The Edinburgh Strategic Alliance (ESA) in Architecture, Built Environment and Planning: Research Projects 2020

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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Material collated by Harry Smith (Heriot-Watt University) and Alistair Fair (University of Edinburgh) for the Edinburgh Strategic Alliance.

https://sites.eca.ed.ac.uk/ekep/

Design, Nicky Regan, Edinburgh College of Art.

www.eca.ed.ac.uk
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The Edinburgh Strategic Alliance (ESA) in Architecture, Built Environment and Planning 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, the two institutions 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 Research Committee to foster excellence in research and support a range of techniques and approaches to enquiry. In 2019, we inaugurated a joint ‘research space’ in central Edinburgh, suitable for meetings, retreats and events. 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 fourth 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 in 2020. Further information including a comprehensive list of research outputs can be found on the schools’ websites.
CHAPTER 01

Innovative Design
LIQUID DRAWINGS

An interrogation of liquidity as a metaphor for architectural design.

Drawing – a form of pollution – remains strangely unfazed by the emergent liquidity and unpredictability of the anthropogenic trace, clinging to geometry and its presumed ability to order, cleanse, measure and name. Whereas current modes of architectural notation depend on the stability, reliability and abstractability of the point/line, what would projects predicated on the liquidity and situatedness of the drop entail? Through both chronophotographic protocell drawings and a fluid collage of textual fragments, the project attempts the first steps in a ‘liquid’ approach to design – one predicated not on decisions and control but on encounters.

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:
Falls of Tarf, Landscape Study, Lisa Mackenzie.
August 25, 2020 marked the tenth anniversary of the author’s weekly research blog titled *Reflections on Technology, Media and Culture*. This blog site is a public archive of the author’s research findings drawn from philosophy, cultural theory and popular literature. It tries to develop and rehearse new understandings of current affairs, architecture and digital technology. Generating regular blog content has enabled the author to develop material for three peer-reviewed books published since 2010, and provided a channel to revisit, review and update the content of previous publications. The author’s recent books also refer to individual blog posts providing the reader with more detailed explanation and experimentation.

Text-based blogging, or weblogging, developed in the 1990s as a medium for recording and presenting date-stamped content, accessed through a single URL, and presenting the most recent blog post at the top of the blog’s home page. Blogs are typically hosted on platforms such as Wordpress.com, Tumblr.com or institutional sites, with content available privately behind password protection, or publicly. The popularity of text-based academic blogs has been overtaken in some cases by video blogs (vlogs), audio podcasting and a plethora of blog genres competing for attention, delivering popular interest, and providing political, journalistic and promotional content. Most online advice now about blog writing focusses on maximising the number of visits to your blog site, how to gain revenue through advertising delivered via the blog platform, growing product sales, and keeping in touch with potential customers.

For the author, the main value of the blog is to keep up the regular practice of research writing and in manageable theme-based chunks. All content is indexed automatically which overcomes the difficulty of recalling every thought from an archive of 523 short essays, each averaging about 500 words. Blogging provides a way of searching and recalling the author’s intellectual archive. URL links to individual posts also provide a shorthand means of communicating with research students. Each blog post contains references to academic and popular literature sources. It also provides a medium for experimentation with video, audio and graphic content.

Website: https://techmediaculture.com

‘Structuralism in architecture: not a style but a tool for critique’, followed by ‘What’s wrong with parametricism’, ‘Why cartoons have animals’, and ‘The opposite of architecture’.

The *Reflections on Technology, Media and Culture* site operates within an academic model unencumbered by the need to maximize hits or market product, though it does serve as a means of disseminating research and promoting research outputs.

Wordpress provides helpful view statistics that indicate topics that have most attracted readers. The most viewed posting by far is called ‘Structuralism in architecture: not a style but a tool for critique’, followed by ‘What’s wrong with parametricism’, ‘Why cartoons have animals’, and ‘The opposite of architecture’.

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Website: https://techmediaculture.com
Steganography for architects

More recently, the blog site has provided an appropriate medium for the author to pursue the theme of cryptography in architecture. As reported in the last edition of this ESA compendium, there is a new impetus to investigate hidden city codes, brought about not least by the security implications of supposed smart city infrastructures and the entailments of high speed 5G networks. Cryptocurrencies, peer-to-peer monetary transactions and automated smart contracts require institutions and citizens to choose how they adopt, adapt, or resist the digital city.

Cryptography serves as leitmotif for this project, which references the architectural space of crypts, catacombs, and hidden underground places.

Leon Battista Alberti (1404-1472) the author of On the Art of Building invented a method for encrypting messages, introducing a design for the cipher wheel that would enable the passage of hidden messages between rulers and their generals. Alberti’s contribution secured architecture’s authority in the domain of “the cryptographic city”.

Steganography is the art of concealing messages so that casual observers are unable to detect that anything is being concealed. Cryptographers apply that term in particular to images hidden within other images. In so far as architecture deals in screens, patterns, displays, shapes and images it is subject to the question of what buildings and their surfaces conceal.

Related publications:


Website:
http://techmediaCulture.com/tag/steganography/
Experimental algorithmic protostructures.

This project relates to my long-term research related to algorithmic design, advanced digital fabrication and manufacturing techniques for lightweight protostructures. In collaboration with two industrial partners, Dirce Medina Patatuchi, from London-based practice Heatherwick Studio and Carlos Bausa Martinez from Foster + Partners, we have won the competition for the international Festival of Architecture 2019 in Montpellier: a parametrically generated pavilion structure, designed through the use of advanced computational tools and to be constructed through the use of digital fabrication, at ECA.

The project creates a platform to share emerging research practices related to the use of advanced computation and digital fabrication between academia and industry, addressing a wide audience (ECA staff, student community, industrial partners, manufacturers and external public). The project promotes sustainable, intelligent and material & tool appropriate ways of integrating emerging digital practices into the creative practice, thus empowering and inspiring those who wish to work or further engage with advanced computational tools.

This research is a continuation of my research-led teaching on UG and PG level at ESALA, engaging with algorithmic form finding, parametric optimisation, low-cost materials and circular economy.

Paper test model, scale 1:3, Papillon D’OR, FAV 2019
Montpellier. Image: Cristina Núñez.
Eight original wind tunnel and water table prototypes use digital and analogue architectural fabrication techniques to visualise airflow for use as a contemporary design tool.

Wind tunnels and water tables make airflow associated with pressure-induced natural ventilation, such as cross-ventilation, visible. While physical environmental simulation devices have largely been supplanted by digital simulation, this research suggests there is value in working materially with air and water flow as a means for understanding building environmental mediation. Four wind tunnel and four water table prototypes hone the use of environmental models as an architectural design methodology. Prototypes are designed, constructed and evaluated based on their ability to create a steady-state environment of legible airflow. It is through the act of constructing the instrumentation of the model and the materialisation of air that models reveal architectural insights about environmental mediation.

These insights are in some cases tectonic, revealing ways of thinking about joints, surfaces, and assembly logics. They are in other cases responses to working with forces associated with pressure of air or weight of water. Fundamentally, the prototyping process revealed air’s extreme sensitivity to both constructional anomalies and external disruption, revealing the complexity of creating steady-state environments.

Related publications:

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.


Transformative Ground explores how new expressive forms and design sensibilities, based on distinct societal and environmental issues, have emerged in response to the context of post-industrial landscapes.

For several decades now, the increasing presence of post-industrial sites has opened up a new territorial ground for landscape architecture, disrupting conventional ideas and aesthetics of space making that have been deemed inadequate for dealing with the structural complexities, toxic histories, and cultural ambiguities of abandoned sites. There is a highly contested quality to many post-industrial sites, where abandonment and opportunity, decay and growth, history and erasure, create a compelling entanglement between seemingly contradictory conditions. These contextual realities are challenging, requiring new conceptualisations and spatial tactics to negotiate issues that are often complex, temporal, beyond perception and in extreme cases, irresolvable.

This project aims to capture a sense of how this period of radical rethinking has challenged long standing conventions, as new conceptualisations and shifts in aesthetic appreciation have progressively opened up in response to the emergent territory of the post-industrial landscape. The project has so far resulted in a book that provides critical purchase on the rich conceptualisation of landscape in the contemporary field, providing a sense of how post-industrial sites not only offer a transformative ground for society and nature, but act as a progressive field of concern for landscape architecture.

Related publication:
CHAPTER 02

Hybrid Design Processes and Digital Media
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:
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”.

In this way, we hope to be able to make small-scale, local workshop events more directly relevant to developments on a larger scale, offering an enhanced opportunity to drive social innovation.

A particular challenge of this perspective is to see how to formalise the data involved in the weave – technically, to develop an ontology for the information – without distorting or impoverishing the data, and while respecting the need to accommodate flexibility and change. We base this on the notion of an ontology as being a focus for finding and revising inconsistencies and disagreements, rather than a way to capture a more objective structure.

Publications:

This research explores the emerging future field of fabric formwork for concrete structures in combination with silicone 3D printing.

The showcased material experimentations represent studies which focus on the simultaneous use of fabric formwork and textile 3D printing in order to create a new type of material process for forming and fabricating non-standard geometries applied to architectural elements. Textiles in combination with 3D printed patterning are seen in this context as tools for form generation and to a certain extent also for form control.

This practice-based research offers a new alternative to predominant fabrication methods for complex geometries, showcasing the benefits of hybrid digital crafting techniques. The developed manufacturing strategy will be explained through a series of material experimentations and resulting prototypes. The following studies investigate fabrication processes and surface texturing methods for the manufacturing of small and large-scale prototypes such as tiles or concrete columns.

The studies represent material investigations with a hybrid material system – textile, concrete and 3D printed silicone – and are process driven, concentrating more on process experimentation – seen as a digital crafting methodology – rather than focusing on a predefined design output. The fabricated columns have been exhibited during the Research Through Design Conference at the National Museum of Scotland and the Futurebuild Show in London, as part of the exhibition of the Concrete Centre.

Related publications:

Clockwise from top left:
Self-built 3D printer.
Removal of textile formwork with
3D printed silicone pattern from
waisted column.
Twisted concrete column, full scale.
Twisted concrete column and
removal of textile formwork.
Images: Cristina Nan
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:

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:
Prototypes of dissent: 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:

BY: Miguel Paredes Maldonado
University of Edinburgh

FUNDING: Erasmus + Staff mobility grants
External funding from the Università degli studi di Cagliari

YEAR: 2015 – 2020
Scopic Practice is a project that explores forms of media based practice concerned with revealing qualities of the living world.

Scopic Practices can be defined as creative processes that bring a phenomenon beyond immediate perceptible grasp into scope, involving the selective and methodological use of media based instrumentation to experimentally simulate and reveal the transient and ephemeral qualities of a range of natural phenomena. At a time of significant environmental concern, the projects aims are to consider how advances in technology and aesthetic theory have informed how the environment is experienced and imagined, to develop understanding of how process-oriented and time based practices can interpret and reveal a telescopic range of scales; from the cosmic, atmospheric, seismic, sonic, biomorphic, to the microscopic.

The project has both theoretical and practical aims; to synthesise knowledge derived from precedents in contemporary practice, including art, architecture and allied disciplinary fields, which in turn underpins practice-led experimentation.

Outputs have so far involved a series of academic papers, with the prospect of working towards a major publication that outlines shifts in aesthetic theory cross-related with precedents from an expanded field of contemporary practice. Practical exploration has involved a series of experimental works that were captured in a BAFTA Scotland nominated documentary short, Plastic Man, directed by artist Yulia Kovanova. Through this collaboration the intention is to produce a feature length film that more fully expresses ideas derived from the research.

Related publications:

Website:
http://plasticmanproject.org/
Tectonics of the Immaterial: The Material Footprint of the Cloud and Its Digital Infrastructures

The technological shift towards smart entities – driven by automation, machine learning and IoT – mostly perceived as an immaterial phenomena, decoupled from a physical dimension, resides on a vast material footprint, which exists almost unnoticed in the suburbs of our perception.

