The Edinburgh Strategic Alliance (ESA) Research Projects 2018

A joint research endeavour between The Edinburgh School of Architecture and Landscape Architecture, University of Edinburgh and The School of Energy, Geoscience, Infrastructure and Society, Heriot-Watt University.
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The Edinburgh Strategic Alliance (ESA)

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The Edinburgh Strategic Alliance (ESA) is the joint research endeavour of The Edinburgh School of Architecture and Landscape Architecture (ESALA, University of Edinburgh) and The School of Energy, Geoscience, Infrastructure and Society (EGIS, Heriot-Watt University).

The ESA is built on interdisciplinarity and on maximising the benefits gained from working at a range of scales and approaches regarding the built environment and the urban. It enables complementary as well as collaborative research by incorporating under one umbrella a diversity of research approaches and fields that are vital for understanding and transforming our built and natural environment. We explore processes, places and spaces over the whole life cycle, from planning to design, construction and usage. Together, we investigate the social, economic and political forces and processes which shape our world and the impact that our built and natural environments have on our health, wellbeing and resilience, our ability to understand our past and to plan our sustainable futures.

For REF2014, ESA prepared a first joint submission, which is the point of departure for the forthcoming REF2021. The joint submission was second in the UK for research power. The ESA has a joint Alliance Research Committee to foster excellence in research and support a range of techniques and approaches to enquiry. We have strategy-formulating away days and focused meetings for the early exchange of information on particular research themes. We are dedicated to developing the talent of postgraduate research students and early career researchers. Opportunities range from working on large, multi-institutional, Research Council-funded studies to taking a leading role on our Kick Start projects. First announced in 2011, the Kick Start programme was developed to stimulate innovative cross-university and multidisciplinary research, and with each project involving both Edinburgh and Heriot-Watt researchers.

This book is the second iteration of a research annual, a compendium of current research carried out across the ESA. In its current state it is partial – it does not reflect in a comprehensive manner the entire breadth of research carried out in our two schools. It does not present our research centres and their activities nor does it include all relevant researchers or research projects. However, it does provide an overview and detailed sampling of much of the research at the ESA in 2018. Further information including a comprehensive list of research outputs can be found on the schools’ websites.
STREAMLINES, VORTICES, AND PLUMES: ENVIRONMENTAL MODELS AND THEIR SHIFTING TARGETS

This research by design project uses case study analysis and model prototyping processes to investigate how physical models that materialise fluid environmental processes, such as air and water flow, act as generative architectural design tools.

Environmental models such as heliodons, wind tunnels, and water tables are generally understood as distinct from the architectural models they test. Architects conventionally design building models that are tested within environmental chambers, built and operated by building scientists or engineers, to yield quantitative insights about environmental performance. This research collapses the distinction between the apparatuses simulating environmental processes and the architectural models they test and explores the potential for both combined to act as contemporary environmental design tools.

Three historic environmental case study models – Étienne-Jules Marey’s wind tunnels (1900–2), Victor and Aladar Olgyay’s thermostheliodon (1955–63), and Alan Berger’s Wetland Machine model (2008) – contextualise the sources of certain persistent issues that continue to inform environmental design in architecture today. Physical prototyping of wind tunnels, water tables, and filling tanks, which simulate pressure and buoyancy driven airflow, give shape, form, and force to fluid environmental processes in turn, allowing them to give shape and form to architectural designs. Both text and design-based research investigate the dialogic relationship between environmental representations and their targets, the environmental systems they represent.

Related publications:
LANDSCAPE CHANGE: READING RURAL LANDSCAPES, ACTIONS AND INTERACTIONS

This project tests the significance of ‘reading’ rural landscapes more deeply so that inherent cultural and environmental complexities are represented together in a form that carries meaning to wider audiences.

Landscape is thick and thickening, composed of, and in constant aggregation with, layer upon layer of natural and cultural history. All too often when ‘planning’ and ultimately ‘change’ is considered in a rural landscape its depth is not read and communicated and therefore not understood.

This work began through the creative agenda of the Valentine Project: a collaborative investigation between an artist and a landscape architect and the subsequent invention of a form of landscape representation, a form of graphic archaeology able to engage with past, present and future in a given terrain. The project and collaborative enquiry began in 2013 and continues.

The work seeks to discover complementary strategies to landscape planning in its current form whereby drawing (as a deliberately ambiguous act) and interdisciplinary collaborative practice is used to question protocol and convention by tracing the invisible and forgotten ‘readings’ of a landscape in order that the realities and possibilities of a ‘human’ interaction might be better perceived and better understood. The consideration of how to represent the dynamic nature of landscape, so often overlooked within the conventions of landscape planning documentation, is a recurring fascination in the work.

The Valentine Project originated in a 2013–14 Creative Scotland/ University of St. Andrews Year of Natural Scotland funding call, “Imagining Natural Scotland”, which invited participants to engage with the politics of the representation of land in Scotland.

Output:
2013 Imagining Natural Scotland – The Valentine Project. A video of the conference presentation given on 27 August 2013:
https://vimeo.com/75010502

Related publication:
This work examines the co-authoring potential of drawing, three dimensional modelling and film-making with local people to support scientific procedures of hazard mapping towards disaster risk reduction.

Developing shared knowledge of a landscape between locals and experts can mediate ideas between people towards action. In 2017 this work was situated in the active volcanic landscapes of Guatemala with a specific focus on Volcán de Fuego.

The research searches for methodologies to capture and communicate local knowledge of ‘place’ in order to contribute meaningfully to scientific procedures of mapping hazard and risk. In her role within the project, Lisa seeks to comprehend the power of eidetic readings of place to represent the complexity of volcanic landscapes as localities of hazard, and also as places of dwelling and livelihood.

As a discipline, Landscape Architecture sits between the social and environmental sciences. Procedural enquiries in landscape architecture have the potential to negotiate between different, and frequently conflicting, research agendas. Landscape Architects seek to communicate the often invisible relationships that exist in a landscape, and can devise representational strategies that can communicate both social and environmental change in a landscape through time. The project searches for new ways to advance the agency of the hazard map, considering that its influence is limited, due to reliance upon the expertise of its reader. The research aspires to investigate indeterminate methods of representing a landscape recording both human and nonhuman associations that can advance knowledge beyond static and reductive interpretations.

Outputs to date:

2017 Workshop, Antigua, Guatemala, Volcán de Fuego.


INNOVATIVE FABRIC FORMED CONSTRUCTION AT EDINBURGH GATEWAY

Edinburgh Gateway is a new interchange station on the outskirts of Edinburgh connecting the Fife railway line with the tram network.

The station was commissioned by Network Rail and carried out by Balfour Beatty. Work on the station commenced in April 2015 and was completed in December 2016.

Seeking to contribute to Network Rail’s forward-looking vision for Edinburgh Gateway, the proposal involved both an installation and landscaping to reflect the themes of urban biodiversity, sense of place, innovative construction, and community engagement.

The final outcome consisted of two main parts – a series of concrete wall panels designed by local school children, and a set of concrete ‘trees’ as a part of the landscaping at the entrance of the station.

All the pieces were constructed using fabric formwork techniques. All the pieces were produced in the ESALA workshops.

The theme of engagement was facilitated through Concrete Scotland by connecting and involving local schools in the project. ESALA had worked with local schools before, most notably with the development of a fabric formed concrete installation at Castleview Primary School.

CS has developed an educational resource for secondary schools called ‘Concrete in the Classroom’ to stimulate pupils’ interest in materials and construction. Two schools, Inverkeithing High School and Queensferry Community High School, were invited to participate in the development of a series of decorative panels exploring the themes of place and bio-diversity.

The selection of each school was important, as they represented both the north and south banks of the River Forth, the principal direction of the main line from the station.

A total of 48 panels was produced and installed onto steel frames located on the pedestrian route to the Gyle shopping centre. Each panel was of unique design. Some required the development of new techniques and processes.

At over 4 metres in height the concrete ‘tree’ was the largest produced by ESALA to date. The geometry was based on the birch trees with two large pieces bending and tapering over their height.

Although there is now an established international research field in fabric formed concrete, the take-up by the industry is slow. Similar panels and the columns could be possible using conventional techniques, but would be much more expensive and with very long lead in times. Projects such as this demonstrates that fabric formwork is in fact a disruptive technology.

The station was opened by the Scottish Minister Humza Yousaf on 9 December.
Rivers sourced from the Himalaya irrigate the Indo-Gangetic Plain via major river networks that support approximately 10% of the global population and their livelihoods.

However, many of these rivers are also the source of devastating floods. The project, funded by the NERC, is a collaboration between an interdisciplinary team of geoscientists, engineers, social scientists and architects from the University of Edinburgh, alongside practitioners from the NGO Practical Action and the Nepal Department of Hydrology and Meteorology. The teams applied technologies and conducted research with communities, to better understand flood risk in the Karnali river basin, Terai, Western Nepal.

ESALA was involved specifically to consider and study indigenous local knowledge and traditional practices in building along the flood plains. Such knowledge and practices are necessary in developing resilience to both recurring and extreme flood events exacerbated by climate change.

Vernacular construction techniques are inherently specific to location, available material, and skill, having evolved through generations by custom and practice. Nepal has many examples of flood resilient construction. Nevertheless, they are often displaced by more modern techniques and materials, predominantly reinforced concrete, such as flood refuge platforms. The resilience of these buildings can be verified in engineering terms more easily than comparable vernacular designs. However, these systems require different skills, technical expertise, and much higher levels of finance.

The research involved a short but intensive field-study of construction practice in the Karnali river plain. A range of settlements in the area were visited to observe and discuss construction methods and attitudes to developing practice, including flood refuge buildings, with local communities.

Appropriate vernacular construction can provide culturally appropriate resilience, but does require knowledge to be shared and transferred between communities; the poorest communities may not have access to either the vernacular knowledge or the materials. Further research is necessary to fully understand the economic and skills barriers to self-development among certain communities.
Architectural challenges in the sharing economy

Cryptocurrencies, blockchain technology, and other aspects of the sharing economy offer benefits and challenges for architecture. They also furnish metaphors about urban living. This research evaluates and investigates opportunities for the application of peer-to-peer technologies in the area of computer-aided design and building information modelling.

Related publication:

In my work, I bring the related themes of place and digital technologies into collision with recurrent topics of global concern. Since the 1990s I have addressed artificial intelligence, technoromanticism, e-commerce, sound, emotion and now nature.

Nature is on the side of the independent, the hopeful, the free, the good and the healthy. Some digital device users think that technology gets in the way of direct access to nature. It is as if urban dwellers are burdened by relentless connectivity, work stress, boredom, and poor health. So, they look to nature to deliver the opposites of these detrimental conditions. It is easy to succumb to the view that nature is what is left in the crucible of human experience purged of bothersome technology and artifice.

From this observation I launch into a discussion of the nature-artifice divide and situate it within the world of digital networks, with an emphasis on semiotics, the communicative structures within all things, according to the philosopher Charles Sanders Peirce and his followers.

Three books take us on a journey through the place of emotion, mood, attunement, biophilia, big data, bio- and geo-semiotics, bio-hacking, biomimetic design, nature games, zoo-space, refuge, numinous nature and myths of self-reliance. Signs are crucial in understanding the environment and the complex discourses it entails. Semiotics supports this challenge, a theme addressed critically in a text on C.S. Peirce in the Thinkers for Architects series.

Related publications:
KNOWLEDGE BY OTHER MEANS: DATA-DRIVEN MACHINIC EPISTEMOLOGIES

Knowledge by Other Means is an epistemological exploration of data-driven drawing processes as carried out by a custom-built robotic apparatus, identifying non-computable elements of thought in the development of spatialized digital intelligence.

Half a decade past the consolidation of the first ‘Digital Turn’ in architecture, contemporary designers seem to have decidedly embraced the unprecedented power of machinic thinking, subsequently adopting its embedded logical processes. We may, however, pose a critical question in the context of this ‘second computational turn’: Are there any non-computable elements of thought in the development of spatialized digital intelligence?

In answering this question, the project unpacks a series of productive relationships intersecting drawing and the passing of time, operating at various scales and developed in the context of a data-driven design environment.

More specifically, this enquiry looks into the processes carried out by a custom-built robotic drawing machine, tracing dynamic vector data streams collated from a variety of spatial sources. This hybrid digital-analogue apparatus draws from a long historical lineage of vector-based machinic systems designed for architectural drafting. Situating themselves between the human hand and the surface of the paper, those machines acted as carriers of embodied spatial knowledge that could be selectively actualised into specific design processes and materialisations.

Deploying a range of intertwined digital and analogue media, this machinic environment is used to articulate a data-based drawing research practice and a subsequent ‘anexact’ drawing research methodology that further elaborates on the durational and multiplicitous aspects of the data-based drawings. This body of work is reflected on as a visual research methodology, which taps into Bernard Cache’s interest in architectural computation as a way to pursue philosophical knowledge ‘by other means’ and into Gilbert Simondon’s notion of the ‘technical ensemble’ emphasising the productive forms of indetermination emerging from its internal informational transfers.

Related publications:

PROTOTYPES OF DISSERT: SUBVERTING DATA-BASED DESIGN PRACTICES TO RECONSTRUCT THE PUBLIC DOMAIN(S)

This project critically addresses techno-informational practices gravitating around the notion of ‘sensing’ and focusing on the development of physical, real-time responses to ‘sensed’ data streams within the specific context of urban public space.

Among contemporary fields of spatial practice, urban design and governance have undergone particularly radical transformations thanks to the gradual incorporation of digital computation technologies. The most salient case of this resulting methodological shift is the Smart City paradigm, which exemplifies the conceptual framework championed by technocratic, data-driven approaches to the development of spatial intelligence in the urban field. However this framework is a problematic one: It operates under a decidedly top-down regime, and articulates mechanisms of representation that tackle the city as a singular ‘assembled whole’ where individual subjectivities are averaged and the drawing (and subsequent controlling) of ‘flow’ is foregrounded as an imperative of maximum optimisation.

