research

Stuart Taylor

Stuart is a research engineer at Microsoft Research Cambridge, and also performs as a VJ.

He organised the Performing with Gadgeteer workshop, and has participated in Crucible projects including:

- Improcess
- Festival of Interactive Technology
- Coded Chimera

Susan Watts

Susan has been at the forefront of science and technology journalism for nearly two decades, on the BBC's Newsnight programme, helping to shape some of the most important national and international debates in science, technology, engineering, medicine and health. She has explored their many ramifications - political, social and economic - through compelling and engaging television, radio and digital content, in news and documentaries.

An experienced journalist, writer and broadcaster, Susan is working with the University of Cambridge Emerging Leaders' Development Programme and Post Doc Society on "Straight Talking" workshops that show the power of direct communication. She is keen to explore new ways to prompt cross-discipline collaboration between researchers, through participative masterclasses, workshops, debates and other forums.

With contacts throughout industry, government and academia, Susan is in touch with the latest research and development, and maintains a keen knowledge of the interplay between STEM subjects and public policy-making.

Tamsin Mann

Tamsin was a key advocate for Crucible in the Cambridge University Research Office, where she was responsible for a variety of interdisciplinary initiatives, and engagements with the Arts and Humanities. She managed the [Digital Resources in the Humanities and Arts](#) conference, and was would have been the manager of the [Digital culture in society](#) research hub.

[Crucible Theme: Digital Humanities](#)

Tanja Schomann

PhD student in Psychology, supervised by [David Good](#) and [Alan Blackwell](#)

Tariq Khokhar

Tariq was a member of the team at [Aptivate](#), where he contributed to the [Critical Care for the World](#) project.

Theresa Marteau

Theresa is Director of the Behaviour and Health Research Unit at the [Institute of Public Health](#) in Cambridge, and Professor of Health Psychology at the Institute of Psychiatry, King's College London.

Crucible projects:

- [Empirical product aesthetics](#)

[Crucible Theme: Motivation and behaviour change](#)

Thore Graepel

Thore is a machine learning researcher at [Microsoft Research Cambridge](#).

Crucible students who have carried out research projects in his group include:

- [Martin Rohrmeier](#)
- [Michal Kosinski](#)

Tim Regan

Tim works in Microsoft Research Cambridge in the Socio-Digital Systems Group. His research interests are in social software and mobile media. He previously worked on "shoulder to shoulder" computing (applications for several users to interact with, when together in the same room), online virtual worlds, systems architecture, and formal methods. He holds a doctorate in Theoretical Computer Science from The University of Sussex.

Crucible Projects:

- [Improcess](#)
- [HCI theory group](#)
- [Untraditional Folk](#)
- [Festival of Interactive Technology](#)
- [Digital culture in society](#)
- [Mobile cloud](#)
- [From creators and critics to communities](#)
- [Performing with Gadgeteer](#)

Ting-Ray Chang

Ting-Ray is a PhD student in the [Engineering Design Centre](#), supervised by [Nathan Crilly](#) and co-supervised by [Alan Blackwell](#). She is exploring [Co-design in hospitals](#).

Tom Drummond

Tom was a lecturer in the [Engineering Department](#), conducting research funded by [Boeing Corporation](#)

Tom Hall

Tom is a digital composer based at [Anglia Ruskin University](#), in their [Digital Performance Laboratory](#) within the [Cultures of the Digital Economy](#) institute.

Crucible collaborations:

- [Improcess](#)
- [Festival of Interactive Technology](#)
- [Diptych](#)
- [Triggered](#)
- [Collaborative performance technology](#)
- [Digital culture in society](#)

Tom Ling

Tom Ling heads up the evaluation team at RAND Europe, based in Cambridge. His research is focused on multi-faceted and sometimes complex interventions. Much of this is on health interventions where current work includes studies of integrated care, clinician engagement in quality improvement, and the interconnections linking research with practice. These are frequently and necessarily interdisciplinary. He is also interested in how evaluative evidence is (or is not) used to support learning and accountability. On a related issue he is interested in scenario thinking in supporting both strategy and evaluation.