Tectonics of the Immaterial, a research-led design studio, engages with the notion of data as an immaterial entity which revolutionises the 21st century, initiating irreversible global dynamics, but at the same time relies upon a physical footprint, comprised of infrastructure and buildings.

Data, upon which the ‘smart–depends and feeds, presents itself as a new currency for architecture. The foundation for its existence are data centres. They epitomise in architectural terms the reinvention of the black box, as known in the aircraft industry, secluded form the system and continuously recording. My research increases its resolution of inquiry, leading to another facilitator of the ‘smart– rare metals and minerals.

Most smart-devices, connected to the global network of data centres, terrestrial or submarine cables and satellites, rely upon lithium-ion batteries. The extraction of lithium is correlated to large scale territorial transformations impacting on landscape, infrastructure and the urban.

This research addresses the material footprint of data and subsequently the ‘smart– on different levels of inquiry: from territorial to landscape, from urban to the built. What are the territorial and urban implications of this current technological shift? How smart is smart, when it depends on a vast material footprint, often messy and dirty? How can architects and designers use their expertise to inform or develop digital strategies on these different levels?

This work is mirrored in research-led teaching throughout the past three years during an 11-weeks design studio in 4th year BA/MA Architecture, focusing on the presented topics, within a global but also local – the Orkney Archipelago – context. Strategies are being developed to repurpose obsolete oil and gas infrastructure for digital ones. The research has been thematised in a dedicated session at the ‘Smartness? Beyond Discourse and Practice’ Conference 2018 at the TU Eindhoven. Outputs of this research will be presented this year at the AHRA Conference in Dundee.
CHAPTER 03

Health, Wellbeing and Environment
A complementary programme of research and development to deliver innovation and change to later life care.

The Advanced Care Research Centre is a major initiative to deliver world-leading interdisciplinary and cross-sectoral research, translating into health and social care policy and practice, building and informing the development of new companies, products and services and informing the wider societal response to the challenges of population ageing.

Drawing on their long-standing expertise in co-producing research and design with older people, OPENspace and ESALA will contribute particularly to Workpackage 4, ‘Understanding the person in context’. This workpackage uses innovative and established social science and co-design approaches to understand how individuals in later life manage the challenges posed by changes in physical and mental function in the context of their physical environment, social support, personal financial circumstances, community resources and statutory services.

The findings and data generated will directly inform the focus, design and interpretation of the other programmes. The research led by Catharine Ward Thompson will use the concept of ‘environmental support’ to explore how the built and natural environment enables or frustrates people to flourish in older age.

Project website: https://www.ed.ac.uk/usher/advanced-care-research-centre

**ADVANCED CARE RESEARCH CENTRE (ACRC)**

BY: Catharine Ward Thompson
University of Edinburgh

WITH: Bruce Guthrie
Larissa Pschetz
Chris Speed
Heather Wilkinson
University of Edinburgh
Louise Robinson
Katie Brittain
University of Newcastle
Linda McKie
Sue Lewis
SSPS

FUNDING: £20m Legal & General

YEAR: 2020 – 2027
Results of co-design work with older participants from Mobility, Mood and Place research project, by Rosanne Knight, Jonathon Phillips and Stephanie Sharpe.
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.

Responding to these challenges, this research intends to answer the following research questions:
- How do older adults experience ageing and sense of place across different urban, social and cultural contexts? In what ways can urban environments support the rights of older people to age in place?
- What would age-friendly cities and communities look like if they are to support the sense of place needs of older adults living across different urban and cultural contexts?

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).

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.

We will use a range of methods to achieve the project aims including sense of place surveys and semi-structured interviews alongside experiential methods including ‘go along’ walks, photo diaries and community mapping exercises to capture the place-based needs of older adults.
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 Brasil to come together to exchange findings, share methodological insights and shape the research process.
EDINBURGH’S THRIVING GREEN SPACES

Working with the City of Edinburgh Council to develop a new, 30-year vision for the capital’s green spaces.

The University of Edinburgh is contributing to a project led by the City of Edinburgh Council’s Parks, Greenspace and Cemeteries service, focused on the Capital’s green spaces, to ensure their ongoing enhancement, protection and care. The Thriving Green Spaces Project will shape an ambitious new vision for Edinburgh’s natural environment and produce a 30-year strategy and action plan to deliver that vision. The project, the only one of eight Future Parks Accelerator projects that is in Scotland, is funded by a grant from the National Lottery Heritage Fund and the Natural Trust, to enable local authorities to develop bold and innovative financial and management solutions for their green spaces against a backdrop of financial uncertainty. OPENspace’s contribution to the project is threefold:

(a) Developing a monitoring and evaluation framework for green space quality, use and benefit for citizens and visitors;

(b) Developing tools and protocols for gathering data on individual projects to serve the monitoring and evaluation framework; and

(c) Co-design work with stakeholders and local communities.

Our students have also been involved in supporting the project. Our Master of Landscape Architecture students have engaged in co-design work with local communities to produce design exemplars. Our MSc students in Landscape and Wellbeing have contributed to online survey design and analysis of findings on green space perceptions, access and use, as part of their dissertations, to support better understandings of these issues despite the Covid-19 lockdown. And some of our PhD students have supported development of methodologies to explore the potential for future green space design and use, and contributed to new ideas and understandings in the process.

Project website:
https://www.thrivinggreenspaces.scot/
Researchers, clinicians, practitioners and policymakers all working with local citizens who have the most to benefit from better access to and use of quality green and blue spaces.

This work is funded by UKRI, via MRC, under their UK Prevention Research Partnership (UKPRP) programme. A Stage 1 proposal was successful and the collaborators now have 8 months of consortium development funding to work up a full, Stage 2 proposal for a major consortium research project, to be submitted by the end of the year.

The environment that we live in or visit, for example parks, canals, and forests, can help us live a healthier life. However, communities living in low-income areas can have poorer access to such spaces or use them less. They also have less voice in decisions affecting their local spaces, at either local or national level. We propose a new partnership to work with local citizens who have the most to benefit from better access to and use of quality spaces.

We will work collaboratively to identify poor quality and underused spaces through citizen-led approaches, and then work with them to develop and/or modify outdoor spaces so that they are high quality and fit for purpose. We want to ensure that no community is excluded from benefit.

We plan to bring multiple sources of data together so we can effectively determine what works across multiple projects and settings. So, whilst citizens can be involved in collecting data about whether the space has improved their health and wellbeing (through a bespoke app), we can also use other data on health, wellbeing and the environment that is routinely collected by local councils and governments.

**GROUNDSWELL: COMMUNITY AND DATA LED SYSTEMS TRANSFORMATION OF URBAN GREEN AND BLUE SPACE FOR POPULATION HEALTH: CONSORTIUM DEVELOPMENT GRANT**

**BY:** Catharine Ward Thompson  
*University of Edinburgh*

**WITH:**  
Ruth Jepson  
*UoE HiSS*  
Ruth Hunter  
*Queen’s University of Belfast*  
Sarah Rodgers  
*University of Liverpool*  
*University of Exeter*  
*University of Glasgow*  
*City of Edinburgh Council*  
*Sustrans*  
*NHS Lothian*  
*Eastside Partnership*  
*Ashton Community Trust*  
*Department for Infrastructure*  
*Belfast City Council*  
*Administrative Data Research Centre NI*  
*Public Health Agency NI*  
*Liverpool City Council*  
*The Mersey Forest*  
*Liverpool City Region LEP*  
+ 25 others

**FUNDING:** £50,000

**YEAR:** May – December 2020

*The Meadows, Edinburgh, being used by citizens in 2008.*
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

Sarah Payne, IWUN. Courtesy of Sarah Payne.
LIFECOURSE OF PLACE: HOW ENVIRONMENTS THROUGHOUT LIFE CAN SUPPORT HEALTHY AGEING

Does lifetime exposure to green space, air pollution and area-level deprivation affect cognitive ageing, brain health and biological ageing?

This is a follow-on project from the Mobility, Mood and Place (MMP) project led by Catharine Ward Thompson, OPENspace, which finished in 2007. The project is led by Jamie Pearce in the Centre for Research on Environment Society and Health, GeoSciences, and colleagues at the University’s Centre for Cognitive Ageing and Cognitive Epidemiology, PPLS.

Providing new insights into the how the places we live and grow older can be best designed to support healthy ageing has emerged as an important research and policy priority. Many studies have looked to identify the barriers to health and effective functioning for older people, and into producing environments experienced in older age that support people to age well.

However, we know much less about the aspects of environments experienced throughout life that might support the maintenance of healthy functioning in later life. This interdisciplinary proposal draws together expertise from geography, psychology and landscape architecture to utilise novel longitudinal datasets (including from MMP) to examine how place-based circumstances from childhood through the rest of life can enhance healthy ageing.

The study draws on a new framework labelled the ‘life course of place’ which helps us to examine how places evolve over time and matter at different points in the lifecourse in predicting later life health outcomes. The study utilises a set of robust indicators of healthy ageing available for Lothian Birth Cohort 1936 participants, collected through brain imaging, cognitive testing and biomarkers of biological ageing (telomere length and epigenetic clock).

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 tranquillity in our vibrant, buzzing cities.

Website: www.destress.hw.ac.uk
@DeStressRestore
DeStress survey on Maptionnaire software.
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.
CHAPTER 04

Global Cities, Spatial Planning and Place
CLIMATE CHANGE POLICIES FOR PEOPLE: IMPLEMENTING CO-DEVELOPED WATER GOVERNANCE AND SECURITY IN THE UPPER ATOYAC RIVER BASIN, PUEBLA

Conducting a broad range of stakeholder consultations to co-develop, test, and implement policies for improved water security in the Upper Atoyac River Basin, Puebla, Mexico.

Climate change is increasing the need for water governance measures in drought-prone areas. Our previous Newton project focused on understanding the diverse effects of climate change co-developing mitigation and adaptation strategies with local communities (including residents, government institutions and civic organisations) in Puebla. A major priority articulated by these communities was the urgent need for water security and improved water governance.

The proposed project aims to deliver impact based on the insights generated by the previous research in the Upper Atoyac River Basin (UATB) by conducting a broader range of stakeholder consultations to co-develop, test, and implement policies for improved water security.

We now focus on the whole basin, involving a wider range of data to enable long-term water security that will result in better-managed and more sustainable water resources for the entire basin. Lead researchers at the UK institution (UoE) bring expertise relating to co-production of the built environment, planning, equity, business, management and climate change. Partner institutions in Mexico (Iberoamericana Puebla & UDLAP) bring the necessary physical science and local technological expertise to develop water security indicators and how these may be adapted in relevant future scenarios.

Building from the collaborative work generated by the Newton grant, the proposed research will lead to a white policy paper on the implementation of water governance in peri-urban and rural areas that depend on water for irrigation, production and livelihoods, thereby building resilience and security in the face of climate change impacts.

The involvement of our in-country partner CONCYTEP ensures that policy recommendations will be relevant for, and trusted in, the local context. Outputs from this work will be transferable to many Global South contexts, where impacts of climate change are increasing human vulnerability in rural and rapidly urbanising communities.
ESA team visiting construction works at Parque Cuilléhuac, Mexico City.
DEVELOPING CO-CREATED SMART CITY SOLUTIONS FOR MANAGED ADAPTATION AND MONITORING OF HYDRO-METEOROLOGICAL CLIMATE CHANGE RELATED RISK IN MEXICO

Co-creating smart city solutions with communities, local government and other stakeholders to manage adaptation and monitoring of hydro-meteorological climate change risk in Mexico City.

The project will develop an interactive networking smart-technology, enabling city-communities to share best practice on monitoring climate change-related challenges, and to allow them to create solutions that enhance managed adaptation, in close collaboration with local and national institutions, and other relevant stakeholders. The research is structured around three work packages aimed to address the following questions: (i) how do local communities and local institutions perceive and adapt to climate change-related risks and what are the roles of private and public sector organisations in taking adaptive action? (ii) how could a co-created smart-technology help communities to monitor and adapt to these climate change risks? (iii) how can this technology, using community knowledge and experience, help create and influence climate change-related local and national policies?