Taking an interdisciplinary approach that draws from the fields of Anthropology, Design Informatics and Urban Studies, this project asks: Is it possible to articulate data-based counter-practices that operate within the same computational plateau as Smart Cities, albeit explicitly subverting their narratives of optimisation, efficiency, and top-down ‘smartness’?

As a tentative response, this ongoing body of work puts forward a series of collective interventions (developed as part of the author’s academic practice) that predate the technical overlay of the Smart City to leverage both individual and shared human subjectivities in the urban public domain through a DIY technological ethos.

These ‘practices of digital dissent’ tackle issues concerning friction and collectiveness, and formalise design narratives that explicitly re-situate the locus of urbanity in the domain of the commons, re-establishing the ‘Smart Citizenship’ of granular human subjectivities as the main operator within the urban milieu.

Related publication:
Co-design is a complex process. It may be supported by shared representations through which diverse understandings can be brought together into a common framework.

We seek to interpret this process as realised through "Collective Imagery" workshops in which people collaborate on constructing a "collective imagery weave" installation as a representation of their emerging views on a social problem, such as village regeneration or how to improve transport for the elderly. The weave installation can be seen as the collection and transformation of data about the problem, where the processes involved can be conceptualised as connective and transformative learning among the participants. We seek to capture the data in ways that make it computationally available without destroying its implicit nature. We postulate that, when thus understood, the workshop activity can also be more effectively related to activities outside the workshop, including data sources that can be recruited via the "semantic web".

**Publications:**

**Turbinehr**

Advanced immersive VR Hub for training wind turbine maintenance apprentices.

This project develops an innovative VR technology called immersive Hybrid Reality. This system effectively blends the local real world within the virtual environment experienced by the user. This particularly enables users to see themselves (hands, legs) but also their tools, etc. This system uniquely responds to the need to develop VR technology that is compatible with the demands of trade training, mainly physical contact and manipulation, while providing the means to safely locate trainees in challenging environments.

The system is deployed in three colleges, including Fife College and Newcastle College for the training of wind turbine maintenance apprentices.

The project received numerous awards, and nearly ten mobile versions of the system have been deployed and additionally sold to our partners for use in public engagement events, e.g. to engage young people on careers in STEM subjects.

**Related outputs:**

**Website:**
http://cyberbuild.hw.ac.uk/projects-ice-IHR.html
Digital visualisation solution for in-field visualisation of Building Information Models from any location, in real-time.

The solution is a disruptive technology providing a 21st century alternative to desktop-based or VR assessment without outsourcing, remodelling or expensive proprietary systems. UrbanPlanAR solves problems of:

- Accurate urban location positioning – without the reliance on GNSS and only using affordable off-the-shelf consumer tablets
- Disenfranchised stakeholders – by creating visualisations (impact assessments) personalised to their location in real-time
- Late stage visualisation after design completion – by enabling integration and viewpoints throughout a project lifecycle at no additional cost
- Remove expensive duplication in modelling – by providing a data pipeline integrated with existing tools and flowlines from major vendors

In order to:

- Maximise reuse through existing investment in BIM and digital design
- Provide accessible understanding of impact from within local communities
- Deliver and share data for immediacy and relevance
- Create trustworthy visualisations to enable better decision making

We use localisation, augmented reality, BIM and 3D mobile technology to create software that delivers contextual information at the point of need.

Our software aligns with the beliefs and vision of leading organisations such as Architecture and Design Scotland (ADS) whose objectives are to:

- Help create better buildings, streets and sustainable places
- Encourage more people to get involved in making sustainable places
- Increase the understanding of architecture and design within the planning system
- Promote architecture and design nationally and internationally
- Provide leadership for our sector
- Deliver high-quality services which are continually improving

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Related outputs:


Websites:

- Bosché projects are at: https://web.sbe.hw.ac.uk/fbosche/index.html
- http://cyberbuild.hw.ac.uk/subjects/urbanplanar.html
IMPROVING WELLBEING THROUGH URBAN NATURE (IWUN): INTEGRATING GREEN BLUE INFRASTRUCTURE AND HEALTH SERVICE VALUATION AND DELIVERY

IWUN studies the interaction within Sheffield between people, their local natural environment and their health and wellbeing.

Improving Wellbeing through Urban Nature (IWUN) is a three-year research project as part of the Natural Environment Research Council’s Valuing Nature Programme. The project aims to find out more about how a city’s natural environment can improve the health and wellbeing of its residents, and especially those with disproportionately high levels of poor health. The city of Sheffield, UK, will be the city-wide case study and we will use a range of methods, to investigate people’s relationships with Sheffield’s parks and green spaces. These include secondary data analysis, interviews, arts-based focus groups, a specially designed smartphone app, economic analysis, and a review of existing nature based solution interventions. This will culminate in providing evidence-based decision aids for place ‘makers’, ‘keepers’ and ‘prescribers’.

IWUN consists of four work packages ranging from determining relationships between place based geographic, biodiversity, and health data; examining nature values; the power of apps to enhance noticing nature, and developing a new green paradigm to improve planning and health and social care.

Dr Sarah Payne at Heriot-Watt University contributes on work package two, which explores cultures and values of nature and health and wellbeing with a specific aim of reflecting upon a diverse society and subsequent range of values towards all forms of nature.

Website: www.iwun.uk/
Twitter: @IWUNproject
Designing and engineering soundscapes to enable restorative environments for sustainable societies.

Project DeStress is an exciting research and public engagement project exploring the connections between the sounds we hear in places (soundscapes), our ability to relax and recover (cognitive restoration) and the design of the built environment. The intention is for Designing and Engineering Soundscapes to enable Restorative Environments for Sustainable Societies.

The project will combine knowledge on the health and wellbeing outcomes from experiencing sound in quiet and calm places, and how this varies depending on the design of the surrounding buildings and infrastructure. It will first ask the public in Edinburgh, Sheffield, and Brighton and Hove to map their quiet, calm and tranquil urban outdoor areas. This will help identify the physical and social characteristics that make these places be perceived as quiet, calm, or tranquil.

A few case study sites will then be modelled to create a virtual environment where the physical infrastructure and sound sources present can be manipulated. The viewer/listener will then be able to hear the differences these changes make in the soundscape, and tell us how these differences makes them feel, before learning about how this may affect their health and wellbeing.

We want to engage with the public, planners, designers, acousticians, and decision makers to understand more about how the sounds around us (soundscapes) impact on our cognitive and emotional experiences of outdoor public city places.

Learning about the effect of the physical design of our buildings, roads, parks, and city spaces on what we hear and do in places, will help us plan and manage our city environments to be beneficial for people’s health and wellbeing and quality of life. Changes in our built environment can encourage people to stay in a place or quickly walk through it, thus we are interested in preserving those special urban places that do provide some quiet, calm, and tranquility in our vibrant, buzzing cities.

Website: www.destress.hw.ac.uk @DeStressRestore

This project explores how sharp depopulation might affect the future development of urban fabrics by means of changing the needs of individual residents towards their dwelling environments.

A conjoint analysis study has been developed to better understand if depopulation can be a factor of change in residents’ choice-making with respect to neighbourhood scenarios.

This study stems from a PhD project completed in 2016, based at the University of Edinburgh, supervised by Professor Catharine Ward Thompson, Dr. Simon Bell and Professor Peter Aspinall, and funded by the Portuguese national funding agency for science, research and technology (FCT).

Two case studies have been developed within the doctoral project’s frame, namely Lisbon and Genoa, and a third one is being developed in Glasgow.
We are also exploring how places can be designed collaboratively to support outdoor activity, health, wellbeing and community engagement as people age. Being able to get outdoors is essential for maintaining health and wellbeing into later life, but many older people find it becomes less easy, enjoyable and meaningful as they age. The Mobility, Mood and Place (MMP) research project has been exploring how places can be designed collaboratively to support older people’s outdoor activity, health, wellbeing and community engagement.

Drawing on the participation of over 900 people, most of whom were aged 60+, our research shows how innovative neuroscience methods and co-design techniques offer new opportunities to understand older people’s response to place. Among other findings, it reveals that four qualities of places really make a difference to quality of life: access for all, access to nature, access to others and access to light, that green spaces seem to be restorative, and that even a short walk can lift the mood if the environment is sufficiently varied. Particularly through our life course and archival work, MMP suggests that healthy ageing begins much earlier in life than we currently plan for, meaning that we need to take very long term views on fostering resilience for healthy older age.

The research has made a particular contribution to research-led teaching within ESALA, involving 84 students across four years of studio and site-based co-design work in London, Manchester, the Scottish islands of Orkney, and Copenhagen.

A research project exploring what makes mobility easy, enjoyable and meaningful for older people.

Mobility, Mood and Place (MMP)

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Mobility, Mood and Place has been funded by the UK Research Councils’ Lifelong Health and Wellbeing (LLHW) programme and partnered by a network of stakeholder bodies. Bringing together experts from the Universities of Edinburgh, Heriot-Watt, York and King’s College London, data collection and analysis ran from September 2013 to January 2017. The project has just completed an Impact Acceleration Award from the Economic and Social Research Council (ESRC), Habitats for Happy Ageing, in which findings and key messages were shared with audiences in policy, practice, communities, and the not-for-profit sector to drive forward change in age-friendly approaches to place.

Related outputs:


Website:

www.mobilitymoodplace.ac.uk
Do physical interventions to improve the appearance and usability of local woodlands, accompanied by community activities in the woodlands, reduce stress levels and increase physical activity and connectedness to nature in deprived urban communities?

Woods In and Around Towns (WIAT) is a Forestry Commission Scotland initiative to improve quality of life in Scotland’s urban and post-industrial areas through community access to new or regenerated woodland. In ten years, WIAT has brought 11,000 hectares of neglected woodland back into active management, created 1,400 hectares of new urban woodland and created or upgraded over 300 miles of footpaths.

Building on evidence that green spaces may positively influence mental health, our study has looked specifically at WIAT’s impact on the psychological wellbeing and stress levels of people living in deprived communities. It was designed to take advantage of WIAT as a natural experiment along Scotland’s ‘central belt’. The controlled study has involved a repeat cross-sectional survey of residents living within 1.5km of six Scottish sites: three where local woods have been changed, through new paths and signage, for example, and social programmes to encourage woodland use; and three where no changes have been made. Data has been collected in three waves: before any changes were made (2013); after physical changes were made (2014); and again after further social interventions had taken place (2015).

A health economics analysis has assessed the cost consequences of each stage of intervention in relation to outcomes such as mental wellbeing, and self-reported levels of physical activity, perception and use of the woodlands, connectedness to nature and social cohesion. The subsequent Impact project funded by the Impact Acceleration Award from the Economic and Social Research Council (ESRC), Public Landscapes for Public Health, increases our capacity for sharing findings with relevant stakeholders, from Government departments, to public agencies, local authorities and private landowners. The project has been supported by a Study Steering Group of five external advisors. Impact Acceleration Award partners include Forestry Commission Scotland, Scottish Natural Heritage, and Scottish Government. The views and opinions expressed therein are those of the authors and do not necessarily reflect those of the Public Health Research Programme, NIHR, NHS or the Department of Health.

Related outputs:


Working towards developing age-friendly cities and communities that support older adults right to age in place.

Given the rapid growth of ageing populations in many cities, the importance of developing appropriate design interventions to enable active and healthy lifestyles for older residents is more urgent than ever. Place-Making with Older Adults: Towards Age-Friendly Communities, through a comparative study of cities in Brazil and the UK, explores the role of sense of place in promoting age friendly urban spaces. Drawing on a total of 18 neighbourhoods in 6 different Brazilian (Brasilia, Pelotas and Porto Alegre) and British cities (Edinburgh, Glasgow and Manchester), the project will undertake surveys, interviews and a range of experimental methods such as ‘go along’ walks, video diaries and community mapping. The findings will help provide a clearer picture of how sense of place is experienced by older residents and how this can be incorporated into improved design and service delivery. The results will also be integrated into a variety of tools and resources to support communities, policy makers and practitioners in the development of age friendly cities.

Related outputs:

Website:
www.placeage.org/en/about

Twitter:
@placeage

Place-Making with Older Adults: Towards Age-Friendly Communities
Ryan Woolrych, participatory mapping. Image courtesy of the author.

FUNDING:
£384,745 for UK component
ESRC Urban Transformations in Brazil (Newton)

YEAR:
2016–2019

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Funding:
£384,745 for UK component
ESRC Urban Transformations in Brazil (Newton)
Expanding transnational understandings of ageing in urban environments to three case study cities in India

Population ageing and increasing urbanisation are two dominant societal trends of the 21st Century. By 2030 two-thirds of the global population will be living in cities and at least a quarter of those urban populations will be aged over 60. Developing urban environments that support and promote healthy living for older people has become a key driver of urban policy and interventions at a local and national level, resulting in planning design concepts and guidelines to support an ageing population.

However, current urban planning and development models have overlooked how environments can support a sense of place, articulated through supports for active living, social participation and making a positive contribution to the community. Ageing successfully at home and in the community requires people are able to access ‘assets and resources’ to support healthy ageing, e.g. transport, adequate housing, healthcare services, and leisure opportunities alongside social networks and opportunities for lifelong learning.

The aim of the proposed research is to expand transnational understandings of ageing in urban environments to three case study cities in India (Delhi, Calcutta, Hyderabad). This will offer a unique insight into how older adults experience ageing and place across diverse and transformative urban environments in India, providing opportunities for knowledge exchange, allowing for comparative analysis within and across case study cities in India, UK and Brazil, and identifying clear routes to policy and practice.

In answering these questions, this research builds upon an existing ESRC Urban Transformations grant (ES/N013220/1) being undertaken exploring how sense of place is experienced by older adults living in 18 neighbourhoods (of varying densities and income levels) across six case study cities in the UK (Edinburgh, Manchester and Glasgow) and Brazil (Pelotas, Porto Alegre, and Brasilia).

A community-based participatory approach will be adopted to the research, bringing together all stakeholders in a process of collaborative dialogue and co-design to challenge the hierarchical power relationships that exist when planning ‘for’ and not ‘with’ older people. The results will be used to co-create place-making tools and resources which are essential for designing age friendly environments for older adults in India that work across different cultural, social and welfare contexts. Findings will be disseminated to community, policymaker, practitioner and academic audiences through ongoing and end of project knowledge translation activities.