Crucible research theme interests:

- [Crucible Theme: Interdisciplinary collaboration](#)
- [Crucible Theme: Healthcare IT](#)

Tom Whitehead

Tom carried out technical work on the [Taxonomic inference](#) project, with funding from the [Natural History Museum](#) under the [Undergraduate Research Opportunities Programme \(UROP\)](#).

Tommy Nilsson

As a masters student at Umeå Institute of Design, Tommy's final year project was carried out in Cambridge, supervised by [Alan Blackwell](#).

- [Seamful museum experience](#)
- [Darwin Tree of Life](#)

Tris Bracey

Tris was an Engineering student who spent a summer working in the [Computer Laboratory](#) under the [Undergraduate Research Opportunities Programme \(UROP\)](#)

Project: [Interaction with musical polytempi](#)

Vania Sena

Vania is head of the Marketing, Entrepreneurship and Global Strategy group at the University of Essex, and director of the ESRC Business and Local Government Data Research Centre. The Centre focuses on the analysis of large and complex (mostly governmental and business) datasets. The centre's main purpose is to advance methodologies in this field, showcase them with some meaningful research around regional growth and provide some "solutions" which can support local policy-making and business growth.

Project leader for:

- [Advice consultations online](#)

Verity Allan

Verity is on the staff of [CARET](#), where she has responsibility for user issues on systems including [Talks.cam](#) and [CamTools](#). She is a member of the team on the [Groups in academia](#) project.

Vilius Naudziunas

Vilius is a PhD student in the [Computer Laboratory](#).

He was a member of the team for the [Making mobiles tangible](#) project.

Wayne MacGregor

Wayne is a choreographer and founder of Random Dance, whose creative practice regularly involves collaboration with researchers. Random Dance R-Research, directed by [Scott delaHunta](#) has conducted a series of research projects in collaboration with Crucible.

Crucible projects include:

- [Art and science research fellowships](#)
- [Choreography and Cognition](#)
- [Choreographic Language Agent](#)
- [From creators and critics to communities](#)

[Crucible Theme: Dance research](#)

William Box

Bill is founder and principal of Carnego Systems, a company taking a systems approach to building design, with an explicit recognition that people are the key components of both the design process, and the operational built environment. He has previously worked for BT Syncordia, Nortel, Carillion and Laing O'Rourke. Current projects at Carnego focus on behaviour change and energy usage in building systems.

Bill directs the [Flagship Retrofit](#) project.

William Newman

William was a pioneer of interactive computer graphics, and a member of the research staff at Xerox PARC. He came to Cambridge as one of the founders of [Xerox EuroPARC](#). After the closure of EuroPARC, he worked on several Crucible related projects at [Microsoft Research Cambridge](#).

Zhen Bai

PhD student in the [Rainbow Group](#), working on [Symbolic play in augmented reality](#).

Zoë Svendsen

Zoë is a theatre director, dramaturg and translator.

As Director of METIS (www.metisarts.co.uk), she collaborates with other artists to create interdisciplinary projects that utilise small spaces to create immersive audience experiences. These have focussed on contemporary political subjects such as capitalism and poker; climate change; the relation between the real and the virtual. Directing/writing projects include 3rd Ring Out (UK tour 2010-11 www.3rdringout.com), which received a TippingPoint Commission Award. As dramaturg she works regularly with institutions such as the Young Vic. Zoë is also Associate Artist with Company of Angels, a script reader in the literary department at the National Theatre, and an honorary research fellow at Birkbeck's Centre for Contemporary Theatre.

Drawing on her extensive professional theatre experience, Zoë's current practise-based performance research focuses on dramaturgy and the concepts of 'rehearsal' and 'attention'. With Dr. Raphael Lyne (English) and Dr. Greg Davis (Experimental Psychology) she is currently developing a research project exploring the relationship between visual attention, subjectivity, text and spatiality in Renaissance drama, using a practice-based approach.

Zoë is currently collaborating with artist and video/set designer Simon Daw (www.simondaw.com) to create a performance installation out of an ongoing investigation of intention, attention, competition and the relationship between body and machine. The project is nominally titled The Fencing Project, due to its having an invented sport at its heart, inspired by some of the feints and form of fencing. See <http://metisarts.co.uk/fencingproject/> for further information.