The research will focus on a pilot case study in México City, where a traditional community is confronting flooding risk challenges. Using focus groups and semi-structured interviews, the research will implement an interactive dialogue between community members, government institutions, as well as NGOs and other stakeholders, including support agencies, and private businesses. This dialogue will result in the development of risk-mitigating strategies and actions, including smart technologies, which will be tested over the project, in order to evaluate pilot experiences and upscale these into a larger city area. Lessons learnt about risk management in Mexico City have the potential to be easily disseminated across the developing world.

Communities will be empowered through engaging in identifying, developing and testing strategies for risk-monitoring, mitigation and adaptation. The social, economic and political aspects of impacted communities, as well as an understanding the physical origins of climate change risks, will contribute to developing resilience and prevent the consequences of exposure to hazards. Finally, considering both the macro-scale and the local scale, understanding that change can emerge in collaboration with local communities and policy makers, the project will provide, along with best community practices, opportunities for interaction and negotiation between actors for increasing resilience and reducing vulnerability.
Community drainage works in Mexico.
Developing collaborative smart city solutions with communities, local government and other stakeholders to manage adaptation and monitoring of climate change risks in Puebla, Mexico.

The growth of Latin American cities in the last decades has led to an increase of vulnerable communities in informal settlements on land exposed to climate change-related risks, such as: surface, temperature, droughts, flooding, etc. heightening the need to improve the resilience of such communities.

To overcome this, it is essential to develop innovative, co-created strategies to manage risk and increase resilience at the household level. Smart City approaches offer an integrative perspective, establishing the potential for developing collaborative solutions involving city governments and technology contractors. However, these technological solutions tend to be dependent on top-down initiatives, which do not necessarily take into account the needs of, or benefits for people living in poor informal communities.

The aim of this project is to identify climate change-related challenges and possible ‘smart city’ strategies, through implementing an interactive dialogue between community members, government institutions, NGOs, private businesses and other stakeholders in Mexico. With a critical perspective and from a collaborative approach, ‘smart city’ strategies might bring innovative solutions that engage with communities, academics, technology contractors and local authorities in settlements affected by climate change-related effects. The project explores innovative, context-specific and co-created strategies for managing risk and increase resilience, responding to the needs of the most vulnerable, through two scoping pilot studies, one in Mexico City and in the other in a semi-rural area in Puebla.

Working at the macro-scale and the local scale, the research provides, along with knowledge on community-based best practices, opportunities for interaction and negotiation between actors to increase resilience and reduce vulnerability.
Participatory mapping in Puebla, Mexico.
This project examines how Rwanda’s urbanisation vision emerges from a developmentalist-eurocentric way of ‘seeing’ the natural environment as an economic resource; an intolerant vision that contributes to ethnicity-based conflict.

In collaboration with hunter-gather communities, evicted from Rwanda’s forests, participatory action research methods are explored as set of design tolerances, in which non-western knowledges emerge to produce alternative visions that co-exist with the Rwandan landscape.

This research views the socio-natural politics of Rwanda’s urbanisation through the design-lens of ‘Vision 2020’. Vision 2020 aims to ‘develop’ Rwanda’s dominantly land-dependant society through the economic-urbanization of its natural environment. Development is coupled to the states collectivization of informal settlements and farming land, dehumanizing socio-natures that are redesigned as tourism, collective agriculture, renewable energy and conservation.

New boundaries drawn between human settlement and the landscape, occur simultaneously across Rwanda’s spaces and scales of the city, village and remaining ‘primary’ forests.

Rwanda is the geographically smallest, most densely populated country in sub-Saharan Africa yet the least urbanized. The majority of Rwanda’s population rely access to land for food, income and wellbeing. Where Rwanda’s genocide is often historicized as tribal, its conflicts are simplified and made singular. Rather Rwanda’s conflicts are numerous and deeply rooted to Eurocentric and ethnocentric claims to the landscape, with racial and environmental intolerances designed into its built-environment.

This research examines the conflicts behind Rwanda’s Vision 2020 reconstruction narrative through two questions. Firstly, how do western-colonial ideologies of race and the natural environment spatially and aesthetically inform Rwanda’s re-development? Secondly how might architectural practices begin to resist Developmentalism gaze, where a western model of society is seen as the ideal image and in which the non-western world is reconstructed?

This second section is explored through architectural conventions of surveying, model-making and cartography. Conventions re-appropriated by and through collaborations with a landless forest community allowing alternative, extreme visions of the dwelling as landscape to emerge.
Related publications:

Making Cultural Commons: A Global South Perspective

This project, funded twice (2018, 2019) by ECA Research, Knowledge and Exchange, looks at a network of cultural producers and grassroots art spaces in Medellin, Colombia focusing on their creation of cultural values in the city.

The project stems from the project Medellin Urban Innovation: Harnessing Innovation in City Development for Social Equity and Wellbeing (2015-17) funded by the Newton Institutional Links Grant from the British Council and led by University of Edinburgh in partnership with Heriot-Watt University, UK.

Due to the still complex post-conflict era in Medellin, heritage and cultural values are linked to historic artefacts that represent grand narratives of national (post-colonial) history whereas local grassroots art practices have been overlooked. The latter makes art collectives and cultural producers, as the ones that this study focuses on, to work almost in the periphery of cultural production in Medellin, something that indeed creates barriers to constructive dialogue and/or synergy with public art institutions in the city.

Following this line of argument, this project engages with the members of the network-under-research to co-design a methodological toolkit that can a) look at, reflect and evaluate their network and b) become a tool for the network to communicate their practice and production of cultural values to public art institutions in Medellin.

In June 2018, a series of workshops with grassroots art collectives was organized to re-define ‘intangible cultural heritage’ as a ‘cultural commons’ where cultural values are co-created, shared between groups and communities, support openness, collaboration and peer learning and thus become a common good.

In June 2019, I organized together with the independent art organization, Platohedro, a two-day symposium with public art institutions and academics to discuss further emerging intangible cultural heritage in Medellin. The key research question that this stage of the ethnographic fieldwork focused upon is as follows:

How do we translate our practices of creating cultural values in a common language understood by public art institutions, local authorities and the academic scholarship?

The two main objectives of the above research question are:

a) to unpack the discussion on the making of intangible cultural heritage in Medellin by sharing best practice as produced within emerging art collectives and local communities;
b) to transform cultural heritage institutions by decolonising the processes of cultural production, curation and archiving.

There are two co-authored reports on both series of workshops in 2018 and 2019 that reflect the methodology we used as well as the key findings of the research.

In 2020, I have started a new collaboration with Platohedro to expand our research to cultural commons as defined and experienced in Africa.

We have set up a network with academic researchers, artists and art institutions from Senegal, Congo, Uganda and South Africa. The project is partly funded by DOEN Foundation (Netherlands) to cover the research and travel costs.

Due to Covid-19 travel restrictions, the first stage of the project (March – December 2020) has taken a hybrid format (online network meetings, collaborative online work, desk-based/archival research and in-situ locally-based research).

**Related outputs:**


Media Coverage:

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https://luc-athens.org/cultural-commons-how-do-we-put-it-into-practice-in-medellin/
Order and Disorder is a joint-author research and publication project which will result in a significant monograph to be published in 2021 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.
SALONE DRIFT (FILM)

A feature-length research documentary that chronicles the ruinous consequences of informal sand and rock mining in Freetown, Sierra Leone – and unearths its connection to the divided legacy of the city’s colonial past.

Salone Drift is a documentary that charts informal illegal sand and rock mining in Freetown, Sierra Leone, tracing its ruinous consequences to a legacy of colonial inequality. A British crown colony until the 1960s, Freetown was an urban laboratory for western experimentation. Concerns around malaria produced health segregation that reshaped the city, with the establishment of Hill Station in the 1930s, a supposedly disease-free enclave for the colonial authorities high above Freetown’s infected city. That uneven topography continues: Hill Station remains a site of prosperity, home to the development of luxury villas.

This construction boom consumes sand and rock from unregulated sources, impacting on the city below. Salone Drift uncovers the informal processes of extraction that increasing flooding and soil erosion, undermine living conditions for Freetown’s urban poor. In doing so, the film surveys the uneven strata of race, class, and health; injustices hidden beneath urbanisms of the Global South today.

Related publications:

Day-labourers, 2013, Freetown, Sierra Leone. Photo Killian Doherty.
THE INTERSECTION OF RURAL-URBAN AREAS IN MEDELLIN, COLOMBIA

Exploring the development and implementation of co-produced water management infrastructure solutions to adapt to climate change-related risk.

Identifying and testing co-produced water management infrastructure solutions at the intersection of technical, social and environmental knowledge to reduce environmental risks and adapt to climate change-related risks. Increasing urbanisation along the edge of Medellin, characterised by informal growth influenced by (internal) conflict – and environmentally-based displacement, has produced vulnerable peri-urban areas that are exposed to risks, increasing with climate change.

Understanding ‘habitat’ as ‘socially constructed’, where each individual’s input forms the collective ‘state of being’ within which they live (Latour 2005), this project aims to develop transdisciplinary knowledge and build capacity for policy implementation, through identifying and testing water management infrastructure solutions that are at the intersection of technical, social and environmental knowledge, to reduce environmental risks.

This proposal’s innovative approach is rooted in the co-production of infrastructure solutions through climate-change participatory methodologies that engage local community knowledge, technical appraisals and institutional policy design and implementation.

This will include identifying and scoping joint decision-making between communities and government agencies around neighbourhood planning in the rural-urban edge, aimed at reducing structural inequalities and risk, increasing social equity and wellbeing.

CHAPTER 04 / GLOBAL CITIES, SPATIAL PLANNING AND PLACE

BY: Soledad Garcia-Ferrari
University of Edinburgh

WITH: Kathi Kaesehage
Stephanie Crane
University of Edinburgh
Elizabeth Arboleda Guzman
Edier Aristizabal
Wilmar Castro
Universidad Nacional de Colombia
Guillermo Antonio Correa Montoya
Paula Andrea Vargas Lopez
Any Lady Zapata Berrio
Claudia Marcela Aldana Ramirez
María Alejandra Villada Ríos
Universidad de Antioquia
Local Government & local NGOs

FUNDING: £299,533.48 British Academy – Urban Infrastructures of Well-Being 2019

YEAR: 2020 – 2022
Peri-urban area in Comuna 8, Medellín, Colombia.
UNDERSTANDING ENERGY RESOURCE SYSTEMS, ENVIRONMENT AND PEOPLE IN GALÁPAGOS, ECUADOR

Towards a net-zero carbon footprint by 2040.

The Galapagos 2040 Vision is based on a collaboration between the University of Edinburgh, the Government of Galapagos, the Charles Darwin Foundation and the UK-Ecuadorian Chamber of Commerce. Meetings in 2018 and 2019 with representatives of Ecuadorian government institutions, including the Minister of the Galápagos region, led to an initial agreement for a programme of work with the University of Edinburgh on the theme of ‘Sustainable Energy, Environment and Communities’ in the Galápagos, in the context of Ecuador’s goal of achieving a net-zero carbon footprint in the Galápagos Islands by 2040.

Achieving this goal will ensure sustainable development for local people and the local economy, requiring an in-depth understanding of the unique and sensitive ecosystem and local context.

Through a local policy review, a knowledge exchange event, and the creation of a local ‘Innovation Hub’, this project aims to explore the challenges, drivers and solutions for achieving equitable access to water, food and energy resources in the region.