Opportunities are built into the project design to allow for researchers from India, UK and Brazil to come together to exchange findings, share methodological insights and shape the research process.
Harnessing innovation in city development for social equity and wellbeing – a critical proposal to build on Medellín’s experience as a model for Colombian future cities.

After decades of internal conflict, Colombia is experiencing a period of rapid economic growth and urbanisation. It remains, however, one of the most socially unequal countries in Latin America. Medellín has pioneered innovative forms of city planning and management and was acclaimed the most innovative city in the world. Hosting the World Urban Forum in 2014 allowed it to showcase its approach, key elements of which have been: creation of innovative transport infrastructure linking poorer peripheral districts to the city centre; culture-led regeneration; strong support of local development from the local business sector; and a successful municipally-owned utilities company.

However, an initial study of the implementation of this planning approach undertaken by Edinburgh and Heriot-Watt Universities with Universidad Santo Tomas shows that: the city is spreading outwards without services and employment being provided; new low-income developments are replicating high-rise models which failed worldwide; there is limited intervention in the existing informal areas, many being in highly vulnerable locations where the level of risk is likely to increase with climate change; development has little regard for topography and ecological considerations; investment in accessible and good quality public space is restricted to some areas; the quality of the public realm does not always support health and wellbeing of the ageing population.

The proposed institutional links collaboration will identify means to make Medellín a more socially equitable and environmentally sustainable city, through two interlinked components:

1. A research programme focusing on developing expertise in: (a) local heritage and culture; (b) public realm, green infrastructure and wellbeing; (c) housing; and (d) mobility and socio-economic integration.

2. A knowledge exchange and training programme open to Colombian practitioners, policy makers and students based on the themes above.

Related outputs:


An interdisciplinary knowledge exchange programme aimed at sharing experiences and gaining further understanding around how places can build resilience and recover from disasters.

Approaches to dealing with these weaknesses should be rooted in seeking avenues for empowering governments and communities, breaking disciplinary boundaries and create innovative partnerships. This proposal emerged from the initial response and recovery from the 2017 earthquake specifically related to education experienced by TEC Monterrey, which in 2012, re-defined the institution’s strategy for education. This is rooted in a model able to integrate emerging world-wide challenges, such as economic instability, international competitiveness, global inequalities as well as emerging environmental and health challenges. Educativo TEC21 is based on an integral, interdisciplinary approach to education aimed to develop leadership skills, to enable capacity to confront forthcoming challenges and opportunities.

The learning path does not only include competencies related with the specific disciplinary backgrounds, but also includes the development of ‘transversal’ skills throughout the learning process (TEC21, 2016). At the same time, IPT, Universidad Iberoamericana Puebla and UNAM have developed knowledge and expertise in relation to disaster recovery, that ranges from the analysis of geodynamic movement to community engagement and networks that emerge as a response to the emergency.

The the proposed activity has the objective of providing an opportunity for addressing emerging global challenges in relation to resilience and disaster recovery through sharing experiences.

This knowledge exchange is expected to provide the framework to formulate clear research questions and lines of investigation reflecting the expertise and interests of all participants. This will enable the development of a multi-disciplinary global research network which should continue creating knowledge, capacity and evidence to recover from disasters.

As a result of this activity we have the following expectations:

- The development of an interdisciplinary research group aimed to continue collaboration for research and capacity building,
- The identification of potential research agendas, including questions and programmes which could be made available to the related postgraduate student community as well as staff with an interest on this area, and should be the starting point for the above long-term collaboration,
- The identification of potential drivers as well as challenges in the development of a long term collaborative teaching or research programme. This may include academic, financial and administrative issues.

Both the Centre for Contemporary Latin American Studies and the Office of the Americas within the University of Edinburgh are committed to supporting and promoting this activity.
DEVELOPING INTERDISCIPLINARY STRATEGIES FOR BUILDING RESILIENCE IN VULNERABLE AND FRAGILE COMMUNITIES IN LATIN AMERICA

A fellowships programme aimed at developing interdisciplinary research and partnership with two key institutions in Latin America (UNAL and UNAM), focused on understanding the relationship and interlinks between hazards and risk, conflict and informality.

This is a small scale fellowships programme integrating academic colleagues from Mexico (Universidad Nacional Autónoma de México, UNAM) and Colombia (Universidad Nacional de Colombia, UNAL). The programme furthers collaboration with existing partners in both countries, building on shared research agendas and maximising opportunities for future research collaboration.

The fellowships will offer pathways to continue and develop collaboration with these institutions, not only through providing a platform for undertaking research in the identified areas, but also providing an ambassadorial role between the universities in key disciplines.

A key longer-term aim is to further develop this network to address major issues of importance across Latin America, acting as an exemplar of what can be achieved by collaborations between outstanding universities across continents. The focus of the programme is on three, interdisciplinary and interconnected research themes, as initial knowledge clusters for future research:

**Hazards:** a key challenge identified was the exposure to environmental hazards, a topic on which UoE leads substantial interdisciplinary research. GeoHazards, a research group based in the UoE School of Geoscience but with cross-disciplinary activities across the institution, is learning from a range of hazards across the world and is facilitating community engagement.

Although some research has been undertaken in Colombia by Edinburgh academics, less so far has been undertaken in Mexico. The collaboration will enable a deeper understanding of challenges facing the region, opening new research horizons for UoE leaders and research students.

**Conflict:** a key area for mutual research with a focus on understanding crises, displacement, peace-building and global health, with a particular view into conflict and violence. UoE has undertaken world-leading research on peace agreements and has a number of GCRF awards relating to conflict and violence. Ongoing research in Edinburgh aimed at empowering communities, developing tools for building resilience and work in partnership with local and national governments, has been the result of initial collaboration with UNAL in Colombia and is expected to contribute to addressing similar challenges emerging in Mexico.

Collaborating with UNAM and UNAL will greatly extend the opportunities for developing Edinburgh’s research in this important area. An example of recent ongoing collaboration is the GCRF funded project led by our Law School around drug war-torn communities on the Mexican-US border.

**Informality:** considering the role of unofficial influences and actions on a population, including vulnerable communities, informal economies, informal settlements infrastructures and governance. Ongoing research in Edinburgh aimed at empowering communities, developing tools for building resilience and work in partnership with local and national governments, has been the result of initial collaboration with UNAL in Colombia and is expected to contribute to addressing similar challenges emerging in Mexico.

It underpins aspects of the research to be undertaken in the other themes. This innovative approach offers an exciting and novel opportunity for us to build shared, coherent research capacity in an entirely new interdisciplinary area.

We expect that all research undertaken by the fellows will contribute to furthering engagement with wider Mexican and Colombian contexts, shaping future research by local and regional priorities and generating impact with local communities, NGOs, policy makers and business as appropriate.
Order and Disorder is a joint-author research and publication project which will result in a significant monograph (80,000 words) to be published in 2019 by Routledge.

This book critically reviews the development of the concept of spatial order in modern urban form from the European Enlightenment, how this has been translated into precepts of urban design, how in turn these have been translated to very different political, economic, social and cultural contexts and how these are now significantly challenged in the emerging cities of today.

It argues that social order has more fundamental importance than ordered urban form in creating places in cities, and that urban designers, planners, architects and engineers and other built environment professionals need to base their approach to the moulding of urban space and new urban forms into urban places on deeper inter-disciplinary understanding of underlying social order.

The Enlightenment was the basis for a new attitude to the production of the built environment, stressing the role of the individual in design/planning, within the social control of professional and stylistic peer-groups. From this historical point perceptions of the relationship between space and society became increasingly institutionalised, albeit the actual development of space has continued to elude this conceptual ordering. This is no more obvious than in the rapidly urbanising Global South, where contemporary perceptions of space and form emphasise disorder, although what produces urban space and form is collective social order beyond the above institutionalisation processes.

Despite this, perceptions of city space worldwide continue to be focused on attempts at institutional ordering based on concepts of ordered form.

The book argues that these attempts to institutionally order space and form are actually negative in most rapidly urbanising contexts despite their overlay of social betterment, and are often the basis for political and economic exploitation.

A different approach to emerging urban space and form therefore needs to start from an understanding of the cultural imaginaries and social constructs that underpin the production of most city fabric and engage with these concepts and organisational forms to improve urban life for the majority.

This project explores the scope for, and acceptability of, landslide risk-reducing strategies for informal settlements from the community and state perspectives; to understand the barriers to landslide risk-reducing strategies; and identify politically and practically viable approaches to landslide risk-reducing strategies within a wider and more complex context of social and physical risk. It does so in the city of Medellín, Colombia, which has received many accolades for its urban planning and design which has received many accolades for its urban planning and design and has become a ‘model’ for cities elsewhere. Despite the city’s successes, informal settlement growth on land at risk of landslides continues to be a major problem due to its topography.

Lessons learnt about landslide risk management in this city have the potential to be easily disseminated across the developing world.

The project will provide:

1. A functioning pilot community-managed landslide risk mitigation monitoring scheme, which will serve as a model to be replicated elsewhere after improvements based on the evaluation;
2. Pilot individual house risk-mitigating improvements as exemplars in the (informal) community;
3. Raised understanding and awareness of perceptions of risk and techniques and strategies that can mitigate landslide risk in informal settlements through collaborative action;
4. Identification of key questions around the interaction between technical, social, cultural and organisational knowledges to address in further research on landslide risk mitigation.
CO-PRODUCTION OF LANDSLIDE RISK MANAGEMENT STRATEGIES THROUGH DEVELOPMENT OF COMMUNITY-BASED INFRASTRUCTURE IN LATIN AMERICAN CITIES

Testing the upscaling and international transfer of co-produced landslide risk-mitigation socio-technical arrangements.

Building on the previous ‘Resilience or Resistance’ research, this project aims to substantially develop our understanding of the scope for co-produced landslide risk-mitigation socio-technical arrangements through upscaling and internationalising this experience and meeting the following objectives:

Objective 1: Test the roll-out of community-based landslide risk management to two further communities in Medellín’s low-income NW sector.

Objective 2: Test transnational transfer of community-based landslide risk management between Colombia and Brazil, including through implementation of participatory monitoring and mitigation of landslide risk in one informal settlement in São Paulo.

Objective 3: Draw lessons on community-based landslide risk management from the Colombian and Brazilian experiences transferable to other Global South cities.

For the third objective, an international discussion/dissemination event will be held in UK, with Colombian and Brazilian research teams and community representatives, to reflect on the findings gathered in previous meetings, and produce a set of recommendations for socio-technical arrangements for co-production of landslide risk-mitigation strategies.
ARE ‘SMART CITY’ APPROACHES APPROPRIATE TO THE CHALLENGES OF URBAN RESILIENCE AND LIVEABILITY? LESSONS FROM PILOT EXPERIENCES IN MEDELLÍN, COLOMBIA

Exploring the limits of ‘smart city’ initiatives from the perspective of poor and vulnerable communities and the scope for combined use of top-down and bottom-up data-generation and management, as a basis for joint decision-making in urban management.

This project addresses the following challenges: (1) to assess the wider technological and societal impacts of smart city initiatives, including assessment of the effectiveness of adopted technologies as well as inequalities and social inclusion/participation; and (2) to redefine smart city approaches in a way that responds to the needs of the population, improving urban resilience and liveability.

Addressing challenge 1 requires an evaluation of the purposes and impacts of smart city initiatives in relation to poor, peripheral and vulnerable communities. This proposal contends that addressing challenge 2 requires enabling and supporting community-led data collection and management on the one hand, and the development of processes whereby top-down and bottom-up data generation and management can be used in complementary ways and provide a basis for joint decision-making on the other hand.

Essentially, the method consists of comparing top-down and large scale application of technology and data use with community-centric and -led initiatives to improve sustainability and liveability in cities. Community, third sector and local government stakeholders in Medellín and other cities will be involved in specific stages of this comparison, in order to maximise impact. Key methods being used are:

• Desktop review of literature on smart city and community-based approaches to urban management.
• Fieldwork, data collection and interviews with relevant government agencies, community organisations and NGOs in Medellín.
• International workshop in Medellín (May 2019) involving local stakeholders in Medellín and representatives from local government, communities and smart urbanism technology & services providers from other relevant locations analysed in the literature review, including site visits to locations related to Medellín’s smart city initiative and to the low-income neighbourhoods where the current HWU-led research on community-based approaches is being undertaken.

Exploring the potential for successful place-making in Scotland’s major waterfront regeneration projects.

The 2008 financial crisis and the subsequent recession have had a great impact on the economic development of Scotland, as well as of other parts of the UK and Europe, causing a dramatic slow-down in urban regeneration and urban development activities. Urban policy-making during this period has not stalled however, with new strategies, policies and guidance being formulated at both national level (e.g. the Scottish Planning Policy; National Planning Framework 3, etc.) and local level (e.g. City of Edinburgh Council’s Proposed Local Development Plan and the Edinburgh Design Guidance). With the expected upturn in the economy there is a need to understand how these policy and guidance frameworks can be best implemented to unlock the social, economic and environmental potential of urban regeneration in Scotland.

With the current major waterfront regeneration projects across the three Central Belt cities of Glasgow, Dundee and Edinburgh accounting for a large proportion of overall urban regeneration in Scotland, these provide a key opportunity to test the aspirations and strategies proposed in policy and guidance against the practical drivers and barriers of institutional arrangements and socio-economic conditions. Lessons can be drawn from past experience in waterfront regeneration in Scotland, as well as internationally. In addition, such lessons may be applicable to new and future waterfront regeneration initiatives elsewhere in Scotland, including in less urbanised areas such as in the Highlands and Islands.

This project builds on earlier action-research on waterfront regeneration around the North Sea funded by the European Regional Development Fund Interreg IIB North Sea Programme 2003–2007, http://archive.northsearegion.eu/iib/projectpresentation/details/&tid=19&theme=6 Related outputs:


History and Heritage

CHAPTER 05

HISTORIC DIGITAL SURVEY

Enhancing performance and objectivity of historic building surveying using modern reality capture technology, machine learning and BIM.

This ongoing project is developing new solutions to enhance the performance (time) and robustness of defect detection, classification and recording when surveying a historic building. Focus to date has been stone masonry. The project particularly investigates laser scanning and photogrammetry as modern reality capture technology, innovative algorithms for stone segmentation, machine learning as a robust and objective way to classify defect, and integration with BIM technologies and processes.

Related outputs:

BUILDING GREATER BRITAIN: ARCHITECTURE, IMPERIALISM, AND THE ENGLISH BAROQUE REVIVAL, C.1885–1920

Focusing on late Victorian and Edwardian civic architecture, this project re-evaluates the relationship between architecture, imperialism, and national identity in Britain and the wider British world (i.e., ‘Greater Britain’) through an examination of the English Baroque Revival in architectural design.

Often referred to as ‘Edwardian Baroque’, this important if obscure phase in the history of British architecture was part of the neo-classical resurgence in public architecture that occurred during the late nineteenth and early twentieth centuries, but which to date has received little scholarly attention. Emerging from and thus symbolising the renewed engagement with empire following Benjamin Disraeli’s ‘new imperial’ politics of the 1870s, the Edwardian Baroque can be understood as a prominent material culture expression of this particular episode in the political and cultural history of Britain. By situating this architecture in its proper cultural context, one of the principal aims of the study will be to connect it to broader currents in British history, politics, and empire.

EUROPEAN WRITING ON THE ART OF THE UNITED STATES 1945–1990

The focus of the book is the reception of US visual art in the writings of non-Anglophone art historians, artists and critics in Europe between 1945–90.

This timespan opens up exciting opportunities to re-think and explore the ideological, social, economic, aesthetic, and didactic positions on which European responses to American art were grounded. The starting point of 1945 marks the division between what has been called ‘Historical American Art’ and ‘Contemporary American Art’ (see Barbara Groseclose and Jochen Wierich, eds., Internationalizing the History of Art, 2009). As the latter was more internationalist in outlook, it naturally stimulated a more vigorous response across the globe in non-English-speaking cultures. Americans themselves not only defined the moment when American art became synonymous with contemporary art but also exported it through the idea that American painting had ‘triumphed’ on a world stage (Irving Sandler, Triumph of American Painting: A History of Abstract Expressionism, 1970).

While the notion of ‘triumph’ is controversial, the consensus is that the American postwar movements – abstract painting (abstract expressionism, post-painterly abstraction, hard-edge abstraction, colour-field painting, etc.), pop art, minimalism, conceptual art, land art, body/performance art; followed in the 1980s by postmodern tendencies such as appropriation art and abject art – experienced an unprecedented international success. The anthology’s end date of 1990 marks Perestroika in the Soviet Union, the fall of the Berlin Wall in 1989, and the unravelling of the Cold War.

Related publications:
Publication is scheduled for February 2019, to coincide with the annual conference of the US College Art Association.

BY: Alex Bremer
University of Edinburgh
WITH: British Museum
FUNDING: £130,000
Leverhulme Trust, Major Research Fellowship
YEAR: 2015–2019

BY: Iain Boyd Whyte
University of Edinburgh
WITH: Claudia Hopkins
Silvia Bottinelli
Igor Dukhan
Serge Guillaud
Filip Lipiński
Miguel Ángel Hernández Navarro
Veerle Thielamans
Ivo van der Graaff
FUNDING: $13,500 & $141,515
Terra Foundation
YEAR: 2015–2019

BY: Alex Bremner
University of Edinburgh
WITH: British Museum
FUNDING: £140,000
Leverhulme Trust, Major Research Fellowship
YEAR: 2018–2021

BY: Iain Boyd Whyte
University of Edinburgh
WITH: Claudia Hopkins
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Related publications:
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‘Loudoun’: A Documentary Film

‘Loudoun’ explores landscape design and architecture in Scotland c.1700. It uses various film techniques – animation, aerial photography, dramatisation, still photography – to communicate inaccessible fragile archives and complex history with greater immediacy to non-expert audiences.

The film addresses the question: is it possible to communicate the complexity of the scholarly historical discipline through the film without compromising its intrinsic value? Additionally it shows inaccessible fragile drawings to a wider public and utilises the disciplines of music, costume design, art history and interiors to set it in context. Over 90% of the film uses primary sources for its thematic and physical content. There is no voice-over or presenter distancing the viewer from the story.

Based on a true story, two boys – Lord Mar and Lord Loudoun, aged 11 and 15, at Loudoun Castle in 1690 – grieve the death of their parents. Both inherit aristocratic titles but they struggle to meet social expectations.

How can they commemorate their lost parents and do their duty? They read 17th-century metaphysical and Latin texts, play games of cards and dice – sadness and hope inspire them to design a garden commemorating their dead parents? Later, Mar became the principal designer of this formal garden commemorating their dead parents? Later, Mar became the principal designer of this formal landscape style in Scotland.

Mass Housing, Modern Architecture and State Power: A Global History

Mass Housing will provide a comprehensive global history of the interaction of modern architecture and state power round the cause of ‘homes for the people’.

Mass Housing is a single-author research and publication project which will result in a major (500 pages+) monograph to be published in 2020 by Bloomsbury Academic Press. Its focal subject is the vast drive after 1945 to provide “homes for the people”, which was one of the world’s most ubiquitous modern architectural programmes, and a central legitimizing pillar of nation-states worldwide; yet it also reflected the strong transnational cultural theme of egalitarian Modernist transformation.

Recently, in most European and Western countries, this national/international legacy has undergone waves of disillusionment and attempted revitalization. But its sheer scale and controversial character have seemed too overwhelming to allow any effective global historical overview. There is growing interest in the story of mass housing, but historical accounts are so far restricted to a national/regional/local level.

The book firmly integrates the architectural and city-planning practices of Modernism with the key contextual factors shaping housing production, such as socio-political ideology, socio-economic influences and building construction/organisation. This, in turn, will allow exploration of broader meta-narratives, such as the relationship of architecture as a whole to state-building and cultural/political ideology. This represents a ‘globalised’ expansion of the chronological/geographical/thematic formula of my 1994 book on UK housing (with Stefan Muthesius), Tower Block. Compiling this story involves literature-surveys and extensive fieldwork in all continents of the world.

This book will, for the first time, tie these fragmented sub-themes into an authoritative narrative of the global movement of Modernist mass-housing production, from its European roots around 1900 to its recent dramatic resurgence in Eastern Asia, acknowledging both its linking themes and its diversity. It traces a century of furious campaigning, focusing on intense high-production “hotspots” in the post-1945 years, but contextualising these with backdrop phases. Its overarching theme is the interaction of Modernist ideology and expansive state power in the ‘housing-drives’ of the ‘long 20th century’. Reflecting mass housing’s regional diversity, the book’s overarching narrative incorporates a geographically-arranged secondary structure. Framed by chronological introductory and concluding sections (Parts I, III), the central section (Part II), covering the focal 1945–1989 era, outlines the world’s key mass-housing ‘campaigns’, spanning all continents and all major countries.

Related outputs:


Tower Block: www.fields.eca.ac.uk/gis/TowerBlock.pdf
PUBLIC HOUSING IN HONG KONG: AN ARCHITECTURAL AND POLICY HISTORY

A History of Public Housing in Hong Kong will provide an in-depth history of the political, organisational and architectural aspects of the world’s most daring public housing programme.

How did this astonishingly bold building campaign come about – so different from anything before it in the century-long global saga of public housing? While some existing books deal with fragments of this subject, this is the first to address it in its entirety. This is a subject of high intrinsic historical interest: one of the most dramatic episodes in the history of the building of the modern, post-1945 world, and one which, remarkably, still continues today. Here, the book establishes what was built and why, based on methodical historical explanation of archive sources and recollections of key participants as well as field-based inventorisation of the built pattern. And it contextualises the programme within the wider global narratives of mass housing and of late British colonialism, especially through comparisons with the parallel housing drive in decolonising Singapore.

In the process, the book counterbalances the portrayal, in most Western countries, of public housing’s story as a pre-ordained ‘failure’.

SCOTCH BARONIAL: THE ARCHITECTURE OF SCOTTISH NATIONAL IDENTITY

Scotch Baronial (co-authored with Aonghus MacKechnie) will fill the longstanding gap between architectural and politico-cultural analyses of Scottish ‘national identity’ through a politically-framed examination of Scotland’s ‘castellated’ architecture, especially during the ‘unionist centuries’ from 1603 onwards.

During those years, Scottish nationalism was assertively maintained, in a form very different from today, focused on parity of esteem within Union and Empire – and the monumental forms of architecture played a central role within that discourse. Our book encompasses all the principal public architectural works of 16th–19th century secular ‘castellated’ Scottish architecture, from the palaces left behind by the ‘lost’ monarchy to the story’s climax – the proud Scotch Baronial’ country mansions and town halls of the Victorian age.

None of this has been done before. We begin with the wider context of early-modern European politics, moving on to address the growth of Romanticism and nationalism at an international level, explaining the pioneering architectural role played by ‘Imperial’ Scotland. We finish with the shock of World War I, and a new and paradoxical age in which an independence-orientated political Scottish nationalism emerged while the ‘Castle Age’ finally expired.
A major new study of British theatre architecture, 1945–85, which sheds significant light on the period’s architectural, social, and urban histories.

Between the 1950s and the 1980s, a wave of theatre-building led to the construction of often substantial new theatres across the length and breadth of England, Scotland, and Wales. The vast majority were – unlike pre-1939 theatres – supported by public subsidies, both in terms of their construction and operation. In this respect, the introduction of a system of public subsidy in the late 1940s had re-cast culture as an arm of the nascent Welfare State, in which access to the arts was understood as a basic right and a way to counterbalance the potential materialism of an increasingly affluent society.

Britain’s new theatres were shaped by a range of individuals and organisations, including local theatre companies whose newly subsidised status allowed them to improve their work and expand their horizons. Local authorities were often keen to promote theatre building as an expression of their ambitions and to stimulate civic pride: many theatres were included in larger ‘civic’ developments and comprehensive redevelopment schemes. Architects, meanwhile, embraced the possibilities of what Peter More – one of several designers who specialised in the type – dubbed the ultimate building for its balance of public and private functions, its symbolic potential, and its technical complexity.

This project has led to journal articles, magazine contributions, conference presentations, and a Knowledge Exchange project with The Theatres Trust. The principal output is a book of 120,000 words (Oxford University Press, 2018), which, by setting these buildings in a wider context, also sheds new light on the architectural and social histories of post-war Britain.

Related publications:
The National Health Service was a fundamental component of the post-war British Welfare State. It was implicated not only in the transformation of public health but also, in its architecture, the image of a modern country.

This piece of research examines the architectural consequences of the 1962 Hospital Plan, which called for a major programme of construction. Few hospitals had been built during the 1950s; after 1962, the pace substantially increased, prompting research and debate in all aspects of hospital design and construction. To date, however, architectural historians have not seriously engaged with these buildings. Few were designed by well-known architects; few were ever completed as intended.

The work has three objectives:

- To contextualise the 1962 Hospital Plan within a wider programme of state-led technocratic modernisation
- To examine the hospital architecture of the 1960s and 1970s, exploring how developments in Britain were informed by such work as the 1955 Nuffield study, practice abroad, and developments in other spheres.
- To identify key examples of the period and to understand how national policy and debate shaped local practice.

Outputs:
A major new study of naturalism in European and Latin American architecture, 1400–1800, which sheds light on how architecture was used to define both nature and representation at the beginning of the modern era.

Since the nineteenth century, architecture has been defined by what it is not—as a field whose imitative functions little resemble those of so-called “figural” arts like painting and sculpture. And yet few would deny that architecture joins the figural arts in imitating other entities, especially natural forms. Nature and Imitation in Early Modern Architecture will excavate the history of this paradox.

Throughout the ancient and medieval periods, European architects variously promoted and transgressed the classical dictum that art—and, by extension, architecture—should imitate nature. However, it was first with the circulation of Vitruvian literature during the fifteenth century that the continent developed a coherent discourse on architectural figuration.

Research on the imitation of nature in early modern architecture has mainly addressed the emulation of the human body and plant life, as well as Urarchitektur such as Adam’s house in paradise. With a few key exceptions, most scholars have regarded these as parallel forms of architectural imitation, focusing on the natural objects represented rather than the ways in which the task of architectural figuration was variously conceived at distinct historical junctures and across different cultural contexts.

Nevertheless, early modern thinkers increasingly distinguished among building that imitates raw nature, architectural embodiments of manipulated nature, and architectural representations of structures comprised of naturalistic forms. Meditations on architectural naturalism in both text and building likewise engaged a complex rhetoric of artifice and artificiality.

Until we grasp how architecture variously embodied nature from the Renaissance to the Enlightenment, we cannot understand the origins of modern ideas about architectural figuration, representation, or meaning, nor architecture’s present relationship to the figural arts.

The history of architectural naturalism can only be recovered through a diachronic and geographically broad array of case studies. Nature and Imitation in Early Modern Architecture will therefore chart changing strategies for figuring nature in the architectural culture of Europe and Latin America, from the birth of Vitruvianism to transcendent conversations about architectural naturalism to the Enlightenment and the onset of ambivalence about the emulation of nature as a model for building.

Analysing built structures and Kleinarchitektur as well as architectural treatises, drawings, and prints in Europe and the Viceroyalties of Peru and New Spain where those materials also circulated, the book will trace the rise and fall of the notion of a natural architecture.

The project will argue that the Enlightenment’s rejection of the imitation of nature as a goal of architecture precipitated the medium’s ultimate alienation from the figural arts and the modern notion of architecture as an autonomous language of representation. Nature and Imitation will thereby challenge the widespread assumption that architectural figuration has always differed from imitation in the figural arts.
We seek to broaden the way time is approached within design and to develop and experiment with design principles that enable the excavation of time as multiple, unequal and contested.