We aim to understand the political, regulatory, social, economic and environmental context of the Galápagos Islands for the supply, access and security of water, food and energy resources, drawing on current discourses of policy and practice, successes and failures, and local capacity for change. We will then share local, national and international examples of best practice at a virtual interdisciplinary symposium to be held in May 2021, engaging a range of stakeholders, such as representatives from the local and national government, academic institutions, private sector organisations and NGOs. An ‘Innovation Hub’ will be created in Puerto Ayora to bring together public, private, academic and non-profit stakeholders and act as a local driver for the 2040 Vision.
CHAPTER 05

History and Heritage
ARTS BUILDINGS IN BRITAIN, 1900–2000

Looking at Arts buildings in Britain in order to shed light on architectural, social, and urban histories.

Between the 1950s and the early 1990s, a wave of building led to the construction of often substantial new theatres and concert halls 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 Moro – 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. The book – republished in paperback in 2020 – was shortlisted for the Theatre Book Prize 2019 and the Society of Architectural Historians of Great Britain’s prestigious Alice Davis Hitchcock Medallion in 2019. It has been cited in several recent heritage protection decisions.

Current work is extending the analysis back to the year 1900, and will inform an invited book chapter on British theatre architecture between c. 1900 and c. 1950.

Related outputs:

BY: Alistair Fair
University of Edinburgh

FUNDING: Royal Society of Edinburgh, Carnegie Trust for the Universities of Scotland

YEAR: 2013 – 2020
Eden Court Theatre, Inverness (1976)
Photo: A. Fair.
This project presents evidence for a new narrative in British planning history, one that embeds the digital computer in one of the most critical and high-stakes debates of the late postwar period: how to achieve efficient and equitable town and country planning amidst rapid industrialization and urbanization.

This project examines technology and politics in the evolution of the British planning system, and traces the mechanization of land use planning work from the Second World War to the late 1980s. It joins previous studies on the social and political history of computing in Great Britain, identifying the role of digital technology in knowledge- and cultural production during the reconstruction of physical, social and intellectual landscapes after 1945. Specifically, it analyzes the process by which civil servants in England and Scotland – employed by the CEGB, the National Coal Board, the British Gas Corporation, and the South of Scotland Electricity Board – reduced visual landscape scenery into a quantifiable resource, and how they computerized and deployed this new “currency” according to the interests of their employers.

This happened because civil servants began to exploit the general characteristics of mainframe computers (speed, accuracy, replicability, and economy) to define new ways of representing and measuring visual phenomena, and of comparing alternative visions of the countryside, using quantitative “facts” rather than visual images. The result was an early form of computer vision that measured and quantified rather than depicted landscape, a technology used to profoundly transform not only visualization, representation and management practices, but that also helped to justify continued industrial expansion.

An article is currently under review; the eventual aim is an 80,000-word book.

**Related publications:**
BUILDING A REGIONAL MODERNISM:  
ART NOUVEAU ARCHITECTURE IN NANCY,  
1895–1914

A major study of the Art Nouveau architecture of Nancy, and the first in English, which demonstrates how architects in Nancy used the style to create an enduring ‘regional modernism’ that served as an emblem of the resurgent vitality of eastern France in the decades following the disastrous Franco-Prussian War.

Over the last two decades of the belle époque, the city of Nancy in eastern France experienced an unprecedented era of economic growth, urban expansion, and building activity. A bevy of progressive and talented artists, architects and industrialists seized on the opportunity to effect a renaissance in the decorative arts, architecture and design, using the style of Art Nouveau as a regional emblem. They attempted to direct attention in the rest of France to a decidedly regionalist agenda, opposed to the Parisian requisitioning of human and material resources from the provinces for its own benefit and especially the recapture of the of Alsace-Lorraine, annexed by Germany following the disastrous 1870–71 Franco-Prussian War.

Nancy’s architects of this generation were the first to be trained professionally en masse at the Ecole des Beaux-Arts in Paris, and they used their skills and talents to reshape the cityscape, constructing new residential, commercial, industrial, and institutional structures for the city’s growing number of leaders in business and industry, many of whom had arrived from the ‘lost provinces’ in the aftermath of the Franco-Prussian War. They were assisted by the city’s cadre of decorative artists in the regional association of artists, designers, and industrialists founded by Emile Gallé in 1901 called the Ecole de Nancy, turning their Art Nouveau structures into total works of art that showcased the wealth and high level of industrialized craftsmanship that helped in many ways distinguish their strand of Art Nouveau from that of Paris. Their commitment to an artistic modernism that resonated with an enthusiastic regional audience allowed Art Nouveau to survive in Nancy for an astonishing two full decades, longer than almost anywhere else in Europe.

The project has produced numerous conference papers and journal articles. The principal output is a monograph of approximately 150,000 words, due to be submitted to Yale University Press in 2020.
Related publications:

www.19thc-artworldwide.org


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 neoclassical 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.
Belfast City Hall (1906): Alfred Brunswell Thomas. Photo: Alex Bremner.
This project is examining relationships between ideas of ‘community’, citizenship, and architecture/planning in Britain between the Second World War and the end of the 1980s.

This project is exploring concepts of community, privacy, and citizenship, and their relationship with architecture and planning in Britain between the mid-1940s and the late 1980s, i.e. from the creation of the post-war Welfare State to the beginnings of its neoliberal reformation.

When building work began on the Woodchurch estate in Birkenhead in 1946, a plaque stated that the area would ‘on completion... contain the houses and other buildings necessary to sustain the fully developed life of a community of some 10,000 persons.’ The idea that architecture and planning might productively encourage the formation of communities was commonly held by policymakers and designers alike in the years around the Second World War.

The Woodchurch plaque foregrounded this idea, and, in its reference to ‘houses and other buildings’, also demonstrated the extent to which ‘community’ was bound up, on the one hand, with communal activities (in such buildings as churches or community centres) and, on the other, with domesticity and the family. It would be encouraged by the provision of these buildings, and the (public) spaces between them.

The plaque’s mention of ‘fully developed life’ is also important. ‘Development of personality’ was an oft-cited contemporary ideal. For example, when in 1945-46 a government committee examined the desirability of building new towns, it concluded that ‘in a true community, everybody feels, directly or through some group, that he has a place and a part, belonging and counting.’ Otherwise, people ‘cannot put down roots nor become conscious of responsibility for a place’. As its use of the word ‘responsibility’ reveals, the committee’s ideal was that new-town residents would not be passive. In Parliament, the Minister for Town and Country Planning, Lewis Silkin, suggested that these towns could create ‘a new type of citizen, a healthy, self-respecting, dignified person with a sense of beauty, structure, and civic pride’.

How, then, were community, privacy and citizenship understood by planners, architects, policymakers and residents in post-war Britain? How and why did these ideas change? How much agency did individuals have, and what roles did gender and ethnicity play? What impact did these ideas have on housing design and layout, town plans and facilities?
How were community and citizenship embodied in the conception and design of public buildings (e.g. libraries, civic centres) and public art? These questions are at the heart of the research, which focuses on a range of case study locations. Their answers will start to offer new ways of thinking about post-war architecture more generally, and will lead to a bigger project examining post-war Scotland and Britain.

Initial outputs for 2020-21 are projected to include an article on privacy and courtyard housing in 1960s Scotland. Archive work in 2021 (postponed from 2020) will lead to further publications. This work complements Alistair Fair’s forthcoming Leverhulme-funded project (a collaboration with Miles Glendinning at ECA, and Lynn Abrams at the University of Glasgow) on Scottish new towns since 1945.
Scottish landscape history remains a relatively unexplored field of study, particularly the very fertile period around 1700.

The formal lines of many landscapes are still traceable on 19th-century maps. General Roy’s 1748-1755 map of Scotland provides invaluable information but until its foolscap sheets were assembled digitally it was almost impossible to study the extending lines (some up to seven miles) of these large-scale landscapes.

The map can now be viewed side-by-side with satellite images on the National Library of Scotland’s Maps website. Comparative examination of these map sources with the later Ordnance Survey series revealed that 180 formal landscapes, with a minimum length of one mile, were created in Scotland between c.1700 and the 1730s.

The design of Edinburgh’s New Town in the 1760s has been attributed, solely on stylistic grounds, to the towns of Richelieu, to Nantes, and even to Lisbon.

In the late 1720s the Earl of Mar produced a design that had no bearing on any of these towns but which was related to the Scottish style of landscaping described above. The original Proposal of 1766 for the New Town included Mar’s suggestion for a grid plan bounded on the north and south by French-style panorama terraces. The Proposal specifically refers to Turin for its big residential blocks, and to Berlin for its gardens within the new districts as suitable models for the New Town. These overlooked suggestions do indeed appear to have been more influential on Edinburgh’s design than the stylistic sources that are usually cited.

Related publications:
Margaret Stewart, ‘Scotland’s Formal Landscapes Surveyed on General Roy’s Military Map of Scotland’, Landscape History, 39:2, 43-70’.

HELENES

A feature documentary film about architectural reconstruction in Edinburgh and Athens in the early nineteenth century.

Based on original documents, paintings, architectural designs and set in Athens and Edinburgh in the early nineteenth century, this film examines the controversial acquisition of antiquities, tensions between antiquity and modernity in designing modern Athens, and the romantic quest for the authentic that dominated European cultural and architectural values.

James Skene of Rubislaw with Sir Walter Scott had been instrumental in the construction of important Neo-Greek civic buildings and the acquisition of casts of the Parthenon sculptures (now in Edinburgh College of Art) in the 1830s.

In 1843 Skene arrived in Athens and remained there for seven years. He was shocked to find the Parthenon temple horribly damaged by the removal of its sculptures by his friend Lord Elgin.

Skene was welcomed in Athens – he was with, the Greek’s hero of the War of Independence, Lord Byron a native of Aberdeen. Skene tours Greece recording 500 ancient sites in watercolour paintings (now in the Benaki Museum) and these will feature in the film.

In the film Skene visits the studios in Athens of the Danish, Greek and German architects laying out the new city and public buildings – we view their plans and Skene compares them to Hamilton’s and Playfair’s designs for Edinburgh. This rational task is juxtaposed with the Romantic quest for an authentic architectural past reborn in the modern world, articulated through the highly romanticised hallucinatory visions of the artists and architects of the period.

Related publications:

Thomas Hamilton, Burns Monument, Calton Hill, Edinburgh (1831). Photo Margaret Stewart.
The focus of the books 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:

Per Kleiva, American Butterflies, 1977
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:


LEGACIES OF EMPIRE IN SCOTLAND’S BUILT ENVIRONMENT

A two year Royal Society of Edinburgh networking partnership between the University of Edinburgh, Historic Environment Scotland, and the Coalition for Racial Equality and Rights (CRER).

John Lowrey (PI) and Dr Kirsten Carter McKee (Project Manager) have an RSE Networking grant to develop a research network investigating connections between Scotland’s historic built environment and the British Empire, especially the transatlantic slave trade. The project is a collaboration between ESALA, Historic Environment Scotland and the Coalition for Racial Equality and Rights.

The direct and indirect benefits of the slave trade to Scottish individuals, institutions and the economic development of the country more generally in the eighteenth and nineteenth centuries has been the subject of much recent research but less attention has so far been paid to the resonance of that within the built environment, notwithstanding some recent public interest in this area.

The aim of this project is partly to explore this aspect of Scottish architectural history but, more importantly, to consider how we currently manage that architectural heritage and how we should reveal and interpret this aspect of our history.

The project is structured around a number of networking events and workshops, leading to a conference in 2022, which is intended to provide a platform to develop further and more detailed research in the future.

The activities have been modified in response to the Covid-19 pandemic and one output of that is the website Managing Imperial Legacies, which will provide a record of the project as it progresses.

Website: https://www.managingimperiallegacies.com/
A study of Le Corbusier’s early post-World War II career, focusing on his involvement with the French Reconstruction and last attempts to implement his full urban visions as developed during the 1920s–40s, situating him in the context of larger French discussions of the future of modern architecture in the wake of the demise of Vichy and the attempts to fashion a new republican postwar society.