From critiques of acceleration, to efforts to frame present actions within more extended futures, designers have been increasingly concerned with how perceptions of time influence practices and how these perceptions can be influenced by design. In this project, we argue that perspectives of time in design are highly influenced by dominant narratives that describe time as uniform, external to practices, and in a state of continuous acceleration. We propose Temporal Design as a shift from pace, direction, and subjective experience towards looking at time as emerging out of relations between cultural, social, economic and political forces. We argue that this pluralist perspective helps to demystify problematic experiences, potentially enabling more inclusive ways of understanding time.

The project includes designed objects, critiques of dominant philosophical approaches to clocks, cataloguing art and design projects that challenge the standard clock, and a series of Temporal Design workshops.

Key outputs:
This research represents a new kind of critical investigation of the renowned Fun Palace as an emancipatory educational and civic cultural programme developed in London between 1961 and 1975.

Crafted through the interdisciplinary collaboration between the radical theatre entrepreneur Joan Littlewood, architect Cedric Price, cyberneticist Gordon Pask amongst others, it aimed to construct situations in which self-directed and playful exchange could activate audiences. By 1964 the Fun Palace had gained momentum, and a giant cybernetic infrastructure was depicted within the Civic Trust’s plans for Lea Valley. However, by the end of the decade, its social ambitions were conveyed in a series of community-led temporary and local playgrounds emergent in Stratford East. Constantly struggling for a site in the institutional map of London, the Fun Palace would be realised as a media event, through the different representations designed to promote the ambitious idea during the 1960s and 70s.

Related publications:

Drawing is central to architecture and allows us to discern/discover the essentials of design. This project examines the informal architecture of mobile street food vendors (in SE Asia) and celebrates the aesthetic and societal value of a myriad of nomadic stalls as the antithesis of the sanitized food court.

South East Asia, and Bangkok in particular, is justifiably renown for its vibrant street food, and books such as David Thompson’s epic Thai Street Food (2009) have catalogued individual recipes but the means by which street food is delivered seems to have been largely overlooked. This project focuses on the mobile architecture of the vendors’ trollies, carts and wagons. Each stall holder’s wagon is highly personalized and bespoke to the particular food/snack for sale. Each stall is a small-scale (temporary) intervention in the public realm which connects to a wider network.

Related output:
THE SKETCHBOOK AS A CULTURAL TECHNOLOGY

Studying the conditions of emergence of the sketchbook as a material object, a disciplinary tool, and an instrument of self-fashioning; its historical transformations; and its relation to changing technological, material and ideological networks.

Artists’ and architects’ sketchbooks have usually been considered in relation to particular bodies of work as evidence of specific experiences and artistic processes. This study moves away from what have to date primarily been biographical and evidential readings of the sketchbook in order to address it in its own right as a historical, physical, and even technological form. It is interested in questions of: the conditions of emergence of the sketchbook as a material object, a disciplinary tool, and an instrument of self-fashioning; its historical transformations; and its relation to changing technological, material and ideological networks (involving, for example, paper manufacture, drawing instrumentation, technologies of travel – but also aesthetic ideologies, concepts of self-edification, markers of cultural authority, etc.)

The research, which will develop through close analyses of selected sketchbooks held in the British Museum and other archives, takes a broad cultural-historical approach to its material informed by recent critical work on historical forms of media and representation.

The study is orientated by clusters of thematically interlinked questions – How do we define the sketchbook and is the definition stable across time? When does the sketchbook emerge and how does it transform? In what specific ways has it been mobilised in the construction of the cultural authority of artists and architects? How do the specific formal and material properties of the sketchbook animate and anticipate developments in representational technique? And how is its development shaped by the increasing historical separation and proliferation of specific disciplinary domains of inquiry?

DESIGNING THE DEEP FUTURE: CATASTROPHE, CONTAINMENT AND THE CULTURAL IMAGINATION

An archaeology of the ways in which late-modern technoscientific culture has addressed itself to – and has imagined projecting itself into – the deep future.

This book aims to develop an archaeology of the ways in which late-modern technoscientific culture has addressed itself to – and has imagined projecting itself into – the deep future.

Deep futures never sit within narratives of continuity with present conditions, but it is exactly this that makes them such peculiarly symptomatic sites for understanding the latter (how the present assembles or ‘designs’ itself for the future; what it selects for salvage; its criteria of inclusion or exclusion; its imagined ethical responsibilities toward those to come; etc.)

This is to say that the postcatastrophic deep future is where the present, any present, meets its limit conditions – where not only material endurance but also the possibility of any communication comes into question. We see this, for example, in contemporary dilemmas over the marking of radioactive waste sites, which will remain toxic for so long that even the species-condition of the future addressees of the signs is uncertain. In this way thinking about the deep future critically folds back into, and poses questions to, the constitutive limits of contemporary cultural practices and artifacts, even as they are assembled and organised to make claims upon – and even to colonise – that future.

The container, as the vessel through which the present conveys or transmits something to the future, is the characteristic technocultural artifact of this story and the book will build up through a series of case-studies that examine and expand upon specific, although interlinked, cultural histories of such projects of containment.

Related outputs:
ARCHITECTURAL LINEAMENTS: DRAWING AND NARRATIVE IN THE WORK OF PETER WILSON

A sustained scholarly consideration of the work of this important contemporary architect.

Emerging from the Architectural Association in the 1970s, Peter Wilson’s work has displayed a very particular and finely-tuned graphic sensibility, involving a heightened condition of architectural figuration. Yet despite his significance, the range of his production and his publications, there has been no sustained scholarly consideration of his work.

The project addresses this through a two-day symposium and related publication. The symposium was held at ESALA on 9 and 10 April 2018 and involved reflections upon Peter Wilson’s work by an international group of scholars and practitioners including Kurt Forster, Isabelle Doucet, Nigel Coates, Nicholas Boyarsky, Adrian Hawker, Michael Gold, Mark Dorrian, Izabela Wieczorek, and Elisabetta Terragni.

The event was held with the collaboration and support of the Drawing Matter Trust and included a lecture and open discussion with Peter Wilson himself. A special issue of the Journal of Architecture, based on the proceedings, is currently in preparation.

THE PLACE OF SILENCE: ARCHITECTURE / MEDIA / PHILOSOPHY

An exploration of the poetics and politics of silence in architecture and related media.

This edited collection – which incorporates contributions by internationally recognised scholars in architecture and the humanities, including Gernot Böhme, Paul Carter, and Alberto Pérez-Gómez – explores the poetics and politics of silence in architecture and related media through a series of thematically interlinked chapters. What counts as silence in specific situations is highly relative, and the term itself – which is often linked to some condition of cessation or interval – carries complex and varied significations that make it a revealing field of study. Thus while, on one hand, the often-remarked upon contemporary ‘loss of silence’ has been frequently linked to a disappearance of reflection or inwardsness, silence has also, on the other, been understood as a condition of intensified outwardsness – of heightened attention, anticipation, suspense or expanded listening.

At an extreme, silence is often the sign of a limit condition – the silence that falls at the point of exhaustion, catastrophe or technological breakdown – or else is taken to mark the traumatic limits of experience, as that which testifies to an event beyond any possibility of adequate expression or symbolization. And yet at the same time, silence inheres in the everyday, appearing as the very precondition of communication, as the gap or delay that acts as the support of speech, or the spacing that forms the condition of legibility of written text. Divided into four thematic sections – Mediating Silence, Material Silences, Practicing Silence, and Silence and the Senses – the chapters of the book unfold a rich and complementary array of perspectives on architecture and silence. Together, these build into a volume that will form the key scholarly resource on this topic.
A ‘contemporary history’ of recent British theatre architecture.

Despite austerity and sharp cuts in public expenditure, the last decade has seen something of a boom in building and creating space for theatre in Britain. Major new theatre buildings, such as Aylesbury’s Waterside Theatre and Doncaster’s CAST, have been accompanied by innovative projects such as Storyhouse, Chester, which transformed a redundant 1930s Odeon cinema into a library, theatre, and small cinema, cleverly mixing functions to well-received effect. Liverpool’s Everyman Theatre was reconstructed to popular and professional acclaim, winning the Stirling Prize in 2014. There has been significant investment in the existing stock of theatres, with older theatres being transformed: a particular focus has been the refurbishment and reworking of theatres built during the 1960s/70s boom, including Chichester Festival Theatre, Sheffield’s Crucible Theatre, and the National Theatre in London.

This project will lead to a book of c. 55,000 words for Lund Humphries, which examines theatre architecture in Britain during the last ten years. To be completed in late 2018, the book – essentially a ‘contemporary history’ – is structured as a series of case studies plus an extended introduction. Part of Lund Humphries’ ‘professional’ series, the book is intended for theatre design teams and clients as well as those with an interest in the subject. As a result, it aims to uncover and analyse the ‘processes’ by means of which theatre projects are delivered, and the pitfalls experienced along the way.

The project, a co-edited book, builds on the work of the Saturated Space research group at the Architectural Association, London. The proposed book will be an edited volume of essays bringing together a uniquely broad range of disciplines fusing art and science.

Colour as a metaphysical phenomenon, enlightens and invigorates, yet is frequently misunderstood or neglected as an instrument in the design of space. The book will present personal reflections from neuroesthetics, chemistry, earth science, mathematics, physics, chemical biology and nanoscience; specific works from practitioners in art and architecture and insights from commentators, theoreticians and critics in art and literature – each in their own field, a ‘saturated space practitioner’. Together they demonstrate a search for this unique and optically chiasmic space of saturation, one that is contingent to the practice of colour and architecture at urban, interior, object and molecular level. These observations will offer the reader a narrative journey of poetry and precision focused on the sublime experience of colour as a sensual spatial modifier. Saturated Space: Architecture of Colour represents an, as yet, unseen engagement with a world of numerous thresholds in which colour and architecture interact.

Relevant outputs:
www.saturatedspace.org
www.issuu.com/saturatedspace
Saturated Space Symposium
London, November 2016
www.youtube.com/watch?v=BjCN5z5SN94t=938s
STANDARD SIDE EFFECTS: THE ACCIDENTAL ARCHITECTURES OF FIRE-SAFETY REGULATION

Drawing-out the unintended consequences of building standardisation.

This PhD explores the messy interaction of political and architectural questions within processes of building standardisation. It studies the governmental intent of such processes; the problems they respond to, the rationales they employ, their particular ways of seeing, and the roles and responsibilities they define. It also studies the practical effects, and the unintended side-effects, of such processes; the ways in which those caught up in legislative frameworks are directed to their own purposes.

The research employs concepts and methods drawn from Infrastructure Studies. It understands such codes, standards and regulations as both discursive and material formations; processes through which governmental ways of thinking are constituted and mediated through practical application.

The methodology followed is one of an ‘Infrastructural Inversion’: the research aims to uncover the assumptions and sidings embedded within our built environment by focussing on its embedded standards and codes, making them visible through both historical and by-design analysis. The research topic is framed through a focus on fire-safety regulation, and operates through comparative case-studies. These studies analyse a number of cities; Edinburgh, Lagos, Tokyo and London. In each case, they study the formative effect of a single specific regulatory requirement; travel distance, set-back, fire-walls, egress time.

Looking for discrepancies between the stated intention of the regulations and their consequences on the ground, the thesis argues that as mode of ‘reflexive modernization’, the collateral consequences of regulatory processes are in fact central to their governmental effect. On this basis it suggests architects realise the capacity for building design to engage with and re-shape governmentality.

Related outputs:

UGLY, USELESS, UNSTABLE: NEW MATERIALISMS AND PROJECTIVE PROCESSES IN ARCHITECTURE

A monograph presenting three different takes on the contemporary discourses of New Materialism, deployed through the perspective of architectural design and aimed at an architectural readership.

Ugly, Useless, Unstable is a monograph presenting a series of contemporary takes on Neo-Materialist thought, deployed through an architectural design perspective and aimed at an architectural audience. This book traces relevant strands of 20th century post-structuralism and its gradual evolution towards 21st century neo-materialist ontologies, investigating their potential to challenge the classical canonical framework for both the description and the production of the built environment. The starting theoretical argument develops a reassessment of the classical apparatus, exposing it as a contingent value structure that has been inherited from comprehensive conceptualisation efforts carried out throughout the Western Enlightenment. This value structure is confronted with a non-binary framework of development and evaluation, which destabilises the axiomatic character of the classical by repositioning it as an occasional occurrence within an extended landscape of potential productive processes. This framework is developed throughout the three main chapters of the monograph, tapping into a theoretical lineage that conjures the work of Henri Bergson, Gilles Deleuze, Bernard Cache and Manuel de Landa (among others) through the notion of possibility spaces. Each chapter endeavours to tackle one classical trope – Beauty, Utility and Stability – and dissolve it into a broader continuum of heterogeneous production, ultimately articulating how this non-hierarchical space of potentials can be mobilized as a methodological approach to both design and judgement in architecture.

Related publications:

Work exhibited at the 16th Venice Biennale, Spanish Pavilion (May–Nov 2018).

Website: www.miguelparedes.org
A new cross-European research network on the study of the collaborative economy.

The main objective of this action is to develop a European network of actors (including scholars, practitioners, communities and policy makers) focusing on the development of collaborative economy models and platforms and on social and technological implications of the collaborative economy through a practice-focused approach.

The specific aims of the proposal are:

(i) To develop a deeper understanding of the collaborative economy phenomenon in all its aspects, by studying in-depth the sociotechnical systems and human practices involved, comparing and reflecting upon local, regional, national and international initiatives;

(ii) To discuss and critique elements of the current discourse on the collaborative economy, and proposing a richer definition and characterisation of the phenomenon;

(iii) To formulate a European research agenda for the sociotechnical aspects of the collaborative economy, including specifically the design of future technological platforms, the technical infrastructure, their legal, ethical and financial implications;

(iv) To articulate a European research perspective on the collaborative economy, based on EU values of social innovation, and in line with the Europe 2020 strategy objective to become a smart, sustainable and inclusive economy by 2020.

The Action will produce online resources including publications offering a comprehensive view of the current European collaborative economy and socio-technical and policy recommendations for the future.