Having been spurned by Philippe Pétain’s Vichy regime after offering his services to it in 1940, in 1945 Le Corbusier sought to obtain three commissions from the French Ministry of Reconstruction for new building projects after the war: the now-famous Unité d’Habitation in Marseilles, the reconstruction of the cities of La Rochelle-La Pallice on the Atlantic coast, and a reconstruction plan for the devastated city of Saint-Dié-des-Vosges in eastern France. This project analyses the history of these three projects in greater detail, arguing for their importance as the fullest practical expression of Le Corbusier’s urbanism as developed over the previous quarter-century. Ultimately, the only project of the three that Le Corbusier would realize was the Unité d’Habitation, which was itself an incomplete portion of a much larger urban vision that would have been fully expressed at either La Rochelle or Saint-Dié had he been able to implement either plan. The project traces the history of Le Corbusier’s involvement in each of these three sites; eventually he was forced to resign as architect-in-chief at La Rochelle after his plans for a high modernist housing scheme met with massive public outcry, while similar public dissent derailed his attempts to hijack the project at Saint-Dié from the official reconstruction architects there.

In a broader sense, this study considers the uneasiness with which modern architecture was greeted in France after the Second World War in general, focusing on the reasons for opposition to Le Corbusier’s plans, including a nostalgic conservatism, entrenched cultural regionalism, and a strong national desire for consensus-building that did not appear too extreme, all of which can be linked to the appeal of the Pétain’s Vichy regime and which demonstrates the legacy of such entrenched traditions in an era of architectural history often cited for its ruptures from the past and embrace of modernism.
The principal output of this project is slated to be a monograph of ca. 100,000 words, but numerous conference papers and two journal articles have already appeared. It has also spurred numerous focused explorations into tangential areas of interest, such as the development of French regionalism during the first half of the twentieth century.


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’.

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 overriding 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.

The book firmly integrates the architectural and city-planning practices of Modernism with the key contextual factors shaping housing production, such as politico-cultural 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.

Related outputs:
A new methodological model for the environmental history of early modern architecture.

Nature and Imitation in Early Modern Architecture is the first monograph to explore architecture’s role in the formation of modern concepts of nature. It argues that new encounters between the natural sciences and architecture between the fifteenth and the eighteenth centuries established concepts of human agency in nature that underpin our own troubled Anthropocene.

Since Augustan-era architect Vitruvius wrote his treatise De architectura, European architects variously promoted and transgressed the Classical dictum that art, and, by extension, architecture, should imitate nature. However, it was first with the late fifteenth-century advent of scientific literature based on empirical investigations that there emerged nuanced narratives about how architecture should emulate nature.

Research on the imitation of nature in early modern architecture has thus far focused on the natural forms represented in building and architectural treatises, but has not asked how architecture’s encounters with the natural world might have formed modern notions of nature as such.

Nature and Imitation will probe the ways early modern architects – steeped in emerging geological, botanical, zoological, and anatomical sciences – wielded new scientific practices to simulate, conquer, and replace nature with a manmade landscape of naturalistic forms. By revealing the ways in which naturalism in early modern architecture formed modern beliefs about how humanity shapes nature, Nature and Imitation will enrich vital conversations in the history of art, science, and the environment. It will show how early modern architects’ efforts to eclipse nature helped define the regimes of power that undergird global environmental and social conditions, thereby casting our current environmental crisis in starker relief.

Related publications:


Peter Moro was a German-born architect who, after studying in Germany and Switzerland, came to Britain in the mid-1930s.

He worked initially with Berthold Lubetkin’s famous practice, Tecton, before collaborating with Richard Llewelyn-Davies at the end of the 1930s on the design of an acclaimed house in Sussex. Following internment at the start of the Second World War, he developed a career as a respected educator and designer of exhibitions, before in 1948 joining the team designing the Royal Festival Hall. Here, working alongside Robert Matthew, Leslie Martin, and the architects of the London County Council, Moro played a key role designing the interiors of the hall.

Moro set up his own practice in 1952. His experience with the Festival Hall meant that he was regarded as a specialist in the design of Arts buildings, and several theatres followed, notably Nottingham Playhouse (1963) and Plymouth Theatre Royal (1982). However, his practice was also responsible for schools and housing, as well as a small number of commercial projects.

These projects have remained almost entirely unstudied. Moro’s practice comprised a small, close-knit team, and its work was highly regarded for its architectural integrity and ingenious planning. Like Lubetkin, Moro was convinced that architecture should be a contemporary art, not merely a matter of function; at the same time, he was a committed Modernist, and remained so even as some of his contemporaries started to doubt the Modernist project during the 1970s and 1980s.

Moro’s work sheds useful light on British architecture in the years between the 1930s and the 1980s, challenging the idea of a break caused by the Second World War and showing how a commitment to good design and the ideals of an evolving Welfare State could generate architecture of real quality.

The key output from this project will be a book for Liverpool University Press, due to be published in 2021 to mark the seventieth anniversary of the completion of the Festival Hall.
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 patterns. 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’.*
Steel buildings have encapsulated most aspects of Modernist culture.

From the positive, aspirational visions of an exciting and rewarding lifestyle, expressed architecturally in pristine metal-and-glass buildings, to the negative realities of the Modernist industrial-capitalist complex: monotonous, de-humanising buildings and townscapes that lead to alienation; excessive wealth inequality that weakens the fabric of society; and over-consumption of resources that is a major cause of pollution, biodiversity loss and climate breakdown on a planetary scale.

At the beginning of the Modern period, steel-framed buildings were prominent in the quest by architects for new forms of visual expression. The dematerialisation of form and open-planning of Mies van der Rohe’s Barcelona Pavilion of 1929 captured something of the new cosmology of the post-Einstein universe; the Glass and Farnsworth houses of the 1950s presented a vision of an appropriate domestic environment for the truly Modern individual; the Eames (1949) and Stahl (1960) houses envisaged a closer relationship between humans and the industrial hinterland of Modernity through the use of mass-produced components in an unmodified state; the Centre Pompidou (1978) explored how the resources of major industries could be used to create a Modern temple of culture that was democratically accessible; and the skyscraper speaks clearly of a world of wealth accumulation, inequality, and globalised corporate governance.

Steel architecture has, throughout its history, projected its message without irony, and recently, in denial of its global environmental consequences, the latter position being most clearly demonstrated in such buildings as the CCTV headquarters in Beijing (2009), and in claims like that made for the Bloomberg European headquarters in London (2017): that it represents a vision of the office of the future. The current project re-appraises the role of steel architecture in creating a built environment that is both a response to and an expression of the Modern condition.

Related publications:
Steel Architecture: A barometer of the Modern Condition, to be published by The Crowood Press, early 2021 (currently in publication).

Glass House, New Canaan, Connecticut, 1949; Philip Johnson, architect; photo: Staib/ Wikimedia Commons.
THE EDIFICE UNDONE: ART, ARCHITECTURE, AND SCIENTIFIC PRACTICES IN WENDEL DIETTERLIN’S RENAISSANCE

The first major study of artistic and scientific practices in sixteenth-century architectural culture north of the Alps.

*The Edifice Undone* probes how the appropriation of artists’ scientific practices to the canon of architectural knowledge made architecture a catalyst for the rise of modern, empirical thought. The book’s central evidence is the 1593–1598 *Architectura* treatise of Straßburg artist Wendel Dietterlin the Elder (c. 1550-1599).

It was Dietterlin and his peers who dismantled the old regime of premodern architectural culture in northern Europe: the notion of architectural knowledge as synonymous with expertise in realizing buildings. Bookended by the careers of painter-architects Albrecht Dürer (1471–1528) and Pieter Paul Rubens (1577–1640), Dietterlin’s era saw the rise of a new concept of architectural practice in which devising images and objects came to rival the creation of buildings as goals of architectural design, and in which artistic practices of observation and description shared with the emerging new sciences thus came to play more important roles in architecture.

Dietterlin’s *Architectura* synthesized diverse strands of artistic and scientific knowledge in the architectural culture of northern Europe, reconfiguring the relationships between experience and architectural expertise. His work had sweeping implications for architecture’s ancient links to mathematics, philosophy, and the natural sciences.

This book argues that the diversity of artisanal expertise distilled in northern architectural culture through Dietterlin’s *Architectura* and peer works made architecture a prime agent of empirical practices at the dawn of the new sciences. In redefining architecture’s relationships to the practices of other arts and sciences, Dietterlin’s *Architectura* helped to invent what is now called interdisciplinarity: the idea that experience in one field of human inquiry can form expertise in other realms of knowledge. By examining Dietterlin’s intervention, *The Edifice Undone* offers a new model for examining architecture’s agency within the histories of art and science.

Related publications:

Petcu, E., ‘Vasari in Renaissance Straßburg’, *Journal of the Warburg and Courtauld Institutes* LXXXII (December 2019 issue), 351-82

By: Elizabeth J. Petcu
University of Edinburgh
Year: 2015 – 2020
The Remarkable Transformation of San Pedro

The Uruguayan engineer Eladio Dieste (1917–2000) is unquestionably one of the greatest structural engineers of the 20th century.

His work sits alongside that of Felix Candela, Robert Maillart, and Pier Luigi Nervi amongst others. Their work is characterised by innovations in materials, structural form and construction practice. Many of their projects have long been recognised as important architectural works, intentionally expressing structure with elegance derived economy and efficiency. Dieste’s work encapsulates such ambition, however in addition, throughout his career sought to ensure that his work was appropriate to the economic, cultural and social needs of Uruguay, to develop an approach to design that did not rely on systems and solutions from the developed world.

‘I believe that we must contemplate each problem independently, keeping in mind the conditions of our circumstances and environment.’

This is most clearly demonstrated in Dieste’s reinterpretation of brick in new and innovative forms that challenged the predominance of concrete used by his contemporaries in architecture and structure.

The project marks a return to Uruguay to study further one particular building, the Church of San Pedro in Durazno. Dieste designed and constructed a number of churches, most notably the Church of Cristo Obrero in Atlantida that remains his most widely known and emblematic. San Pedro with its flat surface plane is atypical, a departure from the use of the doubly curved surfaces that ‘resist through form’.

In 1967, the church was badly damaged during after a major fire in the roof space. Dieste, with his company Dieste y Montañez undertook both the redesign and construction.

The original church, which dates back to the late 19th century, was in a conventional basilical style and is the predominant building on Plaza Independencia, the main public square in the town.

Dieste’s design went far beyond the simple reinstatement of the roof to a complete remodelling of the nave, side aisle, chancel and altar, replacing the roof, the vaulted ceiling, nave wall, the arched colonnade and side aisle with a minimalist arrangement of flat brick surfaces that sought to democratise the central space in line with the ideas informing Vatican II.

The result is remarkable in creating a truly spiritual space without the conventional iconography associated with traditional catholic churches. The expression of the structure itself is suppressed, yet the design relies on technically sophisticated structural engineering and careful construction and detailing.
The project involves further archival research, with previously unpublished images of the church, new material input from Dieste’s surviving collaborators, physical experiment and modelling of material and structure.

The budget for the reconstruction in 1970 was USD $27,000, in itself remarkable.

Reference:
CHAPTER 06

Culture and Theory
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.

Having spent a month in Bangkok, Mark Cousins completed 31 drawings (one for each day in January 2017) and took some 1,800 photographs. The drawings employ pencil, pen and crayon and endeavour to capture something of the small scale dynamism which the city authorities seem determined to expunge (see article in *The Guardian*, dated 18th April 2017).

Related output:
A new cross-European research network on the study of 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.

In 2019-20, the Working Group 1 organised a one-day conference on ‘Ethnographies of Collaborative Economi(es)’ held in Edinburgh College of Art (25 October 2019). The conference proceedings are published online. There will be an edited book on the conference theme in 2021. I am also contributing to individual co-authored papers and chapters on the ACTION theme of collaborative economy.
Related publications:


International Conference:

https://ethnocol2019.wordpress.com/

Website:
http://sharingandcaring.eu/
DECOLONIZING INFRASTRUCTURES: MAKING ARCHITECTURE IN AN ECOLOGICAL ERA

In the radical process of putting the broken world together, infrastructure architecture as an interdisciplinary and transdisciplinary practice takes shape through the process of decolonization and comes to re-exist beyond colonial logic and the Western canon and epistemology.

In the ecological turn in architecture practices, thinking of ecology draws our attention to its etymology; eco means home. But the question is ‘what home is supposed to be, especially where home is eradicated, wiped out, deforested, subsumed or flooded’ (Frichot, 2016). This research aims to expand architecture as decolonizing infrastructures and support structures by situating it in contested ecologies and troubled sites that are complicated by the forces of labour, migration, colonization and exploitation of natural resources. These troubled sites are eradicated, occupied, destroyed homes, where (dehumanized) human and non-human inhabitants are subjugated, ignored and silenced by the ‘human-centred’ project of ‘development’ and ‘progress’.

It is in this context that infrastructure architecture comes to act as a practice that departs from the question of ‘how the world is breaking down’ to ‘how the world gets put back together’ (Mattern, 2018).

To expand how decolonizing infrastructures take shape, the project follows Walter D Mignolo’s work on decolonization as the processes of ‘de-linking’ from coloniality and ‘re-existing’ beyond colonial logic. It looks at colonization through the extraction of natural resources and takes its current case studies from ecologies shaped by oil extraction in an Iranian context, where the contestation between colonial Western powers and the local states over petroleum resources has left in its wake environmental degradation, political crisis, wars and conflicts, refugee crisis, dictatorship, and the rise of extremism and far-right politics.

Related outputs:
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.

Developing out of a background within which theories of the earth, natural history, speculative fiction and military-industrial advancement are closely entwined, far-futures thinking developed through the Cold War era as a complex arena in which geopolitical antagonism, competing ideologies, and technological progress met with military strategy, emergent discourses of risk, and assorted visions of the society-to-come. Importantly, the deep future is a condition that extends beyond any verifiable empirical calculation – and so it is often figured as taking place on the other side of some catastrophic occurrence that marks the threshold of knowability.

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:

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 plenitude 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 double-blind peer-reviewed publication, with a growing pool of international scholars as reviewers. Each issue draws on a specific subject, situation, theme or idea. This may include issues linked to particular events, exhibitions or conferences.

In 2019, Drawing On published its third issue, documenting a collaboration between Drawing On and peers at the University of Technology, Sydney (UTS). This issue included selected papers from the first Australasian Architectural Design Research conference, held at the University of Sydney School of Architecture, Design and Planning in September 2018. It forms a record and survey of Research-By-Design work currently being undertaken in the Australasian context.

A call for submissions to a fourth issue of the journal, Drawing On: Re-Appropriation and Representation, launched in July 2020, in collaboration with the PhD Architecture by Design community at the University of Edinburgh.

Related outputs:


Website:
www.drawingon.org
This project contributes to an understanding of how digital platforms, and the attendant digital labour these platforms require, shape local urban and economic space.

By exploring, visualising, and mapping these navigations, this project uses unique data to illustrate how on-demand food couriers create, modify, and reproduce social space in the city. We suggest that forms of urban platform hacking, when coupled with qualitative work, constitute a powerful instrument to challenge top-down urban narratives that foreground the integrated, optimised flow of resources and labour as a hegemonic vector in the city.

Related publication:

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:

A theoretical and methodological reappraisal of potentiality – understood broadly as the ability of materials to change – in architecture and design.

The project re-thinks the still-prevailing modern paradigm of design practice: the technical tabula rasa, a tendency to begin from scratch and use raw, amorphous and compliant materials that can be easily and effectively manipulated, facilitating a seamless and faithful embodiment of intentions.

This predominant modus operandi is grounded in the hylomorphic philosophy of Aristotle, which associates matter with potentiality and form with actuality, thus foreclosing the ability of formed / individuated objects to change. A theoretical framework is developed to neutralise such a view and, more generally, understand how design and manufacturing processes generate and maintain potentials in space and time.

While the central resulting concept – ‘ecology of inception (EoI – accounts for the equipmental enclosures within which networks of tools are inscribed and called to perform specific tasks, it is also responsible for setting the criteria whereby objects will become obsolete. Here, through the notion of ‘ecology of suspension (EoS)’ and the philosophies of Giorgio Agamben and Graham Harman, the text proposes an alternative mode of ‘deep’ material valorisation that is affirmed in excess of use values, functional scripts, relationality and molecular obedience, and in defiance of established quantification and justification protocols.

The project introduces an exaptive paradigm for design that, inspired by (and building upon) evolutionary biology, hacking, adaptive reuse, and improvisational practices such as collage, adhocism, bricolage, kit-bashing and jazz, refuses to reduce pre-existing material substrates to abstract lists of properties or featureless lumps, encountering them on their own terms – as situated individuals and co-authors.
Key related publications:


Exhibitions:
Sparks of Life: Frankenstein and regeneration at Carliol House, Newcastle-upon-Tyne, Being Human Festival: Lost and Found (November 2017).

Self-Built Utopias, Northern Stage, Newcastle-upon-Tyne, Great Exhibition of the North (June – September 2018).
Extended everyday discourse is either cause or symptom of Amartya Sen’s *The Argumentative Indian*; he says, “Prolixity is not alien to us in India. We are able to talk at some length... We do like to speak.”

Sen sees this tendency towards loquacity as the basis of “democracy as public reasoning.” This is the same “heterodox” communicative principle that we suggest lies at the heart of what can be called Indian modernity, a humanism that is environmental and intersubjective in character rather than anthropocentric and objective. Modernity, as the OED tells us, is “an intellectual tendency or social perspective characterized by departure from or repudiation of traditional ideas, doctrines, and cultural values in favour of contemporary or radical values and beliefs.” Our research tells us this is only partly right. We suggest that Indian Modernity gives us a different impetus altogether. Indian modernity proposes being in the moment over either glorification or repudiation of a past.

It sees history as a continuity, neither in progress nor decline. It pursues a critical optimism of what it is like to be in India, living for the moment, looking to futurity but not ignorant of the past. Modernity, thus, is evident in many periods. India’s heritage cares about who inherits what from whom and that it is invested wisely, economically and culturally. Our research suggests that these tendencies can be framed ecosophically, cosmopolitically. Therefore, the most important moment of modernity is the relevance of the futurity of a then as it intersects with a newly relevant now, and for us as architects, in a predictive adequation of futurity.

Our methods are therefore as speculative as analytical, as predictive as theoretical, but always invested in an optimism and wisdom found both cosmo-logically and cosmo-politically in India.

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2 Ibid. pp12–16.
Key related publications:


How do infrastructures and their architectural support systems hold us up? How do they fail us?

Can we imagine architectural infrastructures from novel points of view, both human and non-human? Where can we, as critical and creative designers, intervene to support more inclusive, humorous, adventurous and sheltering infrastructures?

This anthology is dedicated to infrastructural love. We focus our collective attention on the distributed architectural support systems that are associated with local and global infrastructures, both material and virtual. Usually, we apprehend the existing infrastructures only at the moment of their failure. Love here suggests the importance of disposition when it comes to infrastructures; that is, how we are orientated toward infrastructures, how we build relations that are supported by them. Love in close relation to infrastructures points to a radical engagement in the moments of failure.

The discussion surrounding *Infrastructural Love* emerged from the pedagogical space of the Critical Studies design studio at KTH School of Architecture led by editors of this volume between 2018-2019. The book’s theoretical support draws both on affect theory and on relational architectural ecologies, as well as on the domains of the architectural humanities, the environmental humanities and the posthumanities to situate its theoretical and practical work.

Our aim through this publication is to re-orientate an understanding of architecture by focussing less on a discrete object in a field or an autonomous icon in an urban milieu. Instead, we posit that architecture is what maintains the relations between people, places and things.

Joan Littlewood’s Fun Palace as Cultural Programme, 1961–1975

This research represents a new kind of critical investigation of the renowned Fun Palace as an emancipatory and complex cultural programme.

Historically situated, the Fun Palace maps an extensive network of practices and agencies involved in the programme’s active constitution and constant regeneration. Developed in London between 1961 and 1975 though an interdisciplinary collaboration between radical theatre entrepreneur Joan Littlewood, architect Cedric Price and cyberneticist Gordon Pask amongst others. It aimed to construct situations in which self-directed, open and playful exchange could activate mass-audiences. By 1964 the Fun Palace had gained momentum, and a giant cybernetic – interactive and evolving – infrastructure featured within the Civic Trust’s plans for Lea Valley. By the end of the decade, it turned into local activism focusing the youth amidst violent redevelopment in Stratford. A series of community-led temporary playgrounds emerging in vacant land adjacent to Theatre Royal tightened the bond between the theatre and the street. Over and above, the struggle for a site in the institutional map of London led the realisation of Fun Palace as a media event. Broadsheets, films, diaries, grids and press cuttings, all these media actively produced and disseminated the Fun Palace’s distinctive critical programme of emancipation through pleasure in Britain in the 1960s and 70s.

Paying close attention to Littlewood’s role in the programme, this research analyses the conditions of production, circulation, storage and reception of these media and interrogates the uneven Fun Palace archive, as a way to unpack the complexity embedded in the Fun Palace’s cultural programme and to challenge the stable image of radical architecture that its fifty-year long reception has constructed. Ultimately, I argue for the central role that media plays in the constitution of the Fun Palace’s complex cultural agenda.

Related publications:


LANDSCAPES OF ABANDONMENT AND INHABITION: SPACES OF FEAR, PLEASURE, CONQUEST, RETREAT AND EVERYDAY LIFE

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.
OE Case Files is a joint imprint of punctum books and the online journal Organs Everywhere, and a platform for questioning the scope and methods of architectural design.

Organs Everywhere (Œ) is an independent online journal that, since 2010, has been active in promoting conversations that approach architectural design from the edges of the discipline, plunging it into a strange fabric of marginal and experimental practices that fundamentally question its boundaries, technologies, methods and evaluation systems. Contributions combine research perspectives from architects, designers, philosophers, artists, science fiction writers, activists, poets, and scientists.

The journal values transdisciplinary, speculative and irreverent explorations over strict publishing formats and academic purity / orthodoxy, promoting a profanatory and open-ended research ethos. The investigations collected have the potential to redraw the disciplinary map of architecture and design, with a particular interest in hertzian space, cyborgian extensions, wet/living technologies, material computation, augmented reality, design fiction, prototyping, queer and monstrous ecologies, responsive and adaptive design, radical and exaptive modes of inhabiting, post-natural futurism, up-cycling, and alternative notational systems.

Key related publications:
Organs Everywhere No.5: Ghostly.


Websites:
organseverywhere.com
www.punctumbooks.com/imprints/oe-case-files
Oily Stories is an artistic research project that experiments with the materiality of oil and its encounter with different materials, environments, structures, bodies and political forces.

The project investigates how the stories of oil can be told through various methods of situated storytelling. In the manner of oil, oily stories are leaked, spill out of the petroleum infrastructures, flow over boundaries and expand their environmental, political and social effects by polluting the grand narratives, “white geology” and subjugating forces. The stories of oil are retold through experimental writing, short stories, situated storytelling and drawing.

The project draws its initial material from oil sludge, broken oil infrastructures, deserts, and the wetlands of southwestern Iran. It searches for traces of oil in Iranian literature and listens to the stories, jokes, rumours and myths among indigenous people of the region and the workers of oil sites and refineries. The project will be exposed through performances, installations and publications.

Related outputs:

PHENOMENAL TIME: A FIELD PHILOSOPHY FOR MORE LIVEABLE WORLDS

An interdisciplinary environmental humanities project that puts the ecological field of phenology into conversation with environmental philosophy and social theories of time.

It offers new approaches to the challenges of the climate crisis, exploring an inspiring site for predicting, understanding and responding to the changing environments we are all dependent upon.