Related publications:


Website:

http://sharingandcaring.eu/

Contributors use visual texts including drawings, diagrams, paintings, visual devices, photography, film and hybrid forms of visualisations through which to research architecture, landscape design and interior architecture. The visual methods intersect those used in ethnography, anthropology, visual culture and media studies. This book offers a distinctive approach to the use of visual methodologies for qualitative architectural research. It presents a diverse, but not comprehensive, selection of ways for the architect or architectural researcher to use their gaze as part of their research practice for the purpose of visual literacy. Its contributors explore and use, what we term, ‘Critical Visualisations’ which employ observation and socio-cultural critique through the creation of visual texts, drawings, diagrams, paintings, visual devices, photography, film and their hybrid forms. The book positions these in relation to visual methods practiced in ethnography, anthropology, visual culture and media studies. The emergence of studies in visual culture has changed the research methodologies practiced by many humanities disciplines, and we expose critical positions on these (Krauss in Art History, Pink in Ethnography, and Rose in Cultural Geography etc.), and reflect on how architecture might use ‘visuality’ as a research method so as to increase the architectural researcher’s visual literacy. It aims to present a range of inter-disciplinary approaches which open up territory for new forms of visual architectural scholarship.

The visual is understood as always involving our embodied experience. The experience of architecture is a multi-sensorial one requiring that the visual is open up territory for new forms of visual architectural scholarship. There is a need to define sensory research methods for architectural scholarship so as to redefine the visual, vision, and ways of looking at and seeing architectural research.

The research for this book has been developed from a symposium chaired by Troiani and Ewing at the All Ireland Research Group (Dublin, 2014), presentation at the AHRA Postgraduate symposium (Sheffield, 2016) and is also informed by their ongoing collaborative work on publication of interdisciplinary research and criticism as co-editors of peer-reviewed journal, Architecture and Culture.
‘Voices of Experience’ is a collaborative project which choreographs site-based conversations between architects at different stages of their career.

The project formed part of the Glasgow Women’s Library’s 25th Autumn and Spring Programme (2016–17) and is developing an oral and material archive in partnership with GWL, Architecture Fringe 2017, Collective Architecture, ESALA and Panel. The project asks how role models and built environment histories might be re-thought and accessed in new ways through listening to experienced architects, planners, designers, engineers who have not been written into professional myths, mainstream history and public consciousness.

Motivated by the lack of experiential (hi)stories of architectural practice and projects, and with ambition to steward new practice-based disciplinary stories, the project constructs a series of conversations between a highly experienced architect and an architect at the outset of their career who have a project site or thematic concern in common.

The contextual focus is late twentieth century Scotland, at a time when building Scotland again offers a foregrounded clarity to the social and public purpose of architecture (Building Scotland, Alan Reiach and Robert Hurad, 1958; Rebuilding Scotland, The Postwar vision 1945-1975, Miles Glendinning, 1997). Contributors to the project have included architect Margaret Richards (formerly of RMJM), conservation architect Fiona Sinclair, architect/historian Dorothy Bell, teacher/architect Anne Duff, architect/planner Kirsteen Borland, architect Denise Bennett and conservation architect, Jocelyn Cunliffe. They have been joined by Mairi Laverty, architect, Jocelyn Cunliffe. They have been joined by Mairi Laverty, Daniela Geri of Glasgow City Council, Melanie Hay, conservation architect and Grace Marks, coordinator of RADIAL project.

Over a series of autumn and summer site-days, they discussed their work and shared their experience of working within Cumbernauld New Town, the Clyde Valley, Glasgow Necropolis, Linlithgow, and Edinburgh’s historic centre and University quarter. Insights include how architects discover their preoccupations, strengths, range and niche through different working relationships and formats; resonating experiences of women entering into architectural education decades apart; and the making and remaking of homes and work at different stages of life and outlook.

ECOSOPHIC URBANISM AND “OCEANS OF WETNESS”

Using the vehicles of design studios, seminars, workshops, exhibitions and publications, this ongoing research has been exploring different ways of drawing the urban landscape, most recently, from the perspective of water.

“Ocean of Wetness, is a transdisciplinary platform, a critical design practice, and a pedagogical initiative that asks if we have been so consumed by the vocabulary of land and water that (a) we miss or fail to understand peoples who devise other ways to inhabit ubiquitous wetness; (b) we deny the possibilities of a new imagination capable of solving today’s problems without perpetuating the ground that created them.”

Dilip da Cunha


Recent research-by-design experiments have been undertaken in India (Bombay and Calcutta) and Scotland (Selkirk). They open up different understandings of important existing urban/landscape contexts and have four main objectives:

1. To visualise these contexts in ways that conventional models of urban planning tend to obscure;
2. To supplement existing urban planning methods with new visual agencies;
3. To bring ecological and human relations into systems of urban analysis and design, and;
4. To speculate in existing conditions to frame new possible infrastructures between ecologies.

Related outputs:
Drawing On is a peer-reviewed International e-journal. It provides a platform for developing topics associated with or addressed through design-led research into architecture.

The ambition of the journal is to promote a closer, more direct engagement between the author, their research material and the reader, all of whom play a role in creating an interestingly rich plentitude in architectural thinking and imagining. The simple premise guiding Drawing On is that design-led research involves, and indeed relies upon, multiple modes and means to fully elaborate its thinking.

Drawing On thus presents multiple media, for example, including text, images and notes, video, audio, animation, photography, paintings, drawings, documentation of models, and designed texts. The reading of the work involves reading across these multiple modes, and allows for various formats to take the lead in communicating the means, outputs and methods of design-led research.

To this end the journal adds to the conventional format of a peer-reviewed journal, an additional space of presentation intended to show design-research material in different lights.

Drawing On is a biennial publication. Each issue draws on a specific subject, situation, theme or idea. This may include issues linked to particular events, exhibitions or conferences. Currently there is a pool of no less than 21 International Scholars acting as reviewers. This will grow. Thus far, two issues have been published: Drawing On Presents and Drawing On Surface and Installation. A third call will be issued soon. However, a major new collaboration with the Australian schools of Architecture has also just been agreed. Drawing On will publish select papers from a significant Architectural Design Research International Conference to be held in the University of Sydney in September 2018, which will attempt to pool the Research-By-Design currently being undertaken in the Australasian continent. This issue will be published prior to their second ADR conference scheduled for Monash University, Australia, in 2019.

Related outputs:
Knowledge by Other Means is an epistemological exploration of data-driven drawing processes as carried out by a custom-built robotic apparatus, identifying non-computable elements of thought in the development of spatialized digital intelligence.

Half a decade past the consolidation of the first ‘Digital Turn’ in architecture, contemporary designers seem to have decidedly embraced the unprecedented power of machinic thinking, subsequently adopting its embedded logical processes. We may, however, pose a critical question in the context of this ‘second computational turn’: Are there any non-computable elements of thought in the development of spatialized digital intelligence?

In answering this question, the project unpacks a series of productive relationships intersecting drawing and the passing of time, operating at various scales and developed in the context of a data-driven design environment.

More specifically, this enquiry looks into the processes carried out by a custom-built robotic drawing machine, tracing dynamic vector data streams collated from a variety of spatial sources. This hybrid digital-analogue apparatus draws from a long historical lineage of vector-based machinic systems designed for architectural drafting. Situating themselves between the human hand and the surface of the paper, those machines acted as carriers of embodied spatial knowledge that could be selectively actualised into specific design processes and materialisations.

Deploying a range of intertwined digital and analogue media, this machinic environment is used to articulate a data-based drawing research practice and a subsequent ‘anexact’ drawing research methodology that further elaborates on the durational and multiplicitous aspects of the data-based drawings. This body of work is reflected on as a visual research methodology, which taps into Bernard Cache’s interest in architectural computation as a way to pursue philosophical knowledge ‘by other means’ and into Gilbert Simondon’s notion of the ‘technical ensemble’—emphasising the productive forms of indetermination emerging from its internal informational transfers.

Related publications:

Faraway and everyday landscape typologies shape human inhabitation, as well as cosmogonies, cosmologies, myths and folklore of different human cultures.

These spaces are sometimes the place of conquest, other times the place of retreat; sometimes regarded with fear, other times with fascination. The same landscape typologies can be the archetypical image of inhabitation, and the archetypical image of abandonment.

This project aims to unfold some of the meanings of landscape through the lenses of abandonment and inhabitation, shedding light over the pertinence of some concepts in particular historical periods, and the cause of their oblivion in others, for example, concepts of nature and environment; wilderness and sublime.

Both a teaching and a research project, it is being developed in the form of an elective course in the University of Edinburgh and simultaneously a book proposal.
With a focus on the geologic conditions of scale, frame, and ground in Manhattan, this research by design project unsettles issues and questions limits involved in the geo-representability of the island-city.

The dominant logics of the two-dimensional grid that extruded into what Manhattan is today have postulated a clear cut from the island’s own territorial past to generate a synthetic surface from which robust forms of capitalism, power, labour, real-estate, and retailing accumulate in vertical densities, and nature is but a reinvention of cultural phenomena. These logics conceal heterotopic geopolitical ground conditions of the island, frame events within and out with the grid’s geometries and orientations, and scale the city with the crystallised chaotic laboratory of the skyscraper mineralogy.

When contextualised in the emerging Anthropocene debate, which proposes an expansion of material and temporal frames and a collapse of human and earth geo-conditions, whilst problematising supposed divisions between nature and culture, Manhattan begins to reveal thicker complexities following other types of logic, which complicate and enmesh its own contemporary situation.

In this project, three influential architectural manifestos from the last three decades of the twentieth century – ‘Delirious New York’ (Rem Koolhaas, 1978), ‘Manhattan Transcripts’ (Bernard Tschumi, 1981), and ‘Lower Manhattan’ (Lebbeus Woods, 1998) – are analysed as means to develop a contextualization of Manhattan supported by an Anthropocenic thought and representational sensibility. From the analysis of these three archival sources as meaningful exercises of speculative fiction – they are narrated imagined realities – in relationship to geo-conditions of scale, frame and ground, the experimentation through text and design-led investigations gestures towards critical reflection on the agency of representation and on the ability to represent (or representability of) the geologic(s) of the island-city.

Related publications:


A key trans-disciplinary project in the emergent field of geohumanities, which looks at how the epistemic shifts implied by the Anthropocene debate may transform the way we think about representation and, more specifically, its geopolitics.

Originating as a hypothesis in earth sciences, the term ‘Anthropocene’ designates a new geological epoch in which humans are defined as a dominant geomorphic force, acting upon the Earth’s planetary system. Since its emergence, however, the Anthropocene has moved beyond being a concept limited to geology and has provoked an ever-expanding debate that traverses disciplinary boundaries. It unsettles conventional conceptions of the human, nonhuman and inhuman, and it problematises supposed divisions between nature and culture. It has come to underpin a strong narrative of human resource exploitation, planetary thresholds and environmental urgency and has gained prominence as a key concept for thinking about what the present means and the possibilities it holds for the future.

This collective project encourages explorations of the Anthropocene through the motif of postcards. We conceptualise postcards as documentary space-time snapshots, which convey complex assemblages of dynamic, non-linear, unpredictable, ad-hoc networks between interdependent and transcalar actors. The assembled postcards raise questions about the ethical and political challenges of the dominant modes of technoscientific knowledge production, modes that are constituted through existing power relationships, subject positions, and differences, and that perpetuate current inequalities. They aim to indicate new streams of speculative and creative geopolitical imaginaries and forms of collective subjectivity that recalibrate existing value systems and open up alternatives.

Drawing on the wide-ranging contributions to the recent international symposium and parallel exhibition ‘The Other Side’ (June 2017), an edited book is currently being prepared with curated submissions from important scholars and practitioners across multiple disciplines in the arts and humanities.

Related publications:

Website:
www.postcardsfromtheanthropocene.com
The original *Destitution in the UK* study, conducted in 2015, established the first firm evidence base on the scale, causes and experience of destitution in this country.

It had been hoped that the 2015 study would also be able to identify recent trends in destitution in the UK, but this was severely hampered by the lack of reliable time series data. A follow-up study now seeks to provide an up-to-date, deepened and more comprehensive account of the current position on destitution in the UK (see further below). Moreover, by documenting changes in those services included in both surveys, we hope to comment on trends, though it should be noted that our estimates will remain subject to significant margins of uncertainty.

**Related outputs:**

**Website:** https://www.jrf.org.uk/report/destitution-uk-2018
ERADICATING ‘CORE HOMELESSNESS’
IN EDINBURGH, GLASGOW AND
ABERDEEN: PROVIDING AN
EVIDENCE BASE

The overall aim of this research project is to provide an evidence base for the disbursement of an estimated £4million to relevant service provider organisations in Scotland’s four largest cities, to work towards the eradication of the most extreme forms of homelessness.

Related outputs:
HARD EDGES SCOTLAND: DEVELOPING A PROFILE OF SEVERE AND MULTIPLE DISADVANTAGE IN SCOTLAND

This project which follows the Hard Edges study in England and aims to produce a similar profile of severe and multiple disadvantage.

Based on secondary datasets, but with a somewhat wider definitional remit to encompass mental health and domestic violence issues. The project will also involve engagement with key actors on policy issues, focus groups and qualitative interviews with people with lived experience and service users.

Further work to prepare supplementary case studies has also been agreed funded through the Robertson Trust.

These case studies will provide an in-depth and holistic analysis of local systemic responses, taking account of service provider perspectives and service contexts, would significantly bolster the policy and practice-influencing agenda that is the ultimate purpose of the study. The 6 case studies will be illustrative of the range of relevant contexts found across Scotland, and will allow us to explore both contrasts and continuities in the challenges encountered, and changes required, across different sorts of places and communities.

They will be developed through key informant interviews, front line worker focus groups, interviews with service users and analysis of local statistics, policies and procedures.

FUNDING: £115,000
Lankelly Chase Foundation, with Robertson Trust
YEAR: 2016–2018

HOMELESSNESS PROJECTIONS

143,000 households were experiencing core homelessness in England in 2016, up 45% in 5 years. These numbers are likely to increase further in the future.