Around the globe, stories of environmental mismatches in timing are demonstrating the complicated effects of climate change. In the Arctic, caribou are arriving at their feeding grounds too late for peaks in new vegetation growth and Atlantic puffins and European woodland birds are hatching chicks outside of the best times for catching prey. Importantly, this ‘time out of joint’ applies not only to ecological contexts, but social ones as well.

Conventionally, the time of our lives has been studied separately from the time of nature, but we need ways of understanding and responding to temporal mismatches in order to address the fundamental question of how to better coordinate ourselves in a time of climate breakdown. While the potentials of geological time has drawn much attention (Bjørnerud 2018), this project will explore a subfield of ecology – phenology – which studies cyclical and seasonal times in plants and animals. Studying the ways that living beings produce complex temporal arrangements with each other in order to make life possible – and the mismatches that occur when things shift – phenology shows us the possibilities and limits of recalibrating time when everything around us is changing.

Initiating a new conversation between the humanities, social sciences and ecology, this project draws on innovative methods in ‘field philosophy’ to support collaborative enquiries with professional and amateur phenologists. The aim is to explore how new understandings of time can play a role in fostering an awareness of interdependence in hope of more liveable worlds.
Reima Pietilä was considered ‘Modern Architecture Challenger’ in his native Finland. His theories and methods were progressive and often considered controversial particularly as they offered a different trajectory to Finnishness and Internationalism attributed to the work and legacies of Alvar Aalto.

This research project considers Reima Pietilä’s oeuvre as a long-term Research By Design methodology. Its outputs are varied, in multiple places and platforms but hope to culminate in a collective exhibition, conference and book publication.

The following essay by Wiszniewski, published in the Nordic Journal of Architectural Research, offers an example of the type of essay the research group is undertaking and what the book will contain.

This paper discusses Reima Pietilä’s Finnish Embassy (Suomen suurlähetystö) in New Delhi, India, in relation to the interplay of gesture and gesturality in the architect’s design process.

It takes theoretical impetus primarily from Giorgio Agamben and Vilém Flusser, who both write extensively and insightfully on gesture and each promote philosophical trajectories from ontology-as-being towards ontology-as-becoming.

The research-by-design inflection of this paper directs the ontology of gesture through a small selection of drawings from the Pietilä Archive, from the first and second phases of the building’s production, and photographs taken on site by the author in 2014. The paper offers a view not only of how gesture and gesturing lie at the heart of Reima Pietilä’s design process, but also how the communicative dynamic of the gestural feeds speculation into and pursuit of understanding through architecture.

Therefore, beyond framing a number of Reima Pietilä’s design methods and ways of thinking, the paper also addresses how gesture constitutes a core communicative principle in Reima Pietilä’s research-by-design methodology, ultimately suggesting that this methodology holds relevance for contemporary architectural design and research.

Related publications:
This book explores questions of tolerance in architecture from a range of disciplinary positions, through visual provocations and academic argument, drawn, photographic and filmic evidence.

Issues of control, containment, breaking points are exposed. How much do the interior limits of a material or spatial condition become a refuge, or alternatively become a site of constraint, intolerance or charged negotiation? Social, cultural and political tolerance and threats include control of information, image, author, reader, often evidenced in extremities, margins and marginality. What are acceptable levels of deviation, divergence, variation, imprecision? How do we understand spatial and temporal tolerance in the architectural project as research inquiry or conceptual field? What is at stake in physical and digital tolerances – in material assemblages, production, and between drawing and building, purity and impurity?

Authors probe editorial processes, research practice and publication, design and critique of built form, the urban exterior as a site for social, material adjustments, and city reconstruction. This collection seeks to instigate more open-ended relationships, interpretations and iterations between theory and practice – between textuality, visuality and aurality – to sway between and across arts and humanities disciplines with empathy and insight. Attentive to disciplinary tolerances and constraints – environmental, cultural, aesthetic and philosophical – and movement between established architectural knowledge and new technologies, and towards a sensorial enrichment and essential augmentation of interdisciplinary research.

In light of our agenda to accommodate cultural, artistic, class and gender difference, chapters present varied cultural and geographical positions and perspectives that examine aspects of the discourse, practice and research of architecture.

Further, we hope that we have enabled some productive (minor) disciplinary manoeuvring.

Related publications:

A research project exploring the coastal landscapes of the north west highlands in the context of contemporary socio-ecological transitions.

The widely accepted picturesque beauty of the northern Highlands dissimulates contemporary realities and complex social, ecological and political histories. The paradoxes, problematics and potentials present in the landscapes of the north of Scotland have recently been pulled into focus by the designation, in 2014, of the North Coast 500 tourist route. Indeed, the marketing of the NC500 initiative appears to be based upon two premises. Firstly, the focus on the experience from the route advocates the landscape as an exclusively visual experience. Secondly, the road trip mindset suggests an individual automobile experience, a journey into an apparent “wilderness” in truth partly forced upon these landscapes through one of the most violent episodes of Scotland’s recent past: The Highland Clearances.

This landscape architecture designed research project seeks to develop the following questions: In light of declining fossil fuel resources, is it appropriate to promote this form of travel and tourism in Scotland and in other northern territories where similar approaches have been deployed? Is it acceptable, today, to advertise a tourist experience grounded in picturesque constructions without acknowledging the social and ecological nuances of these landscapes? How does this designation sit alongside Scotland’s 2050 Climate Vision and, more broadly, alongside a future socio-ecological transition? Since growth in tourism and natural capital enhancement hinge upon sustainable stewardship of the landscape, how might initiatives such as the NC500 be developed through a more inclusive landscape led approach?

**Publication:**
Public exhibition planned for 2020.
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:**


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?
THEATRES WITHIN THEATRES:
EXPERIMENTS OF WRITING A DISSIDENT
ARCHITECTURE

Theatres within Theatres is a series of performative writing experiments that are situated in politically-charged architectural sites ranging from public spaces to institutions and domestic spaces, exposing how a dissident architecture could be produced through the practice of writing.

Writing architecture is not writing about architecture; it instead aims to write it, to make it. Writing dissident architecture writes with multiple voices, with many authors, not all of whom are welcome. By situating writing in contexts where direct ways of expression are impossible, I expose how dissident writing can circumvent the bans of an oppressive power by inventing a dissident language. To develop a tactic of writing with unwelcome co-authors – i.e. writing with the dominant power, but against it – is what dissidence could bring into writing architecture. In this way, writing dissident architecture deals with two main questions. One is: how to tell a story we cannot tell? And the other: how can this struggle with an impossible narration create a dissident architecture?

Written in the intersection of architecture, performance and literature and using means of experimental writing and critical fiction, this book project offers an account of the performative acts of various characters who critically inhabit existing architectural sites and thereby construct ‘performing grounds’.

The notion of theatres within theatres, borrowed from Bonnie Nadzam, refers to the complexity of dissident spaces and dissident acts. Appearing and disappearing in different corners of these architectural sites, the characters encounter one another, switch roles, and make momentary stages, wings and backstage for their dissident acts to be performed.

This book proposal is based on my PhD dissertation Interruption: Writing a Dissident Architecture, finalized at KTH School of Architecture in April 2018.
Related publications:

http://ruukku-journal.fi/en


PhD Dissertation: ‘Interruption: Writing a Dissident Architecture’
Stockholm: KTH Royal Institute of Technology:


TO WHERE IT MAY CONCERN

Performance, spoken word and design led investigation exploring the conceptualisation of landscapes and the transposition of narratives in the context of colonialism and globalisation.

A Scottish landscape, collected in Armadale, Skye and Armadale, West Lothian has been delivered to Armidale, New South Wales. Transported in a wardrobe trunk, it contains new geologies, old geologies, sketches, reels, reams, light, so much light, lino prints, cyanotypes. The contents of the trunk are an overlapping narrative performance which highlights collective aspects of weathering in the actants of the combined notion of the ‘Scottish landscape’ as it travels around the World. (Weathering is considered as proposed in Neimanis, A. & Hamilton, J.M., 2018. ‘Weathering’, Feminist Review, 118, pp. 80–84.) Since its original conception this conceptual landscape has been transposed from New South Wales to South Wales. This project investigates the ways in which people project their own understanding of ‘landscape’ on to environments that they come into contact with.

The work explores how perceptions and projections of landscape influence how people experience an environment as a place situated with stories. Each time the conceptual landscape is performed, it is unfolded through a 15 minute spoken word performance.

Whilst collecting and transposing narratives, the work seeks to engage with scales of time. For example, the Torbanite geologies of New South Wales, named after Torbane Hill, West Lothian, slag heaps, demonstrate new geologies of displacement. The performance explores manifest pressures of colonization, capitalism and climate change. The project engages with divergent perceptions of the environment, while interrogating the conflicting and combined narratives that create landscapes that are more than a physical manifestation.

Live performances:
UGLY, USELESS, UNSTABLE: NEW MATERIALISM 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 their 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 conjoins 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
VISUAL RESEARCH METHODS IN ARCHITECTURE

The emergence of studies in visual culture has changed the research methodologies practiced by many humanities disciplines.

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.

Twenty-four contributors, including ESALA Researchers, Fiona McLachlan and Miguel Paredes Maldonado, 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 book explores 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 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 theories and disciplines of practice as co-editors since 2013 of international peer-reviewed journal, Architecture and Culture (Taylor & Francis).

Related publications:

Visual Research Methods in Architecture

EDITED BY
IGEA TROIANI & SUZANNE EWING
‘Voices of Experience’ is a collaborative project which choreographs site-based conversations between architects at different stages of their career.

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 Hurd, 1938; 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 and activist Kate Macintosh, architect Denise Bennetts, conservation architect, Jocelyn Cunliffe, past RIAS President, Joyce Deans and creative director Adele Patrick. They have been joined by Mairi Laverty, Nicola Mclachlan, Cathy Houston and Emma Fairhurst of Collective Architecture, Glasgow, planner Heather Claridge of Glasgow City Council, Melanie Hay, conservation architect, and Grace Marks, coordinator of RADIAL project, Elaine Keenan of Glasgow City Council, self-build architect, Akiko Koyabashi and RIAS New Chapter member Ruta Turcinaviciute.

A collection of 10 conversations and 4 events (2016-2019) have been compiled in audio and transcription format. These document experiential accounts of architectural practice and projects, and offer insights into working within Cumbernauld New Town, the Clyde Valley, post-war housing, Glasgow Necropolis, Linlithgow, Edinburgh’s historic centre and University quarter, self-build housing, professional culture building, collaboration and archival activism. These will be available on the University of Edinburgh DataShare repository from late 2020, linked to Glasgow Women’s Library and the Dictionary of Scottish Architects.

Related outputs:


Website:
http://wearepanel.co.uk/projects/remnants
CHAPTER 07

Social Inclusion and Urban Governance
ABERLOUR FAMILIES AND COVID-19

Research into the effects of COVID-19 on the families using Aberlour’s urgent assistance fund, created to support families through the pandemic.

Since the outbreak of COVID-19 Aberlour has been providing financial assistance to families across Scotland via its Urgent Assistance fund. Aberlour invested £100,000 in the fund and received a further £350,000 (approximately) from other funds and donations, bringing the total fund value close to £500,000. To date, more than 1,200 families have benefited from the fund.

The research will undertake a process and outcome evaluation to identify:

• The needs of families across Scotland.
• How Aberlour is meeting these needs.
• How the fund works for applicants and their sponsors.
• What policy and practice recommendations Aberlour can make using data from families.
• How the fund should be developed and used in the short- and medium-term future.
MINIMUM UNIT PRICING WAS INTRODUCED IN SCOTLAND IN MAY 2018 WITH THE AIM OF REDUCING THE AMOUNT OF ALCOHOL THAT PEOPLE DRINK.

Existing evidence suggests that it may be effective for the general population, but the impact on very vulnerable people, including those who are homeless or drink on the street, is unknown.

This study examines the impact of MUP on homeless peoples’ and street drinkers’ consumption of alcohol and other aspects of their lives such as involvement in other forms of substance misuse, crime, begging, relationships with family/friends etc. It will also explore the implications of MUP for services supporting homeless people and street drinkers and reflect on policy implications. 