The project entails developing a new definition of ‘core’ and ‘wider homelessness’, measuring the scale of the components of these phenomena for England, Wales and Scotland, and developing a forecasting model to make conditions forecasts of future trajectories of homelessness across the UK, building on an earlier ‘policy modelling’ project undertaken with Joseph Rowntree Foundation.

Project is ongoing but has been presented at major national conference marking 50th anniversary of CRISIS, sharing platform with government ministers etc.

FUNDING: £40,000
Crisis
YEAR: 2017
The project is a follow-up to the ‘Hard Edges’ study conducted by I-SPHERE in 2012–2015. This follow-up study aims to further expand the evidence base. In particular, the current study will provide:

1. New evidence on a slightly different combination of disadvantages than in the original Hard Edges study;
2. Will provide insights as to whether services for SMD women should be configured in the same way or differently to services for SMD men.

Having more evidence in this area will be beneficial both for policy makers and managers of public and third-sector organisations delivering support to people with SMD, such as the NHS.

The landscape of food aid in the UK has changed dramatically in the last 10 years. Around 2008/09, food aid took almost exclusively the form of ‘soup kitchens’, catering for the homeless, people with ‘complex needs’ and immigrants with no recourse to public funds. Trussell Trust had only 17 foodbanks at that time. Currently, there are nearly 2,000 foodbanks of which 63% are Trussell Trust foodbanks. The Trust distributed nearly 1.2 million emergency food supplies in 2017/18.

This change in the profile of food aid organisations has been accompanied by an equally marked change in the profile of people in need of food aid: the majority of foodbank clients can be described as ‘housed, financially struggling, without complex needs’, as opposed to the ‘homeless/complex needs/migrant’ clientele of soup kitchens (Perry et al, 2014; CAS, 2016). In accordance with that, a recent study of people experiencing destitution in the UK has found that UK-born people without complex needs constitute the largest group within the destitute population (Fitzpatrick et al, 2015 and forthcoming).

The State of Hunger will be an authoritative, sector-leading UK-wide annual benchmark study to answer the question of what is driving hunger in the UK and who it affects. The study will provide Trussell Trust with the evidence base it needs to create policy recommendations to end hunger in the UK. Crucially, it will provide much-needed detailed evidence on specifically which policies and factors are primary drivers of hunger. Furthermore, it will provide evidence from different areas of the UK regarding ‘what works’ in alleviating hunger, in terms of policies and other practical solutions.
The Centre for Homelessness Impact will launch an evidence platform during 2018. To support this platform the Centre is supporting the production of two evidence and gap maps.

The first is a map of effectiveness studies, which is being produced by the Campbell Collaboration with some technical inputs from I-SPHERE (Heriot Watt University).

This project will be to develop a map of process evaluations (implementation reviews) of homelessness interventions.

Related outputs:
www.homelessnessimpact.org/gap-maps
QUALITATIVE PILOT EVALUATION OF PHARMACIST INPUT INTO CLINICAL CARE OF HOMELESS PEOPLE

Evaluation of dedicated (prescribing) pharmacist input into the healthcare of homeless people.

This qualitative study will assess homeless people’s perceptions and personal experiences of dedicated clinical (prescribing) pharmacist input into their clinical care. It will focus on the delivery of services to homeless people who are recruited to the service via specialist homelessness health centres, in hostels, and via street outreach. The study will also seek homeless people’s views regarding the outcomes that should be assessed and means of recruitment employed in a proposed Randomised Control Trial (RCT) which will measure the effectiveness of the approach at a larger scale.

The information gained will be used to improve user uptake and the effectiveness of the pharmacy service itself, as well as to maximise the proposed RCT’s relevance, recruitment and retention.

ENDING ROUGH SLEEPING — WHAT WORKS

The existing evidence base on the effectiveness of interventions with rough sleepers is piecemeal and scattered with key findings far from accessible to policy makers. For this reason Crisis commissioned this review of the existing international evidence base.

Related outputs:


RESILIENT BORDERS PROJECT

Using speculative design proposals in community consultations to propose sustainable infrastructures for our towns.

Resilient Borders is about empowering communities to propose and communicate ambitious development plans at the scale of the town. The project was based on the premise of putting together an ambitious plan for Galashiels in 2040 following the catalytic effect of the Borders Railway.

As a starting point, the project utilises work completed by postgraduate design students in a series of workshops that provoke and encourage communities to think about themselves in a spatial and infrastructural way. The project methodology helps stakeholders to understand their own settlements as networks of energy, resource and communication.

Community workshops asked participants to look at all the work, rate the projects to a series of sustainable metrics, and ultimately agree on a series of themes. Specifically, the second workshop embedded these themes in the town as a series of ambitious and far-reaching proposals. These were then refined as a vision of how that town can be 25 years in the future. In this we adapted techniques such as appreciative enquiry to provide a series of narrative that is then translated into an array of spatial infrastructures.

The project is important because it lifts expectations of what a sustainable town might be. Resilient Borders provides the means to a vision and ambitious blueprint for sustainable development.

It is designed to inform and influence existing planning and development processes for the town.

Outputs included a public exhibition of the work and the preparation of a project toolkit circulated throughout the Borders region [October 2016]. Further outputs in the form of peer reviewed articles are in preparation that chart how academic – educational – community partnerships can be sequenced in a way to maximise benefit to all parties.
Youth homelessness has historically been addressed via congregate hostel-type supported accommodation. This can hinder young people’s capacity to address their support needs, maintain healthy lifestyles, and/or develop independent living skills.

The high costs of these models are known to dis-incentivise engagement in paid work. In this context, there is strong sector support for developing a spectrum of ‘community hosting’ models for this group. Such models involve young people living with private host households, with support to the host and young person provided by a specialist organisation.

Existing services in this area in Scotland are limited: a small number of emergency ‘Nightstop’ schemes have recently been established and longer term ‘Supported Lodgings’ models are used in some areas for care leavers, but longer-term community hosting models targeting the broader youth homeless population do not currently exist.

This project aims to explore the potential opportunities and challenges associated with pursuing such an approach ‘at scale’ for young people experiencing or at risk of homelessness in Scotland. The study is particularly well timed giving pressures on public finances, temporary accommodation and other homelessness provision, and young people’s benefit entitlements, which combined with housing market pressures have made it increasingly difficult for many young people to access and maintain appropriate accommodation.

I-SPHERE researchers will work closely with Shelter Scotland to: review the international evidence base on ‘community hosting’ models; understand the success and challenges of existing Supported Lodging schemes in the UK; explore the feasibility of pursuing Supported Lodging schemes in Scotland, from a business and financial sustainability perspective and by investigating the attitudes and perspectives of potential ‘host households’ and young people in existing forms of homelessness accommodation to such models.

The project supports the development of a stream of early career researchers equipped to undertake high-quality, policy and practice-applied research on homelessness, via establishing and managing a bespoke Oak Foundation internship scheme.

It also provides expert advice and support on the research and evaluation elements of Oak’s homelessness and related projects, both to Foundation staff and directly to organisations holding grants from Oak.
Evaluation of an innovative peer mentor project assisting homeless people with multiple and complex needs.

Shelter Scotland’s ‘Time for Change’ project, based in Dundee, will establish and train a network of volunteer peer mentors with lived experience of multiple and complex needs. The peer mentors will assist homeless people experiencing severe and multiple disadvantage to access and maintain engagement with support services relevant to their needs.

They will aim to ensure that support is relevant, improve choice and control, and help those involved develop skills and resilience. Using qualitative methods, a team based at I-SPHERE will evaluate the impact of the project on both peer volunteers and those helped, in order to assess the effectiveness of this model as a mechanism for sustainable change within the homelessness sector.

Related outputs:

Evaluation of the effectiveness and ethicality of welfare conditionality.

The use of conditional welfare arrangements that combine elements of sanction and support is an established element within welfare, housing, criminal justice and immigration systems. This five year research project creates a collaborative, international and interdisciplinary focal point for social science research on welfare conditionality by exploring the efficacy and ethicality of conditionality across a range of social policy fields and diverse groups of welfare service users.

Heriot-Watt is leading on three of the total nine ‘strands’ of work, including assessments of the impacts of sanction and support on homeless people, lone parents, and social housing tenants.

Related outputs:
Developing Affordable Housing in Urban Environments for Older People

Designing affordable housing to meet the needs of older adults living in urban environments.

As the population ages, affordable housing in urban environments is needed to support low income, vulnerable seniors. Solutions and strategies must involve tenants in their design, maintenance and sustainability. The research explored housing transitions of older adults who were relocated from subsidised housing into redeveloped affordable housing in Richmond, British Columbia, Canada. 25 interviews, 6 participatory mapping workshops and 16 photo-voice sessions were conducted to understand how:

(i) sense-of-place is experienced by older people relocating into an affordable housing development;

(ii) lived experiences can be translated into formal and informal supports; and

(iii) to involve older people and other community members as active ‘place-makers’ in community planning and development. The project developed a set of guidelines for how to integrate sense of place in affordable housing developments for older adults.

Related outputs:

Place-Making with Seniors Research Team (2014) ‘Our Place, Our Space: Resident Stories and Place Priorities’, Gerontology Research Centre, Simon Fraser University.

Available at: www.gvss.ca/PDF-2014/Sense%20of%20Place%20English.pdf
This is a longstanding project/research interest examining the anatomy of commercial property cycles.

The research has looked at the changing relationship between rents and capital values through a cycle, the associated variation in market transaction activity and the influence of the scale of investment funds and bank lending.

Bank lending for investment and development through a cycle is considered. The impact of the property boom on green office development has been assessed. It has also examined the changing relationships between the yields on government bonds and commercial property yields. This particular research was funded by the Investment Property Forum. The research has focused primarily on the UK but has taken a global perspective, examining the experience of Australia, Europe and the USA.

Related outputs:


Jones C., Livingstone N. and Dunse N. (forthcoming) ‘The impact of a green premium on the development of green offices in the UK’, *Journal of Sustainable Real Estate*.


Oyedokun, T., Dunse N. and Jones C. (forthcoming) ‘The impact of a green premium on the development of green offices in the UK’, *Journal of Sustainable Real Estate*.


Over the last thirty years or so a new dispersed sub-regional urban system has emerged in many developed countries.

Key accessibility relationships have been transformed inevitably leading to a ‘rationalisation’ of the national and local retail hierarchies.

Out of town centres and retail parks together with superstores have become common features of the urban landscape. Some of the long term culminations of these trends have been stressed in a series of well publicised reports, notably The Portas Review. This research seeks to assess the underlying economics and quantify the changing form of retail hierarchies, including the consequences for rent patterns and the spatial pattern of shops. In particular the impact of online sales and the role of planning has been examined.

Related outputs:


A collaboration with the Saltire Society to record and reflect on distinctive developments in Scottish rural housing.

This is a project that reflects on how the best in rural housing design makes a vital contribution to cultural, social and economic life in Scotland as series of rural housing studies drawn from recipients of the Saltire Award for Housing.

Our themes include:

**Local Production**

Distinctive procurement methods such as self-build and housing co-operatives devolve power and resources to a local level. How can housing contribute to rural economies and societies? These homes are often resources of art, literature and performance that define and explain the places around them.

**Ecological Response**

Many homes are exemplars to use resources sparingly and live a life less dependent on fixed infrastructure. They push boundaries exactly because of the challenges and opportunities that their contexts bring.

**Landscape Relations**

The rural landscape is often untouchable for development, even if to sustain and nurture communities. Many successful rural housing projects have an intelligent and mutually beneficial relationship with their host landscape. The research builds a comprehensive resource to illustrate the regenerative potential of good housing design in the countryside to include:

- Record drawings to a common template and format.
- Interviews with architect/occupiers.
- A photographic survey of the building.
- A publications and media bibliography.
- A text for each project.

The project will help mark the Society’s Housing Awards anniversary. The work will be launched as a digital publication and website towards the end of 2018. A book will be published in 2019.

Analysis of quantitative datasets and qualitative/quantitative case studies to learn lessons for delivery of genuinely affordable housing in the South West of England.

In the context of national problems of housing affordability and delivery, the study examines the specific issues in the South west of England, including low wages, high house prices and popularity of second homes. The study seeks to enable planners and others to get a better idea of what has been happening to housing delivery and house prices in the South West with an aim of increasing understanding about the ways in which the housing market is changing and to assist in the adoption of more appropriate approaches in the delivery of housing that is genuinely more affordable.

The research analysed a range of data sources to track issues of affordability and housing supply in the South West, in comparison with other parts of England and the country as a whole.
UK HOUSING REVIEW

Compilation of annual review of housing policy and markets in the UK, including commentaries and extensive set of statistical tables; as well as an annual briefing.

The UK Housing Review celebrated its 25th edition in 2017. The Review has become an authoritative record and analysis of housing policy and markets in the UK, assessing a wide range of policies and housing outcomes, including Right to Buy, housing in devolved nations, homelessness, affordability, welfare reform as well as contextual chapters on issues such as the economy and public spending.

It contains more than 100 statistical tables drawn from a wide variety of government and non-government sources.

A shorter briefing is also published usually in the summer. The Review was founded and led by Steve Wilcox until 2017, when Mark Stephens assumes this role.

WELSH GOVERNMENT RENT SETTING REVIEW

The project will evaluate the policy to restructure social rents in Wales and test the effect of reforms.

Following the Essex Review of social housing in Wales, the Welsh Government adopted its recommendations to review rent policy in the social rented sector which was subject to anomalies between social landlords and different parts of Wales. A new rent standard was adopted and the 2014 Housing (Wales) Act required social landlords to set average rents within band limits.

This project reviews the progress and experience of landlords to date through a scoping review, survey of all social landlords and case studies. It will examine the perceived fairness of the new system and its impact on the capacity of social landlords to deliver new affordable housing. Potential reforms will also be modelled.
Flexible formwork offers an alternative perception to the production processes of concrete and other materials.

Concrete has been described as a material without history. Without the crafts associated with metalwork, carpentry or stonemasonry, but reliant on elements of each of these. A forlorn mongrel that now dominates much of the built environment. Sometimes seen as a process rather than a material itself. Its character and expression conditioned by the carpenter using rigid timber to give form to the compliant fluid.

Using flexible formwork challenges the existing paradigm initially seen as counter intuitive in comparison with conventional rigid systems. It is a disruptive technology that is now gaining traction in mainstream practice. ESALA has been involved in the study flexible formwork for concrete for over 12 years and has undertaken many different studies exploring: construction process, complexity of form, precision and material behaviour through a series of research led workshops with architecture and design students. The first book that explored fabric in conjunction with University of East London was based on these workshops. Since then further studies have been undertaken including various live projects such as the Fenchurch Garden at the RHS Chelsea in 2009 and more recently the installation of panels and landscape elements at Edinburgh Gateway in 2016.

Current research includes: experiments in the use of cement replacement, GGBS and PFA in conjunction with fabric texture and permeability for contrasting tonal variation; a series of workshops in exploring construction process in practice: in Austria with DOKA GMBH, comparing with rigid systems, in Switzerland with Creabeton Materiuax AG on the use of highly flowing concrete in architectural elements and introductory workshop into fabric forming techniques in conjunction with the Royal Danish Academy at South East University, Nanjing, China; the completion of a doctoral study into the use of grid-shells as re-deployable formwork; the culmination of an extended study into the behaviour of non-prismatic columns.

Very little information exists on the behaviour non-prismatic columns in concrete, most probably due the complexity of construction using conventional rigid formwork. Flexible systems are simple to construct. Over 80 structural tests on varying geometries of column and results show that relatively subtle changes in shape can influence the strength significantly. It is possible to optimize geometry to improve performance whilst simplifying construction process.

Related publications:
**SCAN-VS-BIM**

Using Building Information Models to smartly process point cloud data produced by modern reality capture technology.

This highly influencing work aims to integrate novel reality capture technology like terrestrial laser scanning with Building Information Modelling to speed up the processing of the point cloud data produced by the former.

The goal is by aligning the 3D point cloud data with the Building Information Model, the geometric and semantic information of the model can be used to smartly interpret the data. This technique has been shown to have potential to objectively track construction progress, and more interestingly to robustly and automatically conduct dimensional quality control.

**Related outputs:**
- Website: [http://cyberbuild.hw.ac.uk/projects-scanvsbim.html](http://cyberbuild.hw.ac.uk/projects-scanvsbim.html)

**SCAN-TO-BIM**

Reconstructing 3D Building Information Models of buildings interiors from point cloud data produced by modern reality capture technology.

Scan-to-BIM is the process of capturing and processing 3D information (augmented with colour and other information) to generate a 3D Frédéric Bosché BIM model of an existing facility. This process is of significant and ever increasing importance to the construction industry, because 50% of the construction industry turnover relates to refurbishment and renovation (as opposed to new construction). Yet, this process remains manual, skilful and time-consuming.

This on-going collaborative project has initially focused on the modelling of the structure of buildings but is also now uniquely focusing on other secondary components, like electrical components (lights, switches, sockets, etc.).

**Related outputs:**
Social Life Cycle Assessment methodology for the construction industry.

The main aim of this PhD research is to support the practical implementation of the social impact assessment in the construction industry in order to improve the social performance of architectural projects. This research will look closely to the Environmental Product Declaration (EPD) system that, in environmental terms, is helping the construction industry to communicate transparent and comparable information about their products in order to propose a similar declaration in social terms.

With this objective, the research will also develop an S-LCA model, based on the UNEP/SETAC framework proposed in the “Guidelines for social life cycle assessment of products” that will be focused in the social performance of construction materials. This double action will boost the understanding of the social repercussions of the construction industry, will raise awareness about the social impacts linked to this sector and will help with the practical and methodical implementation of social considerations in the construction industry by providing useful information to the design teams and to policy makers.
Assessing the validity of fuel poverty-related data collected by a social enterprise partner, and suggestions to improve their work.

The Kyle of Sutherland development trust, a social enterprise in the Highland and Islands region of Scotland, has been collecting data on its approach to reducing/mitigating fuel poverty in an area where this problem is widespread (up to 80% of the population in some sectors).

We were hired via Interface to assess the statistical robustness of data collected on fuel poverty and health/wellbeing outcomes for the population in relation to measures implemented to combat fuel poverty by the organisation.

Due to problems with the data collection methodology and the small scale of data collection (as well as other factors), we were only able to produce limited results.

We also came up with recommendations to KoS in order to improve data collection and methods in the future, and are currently applying for another grant to advance this.

Modelling and understanding UK energy systems for future scenarios.

An ‘energy system’ is a network comprising energy demand, distribution/infrastructure and energy supply. Across such a system, there are different terminologies, metrics and models used to help guide efficient and robust design. CESI is looking at applying a ‘system of systems’ approach to integrating different models together (informed by real data and case-studies), such that genuinely low-carbon and resilient systems can be created within a context of future change.
ENERGY EFFICIENCY RETROFITTING SERVICES (EERS) SECTOR CHARACTERISTICS AND ROUTES TO INCREASED ACTIVITY

Breaking down barriers to achieve UK domestic energy efficiency at scale.

Within the UK, energy efficiency improvements within the existing housing stock is a key area in which governments have attempted to increase rates of activity to boost carbon reduction and end user cost savings. The most recent UK policy, the Green Deal, was a pay as you save scheme, linking the capital cost of improvements to ongoing energy bill payments. The success of this policy was limited, with minimal uptake in comparison to expectations. This research investigates the viewpoints of retrofit industry practitioners, to assess their experiences of working under the Green Deal, and evaluate what pathways could be available to move forward into the future. UK and German based individuals interviews were used to compare experiences, along with UK group interviews and focus groups to develop findings via a grounded theory approach, to illuminate possible future strategies for UK retrofit.

Key findings suggest EERS expansion is most successful if policies are designed more holistically; UK policies show strategies which focus on simply the property and not the occupants have their disadvantages. Therefore, a move away from marginal financial incentives, such as the Green Deal’s loan structure, to a wider consideration of how policy tools interact with supply chains and end users, would enable increased impact.

Related outputs:


Making better use of renewable electricity in Indian rural areas through an understanding of supply and demand.

This project will demonstrate the benefits of demand management strategies in distressed grids in developing nations. It will use energy storage in the form of batteries and demand scheduling to improve energy security and to reduce curtailment of renewable generation.

The project will develop research that has been demonstrated in a European context and prove its value in the context of developing nations. It will address the challenges of providing rural communities in developing nations with access to reliable, clean, affordable energy, particularly where the electricity provided via the grid is unavailable or unreliable.

Related outputs:


Website: www.ncl.ac.uk/cesi/
Characterising supply and demand mis-matches in India.

A series of workshops were carried out in India to understand the concerns of householders, policymakers and local government towards energy use in the built environment, and the use of available renewable electricity to help alleviate these concerns.

Impact of ground albedo on the performance of PV Systems.

The total incident irradiation on a surface such as a photovoltaic (PV) module is the sum of beam, sky-diffuse and ground reflected radiation. Ground albedo or ground reflectance is defined as the ratio between the ground reflected radiation and the global incident radiation. A constant albedo value of 0.2 for bare ground and 0.5 for dry tropical localities is widely accepted and is used in the modelling of PV systems. The real albedo values of foreground surfaces are different and hence using a constant value may be unsuitable to accurately predict the output of PV systems. This research investigated the real albedo values of various foreground surfaces and how it is affected by the factors such as ageing, solar altitude, rain and cloud cover (sky conditions).

To investigate the impact of such factors, an experiment was set up to measure the albedo of conventional foreground materials (grass, sand and cement) and non-conventional materials (white pebbles, white paint, white tiles and aluminium foil). Research has shown that non-conventional materials increased the slope irradiation and ultimately the energy generation of PV modules. These results were validated using the long-term data from the Garston and Edinburgh database. A new computational tool was developed, which considers various albedo values of foreground materials simultaneously for any tilt angle of a PV module to compute the ground-reflected component.

Related outputs:
STOCHASTIC MODELLING OF ENERGY DEMAND IN FINDHORN ECO-VILLAGE

Statistical aggregation of high temporal precision electrical demand datasets of dwellings.

High resolution electrical demand data can help characterise specific activities in buildings, that correlate with behaviour, heating technology and construction. However, to understand energy demand at a regional or national level, it is necessary to convert this information into a different spatial and temporal scale.

Through statistical aggregation procedures, this project takes individual building data from Findhorn Eco-village and synthesizes virtual demand profiles that can be aggregated to, for example, a sub-station level for a community of buildings. This is also validated against real sub-station electrical data to check the success of the method.

WHEATLEY GROUP TECHNOLOGY AND DEVELOPMENT STRATEGY 2020–2025

Wheatley Group and the University of Edinburgh will work collaboratively, bringing together our collective expertise, knowledge and skills to understand property technology trends and innovations globally which could influence Wheatley Group area.

By collecting and sharing ideas and views from stakeholders from across Wheatley Group, the project team will identify areas of most potential interest from the broad field of property technology. A global evidence review will identify interesting areas of practice and innovation which will be tested with customers and staff of Wheatley Group.

An iterative process of sharing technical, experiential, practical and academic learning and knowledge across and between Wheatley and the University will identify the key opportunities which could be applied in the Wheatley Group context. Focus groups, interviews, interactive design scenarios and a comprehensive desk review will be utilised to deliver the required outputs, to inform Wheatley Group Technology and Development Strategy 2020–2025.
LEARNING ENERGY SYSTEMS

This short project is developing innovative ways of engaging people with energy use in public buildings. Working with Linlithgow Primary School this project builds on earlier research examining the juncture between energy, data and people.

The playful project engages school children in gathering, collating and evaluating energy data in their classroom. Schools currently use 50% more electricity than predicted through energy modelling, and it is recognised that people using the buildings contribute significantly to this consistent over use of energy.

The ‘Energy Diary’ used in this project responds to crowd-sourced digital data produced by the pupils using a webapp in the classroom. In addition, a web dashboard will be created to provide overall visualisation of energy use from all participants in the Living Lab.

Socio-Techno-Economic Design of Energy Systems Driven by Community Needs

Developing a method that builds on traditional systems-modelling approaches in order to help specify and design energy conversion, transmission and storage technology.

With steep vectors of global change in urbanisation and climate, and the resultant pressures on building stocks and energy infrastructure, traditional energy systems approaches are ripe for revisiting. We propose that sustainable delivery of secure, affordable low-carbon energy requires design methods with the energy needs of a community as a focus. In order to achieve this, we propose to develop a method that builds on traditional systems-modelling approaches in order to help specify and design energy conversion, transmission and storage technology to meet the service needs of an existing and growing global middle class, whilst also catering for more vulnerable communities.

This will allow for a standardised form of resource identification to highlight drivers of a community energy system, but also transforming the way such modelling considers the nature of energy demand; viewing this as a series of semi-qualitative metrics.

Three communities have been identified as case studies, Orkney, UK; Penang, Malaysia (ODA Upper Middle Income) and Santiniketan, India (ODA Lower Middle Income).
Community electricity demand modelling through applied aggregation algorithms to build community-level profiles in India.

Whilst many countries are seeing significant change in the use of energy in homes and the provision of that energy through local energy networks, the pace of change recorded in India is particularly notable. The “refresh” rate of the housing stock is high (with new build constituting a much higher percentage of the housing stock than many developed countries) and, simultaneously, the approach to delivering electricity to those homes is changing (e.g. the growth in distributed renewable generation, such as solar photovoltaics). If further change is to be planned amongst this already uncertain landscape, in the form of community-wide energy demand reduction strategies, then a full impact of such measures must be understood.

Minimising cooling requirements, controlling/managing appliance loads and encouraging distributed generation should all be promoted in a way that i) is consistent and complementary to a functioning local electricity network and ii) relate to measures that are likely to be accepted across communities, rather than having only niche appeal.

The CEDRI project will allow for community electricity demand modelling through applied aggregation algorithms, converting small samples of individual building demand profiles into community-level profiles. After carrying out surveys and workshops with householders, the project will identify the demand-reducing measures likely to succeed in such regions (informed by real case-study communities and empirical data) and apply these to the community demand models to quantify potential impact.

The ability of such changes to improve the local energy network will be fully investigated, such that measures deemed to successfully reduce total energy demand can be managed in a way that improves key characteristics of that network (such as frequency, voltage and peak demand). The project will therefore provide guidance that will ensure that approaches to demand reduction “co-evolve” with changes in the methods used to supply electricity to residential communities, over future timescales that already have considerable levels of uncertainty.
Enhance is a multi-disciplinary project, led by Dr Nigel Goddard (School of Informatics), Professor Jan Webb (School of Social and Political Science) and Dr Kate Carter (Edinburgh College of Art) and funded by the Engineering and Physical Sciences Research Council (EPSRC).

The project is part of the Edinburgh Living Lab – a city-wide collaboration which aims to bring academia, the public sector and the third sector together in order to work with the community to co-design, test and implement new services, processes and products that generate social, environmental and economic value. Enhance has taken up a 12 month residency at Assembly Rooms, to help the venue understand and reduce its energy usage. The Georgian building earned a place on the project after a lengthy selection process, primarily based on the venue’s continued commitment to sustainability.

The Assembly Rooms is owned and managed by the City of Edinburgh Council. Shona Clelland, Cultural Venues Development Manager at the Council, comments: “Being chosen to participate in the Enhance project is a great way for us to push the venue in terms of sustainability and further develop our green credentials. Our team is very excited to welcome the researchers in and start working with them to identify problem areas and develop solutions to reduce our energy usage over the course of the year. We’re ready and willing to take responsibility for our carbon footprint and hope that the learnings from this project can deliver long lasting impacts on the business.”

Councillor Richard Lewis, Culture Convener, adds: “We hope this unique project can provide inspiration to other sites in Edinburgh to reduce their energy output and, subsequently, the city’s carbon footprint. Already as a Council we have installed LED lighting at the Usher Hall and more recently the Scott Monument. This is another great stride towards increasing the sustainability of our cultural venues.”

Website: www.enhance-project.org/
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