Website: www.healthscotland.scot/health-topics/alcohol/evaluation-of-minimum-unit-pricing-mup/separately-funded-evaluation-of-mup
An ethnographic study of multiple crises, emerging solidarity networks and active citizenship in Athens

This ethnographic study is part of an ongoing project that over the last decade has looked at collaborative practices within emerging creative networks of artists, activists, and refugees in Athens as well as in a transglobal context (Travlou, 2013; 2014; 2017; 2020).

My central question is how communities and groups within these networks form and change through the collaborative activities of their members. Collaboration may mean different things to different people. In my ethnographic work, I approach collaboration as the key precondition for an economy of care where solidarity and mutual aid are at the heart of its exchange value system. Current mainstream representations of the ‘crisis’ (‘financial/debt crisis’, ‘refugee crisis’, ‘Covid-19 crisis’) often portray it as (only) a catastrophe. Instead, I am interested in exploring the opportunities for socio-political change and novel forms of active citizenship that could emerge from the collaboration, friendship, care, trust, solidarity – in one word, comradeship – between people that these ‘crises’ have brought together.

Between 2015 and 2018, I looked specifically on the refugee crisis in Athens investigating the role of refugees/migrants as active agents within local solidarity networks. The study has explored the way migrants exercise their agency to construct new forms of citizenship through a politics of care in this moment of political and economic instability. This ‘politics of care’ allows migrants/refugees to develop a political consciousness in which caring is invoked as a symbol of power to build new kinds of citizenship and solidarity.

The study has engaged with practices of collaboration and peer learning that strengthen and expand the groups and collectives in which refugees/migrants participate, and, by doing so, contributes to the making of common spaces in the city. The fieldwork has looked at spaces within a solidarity network formed around collaborative/sharing practices among local and international activists and migrants/refugees (i.e. collective refugee kitchens, housing squats for refugees and self-organised migrant collectives).

Along with the refugee crisis, there has also been a growing housing crisis that in recent years has been intensified. Central neighbourhoods have gone through aggressive gentrification strategies and touristification where local tenants unable to afford the rapid rise of rents have left intentionally or being evicted. Existing social movements and solidarity networks have shown a mutated mobilisation shifting their focus on these new urban phenomena. Using collaborative research tools that traditionally being used for militant ethnography, I have been actively involved in activist groups on
housing rights. Since March 2020, the focus of those activist groups and solidarity networks has shifted again towards the latest crisis, that of Covid-19. A number of mutual aid initiatives emerged during the lockdown months. I am currently looking on these mutual aid groups and how - through collective action and collaborative practices - they create an economy of care as well as spaces of commoning.

Related publications:


Media Coverage:


https://www.youtube.com/watch?v=r8WOOHWCBw
Destitution in the UK 2019 builds on research published in 2016 and 2018 which defined destitution, its scale and causes.

The aims of this follow-up study are:

- to update our national estimates of the overall scale of destitution in the UK to 2019;
- to identify trends with respect to the overall prevalence of destitution in the UK, and also its social and geographical distribution;
- to deepen our understanding of the drivers of destitution and the experiences of those directly affected, and how these drivers and experiences may be changing over time;
- to reflect on the key policy and practice implications of these findings.

In 2017 1.5 million people in the UK were pushed into destitution, going without the bare essentials and locked out of the chance of building a decent and secure life.

Related outputs:


Website:  
www.jrf.org.uk/report/destitution-uk-2018

www.i-sphere.hw.ac.uk
DOCHAS EVALUATION

Assessing the effectiveness of an assertive outreach housing support service for former homeless people in Scotland’s Outer Hebrides

This study will assess the effectiveness of an assertive outreach service which shares some of the principles of Housing First on Scotland’s Outer Hebridean Islands. It will provide valuable insights into ‘what works’ in the delivery of housing-led and housing support services for vulnerable individuals in rural contexts.
A group of 12 vanguard cities on six continents have committed to end street homelessness by 2030 as part of the Institute for Global Homelessness’ A Place to Call Home initiative.

This team will be on the front line of the larger global movement, leading by example and demonstrating what’s possible. Each city has committed to achieving a goal by the end of 2020 that puts them on a path to ending street homelessness by 2030.

This research will work across all 12 cities preparing in-depth, qualitative case studies which evaluate what works, for whom, in what circumstances, informing how to take on the challenges of ending street homelessness across the globe.

Website: www.ighomelessness.org/a-place-to-call-home-initiative
www.i-sphere.hw.ac.uk
ESTIMATING THE CURRENT SCALE OF HOMELESSNESS AMONGST EEA NATIONALS

Understanding the specific causes and impacts of homelessness amongst EEA nationals and addressing the need to understand the true scale, causes and impact of homelessness among EEA nationals living in the UK.

From April 2018 to April 2019, an estimated 15,760 EEA national households were owed a homelessness or prevention relief duty in England. However, these figures struggle to capture the wider extent of homelessness and the different sub-groups of homeless people that exist. Capturing the true extent of homelessness is a challenge and official government data is likely to underestimate the true scale of homelessness.

This project analyses existing data sources to develop a greater understanding of the scale and issues facing EEA nationals who experience homelessness.

Through new survey and qualitative interviews it will also explore:

• Why EEA nationals originally migrated to the UK.

• Their experience of living in the UK and how they became homeless – identification of specific ‘life events’ that may have led to their homelessness.

• Their current experiences of homelessness and daily life in their local area.

• Their hopes and fears, including the barriers and challenges they face to escaping homelessness.

• Their perspectives on how the UK’s withdrawal from the EU could impact their lives.

The analysis will include policy and potentially practice recommendations to reduce homelessness and the impacts thereof on people from the EEA living in the UK now and post Brexit.
The Homelessness Monitor is commissioned by Crisis and is funded by Crisis and the Joseph Rowntree Foundation providing an independent analysis of the homelessness impacts of recent economic and policy developments in the United Kingdom.

It considers both the consequences of the post-2007 economic and housing market recession, and the subsequent recovery, and also the impact of policy changes.

The first English monitor was released in 2011 and with eight annual report years, the subsequent reports document the change in homelessness trends since this baseline data was undertaken in England, Scotland, Wales and Northern Ireland.

A wide definition of homelessness is adopted in the Homelessness Monitor, and considers the impacts of relevant policy and economic changes on all of the following homeless groups:

- People sleeping rough.
- Single homeless people living in hostels, shelters and temporary supported accommodation.
- Statutorily homeless households – households who seek housing assistance from local authorities on grounds of being currently or imminently without accommodation.
- ‘Hidden homeless’ households – people who may be considered homeless but whose situation is not ‘visible’ either on the streets or in official statistics.

The series uses four main research methods:

1. Review of literature, legal and policy documents.
2. Annual interviews with key informants from statutory and voluntary sectors.
3. Statistical analysis on a) economic and social trends, particularly post-2007; and b) trends in the four homeless groups.
4. Online survey of local authorities.
Related outputs:


Website: www.i-sphere.hw.ac.uk
Housing First England Evaluation

The study is an evaluation of the major MHCLG Housing First pilots in three combined authority regions: Greater Manchester, Liverpool City Region and West Midlands. The study involves formative, process, impact and economic evaluations.

The evaluation is being led by ICF Consulting, and involves a consortium between ICF, Heriot-Watt University, BPSR Social Research, Homeless Link, and the Institute for Employment Studies (IES).

Website: www.gov.uk/government/news/housing-secretary-james-brokenshire-awards-funding-to-reduce-rough-sleeping

www.i-sphere.hw.ac.uk
| **BY:** | Sarah Johnsen  
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ICF Consulting  
Housing First Scotland |
| **FUNDING:** | £170,000  
Corra Foundation |
| **YEAR:** | 2019 – 2021 |

## HOUSING FIRST SCOTLAND PATHFINDER EVALUATION

The Housing First Scotland Pathfinder project represents a significant development in the expansion of Housing First (HF) provision across Scotland within the context of a broader policy shift toward rapid rehousing by default.

The research will involve an assessment of monitoring outcomes, process evaluation (including fidelity assessment) and cost benefit analysis. It is being conducted in partnership with ICF Consulting.

**Website:**
- [www.ghn.org.uk/shien/housing-first/](http://www.ghn.org.uk/shien/housing-first/)
- [www.i-sphere.hw.ac.uk](http://www.i-sphere.hw.ac.uk)
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.
John Brennan, Resilient Borders.
Photo: Stephanie Crane.
Maximising the impact of the Social Innovation Partnership in Scotland.

The Scottish Government’s Social Innovation Fund (SIP) has supported over 60 varied projects which contribute to Scotland’s National Outcome Framework.

The social enterprises supported through the SIP use a variety of approaches to support people in crisis, but all are developing innovative models that take a relational approach to welfare, supporting people to develop their capabilities, enhance their well-being, and improve the scope for them to move out of poverty.

This project will work with the SIP and funded social enterprises to address four key research questions:

1. What impact have the projects funded through the programme had on the well-being and capabilities of people facing social disadvantage and child poverty?

2. To what extent does the relational approach taken account for any successful outcomes identified?

3. What are the core components of models that are effective in sustaining positive outcomes and may be suitable for scaling up?

4. How can systems adapt, or where appropriate be disrupted, to support relational approaches to public services?
STUDY OF WOMEN’S EXPERIENCES OF SEVERE AND MULTIPLE DISADVANTAGE

Generating qualitative evidence to inform interventions that prevent, ameliorate and/or resolve experiences of severe and multiple disadvantage affecting women.

The study will produce a robust and rich qualitative evidence base to inform the development and delivery of services which have potential to more effectively meet the needs of women facing severe and multiple disadvantage (SMD).

The research will be conducted in four case study areas. It will engage women with lived experiences of SMD using innovative techniques to understand their stories and what interventions could or would have supported them.

These will include:

- Timeline interviews – developing a timeline of life events and critical junctures in their life histories mapping interventions and potential missed opportunities.
- ‘Go along’ interviews – talking in an informal and unstructured way.
- Self-directed photography – wherein a woman with lived experience takes photos of places and/or things that are significant to her and the images are used as conversational prompts.

The research will also include one-to-one interviews and focus groups with women and practitioners supporting women. We envisage that the outputs will prove to be valuable tools for service providers, campaigning bodies, commissioners and policy makers operating at a range of levels in determining when and how to more effectively meet the needs of women and, where relevant, dependent children. Importantly, the study will aim to identify critical junctures wherein intervention has capacity to prevent, or where necessary ameliorate and resolve, manifestations of SMD affecting women.
SUPPORTING OAK’S EVALUATION AND RESEARCH ON HOMELESSNESS

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.

Related outputs:


See:
www.i-sphere.hw.ac.uk
Gathering evidence on what is driving hunger in the UK and who it affects, in order to create policy recommendations to end hunger in the UK.

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.

In addition to the State of Hunger research, we have been commissioned to analyse the potential destitution and foodbank demand resulting from the COVID-19 crisis in UK.

Related outputs:

Websites:
https://www.trusselltrust.org/state-of-hunger

www.trusselltrust.org/what-we-do/research-advocacy/

www.i-sphere.hw.ac.uk
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.
This study is a qualitative evaluation of the Social Innovation Fund’s Stage 3 development and expansion of Shelter Scotland’s ‘Time for Change’ pilot project.

The pilot involves peer mentors (people with lived experience of homelessness) supporting other homeless people to access support services in Dundee, Aberdeen, Edinburgh and Glasgow.


Website: scotland.shelter.org.uk/about_us/projects/time_for_change

www.i-sphere.hw.ac.uk

Photo: Brian Capaloff
UNSEEN INFRASTRUCTURES: MIGRATION, RACIALISED LABOUR AND MAINTENANCE AND REPAIR IN BRITISH CITIES

The various socio-material infrastructures that produce and maintain racialised identities and hierarchies in British cities.

This project examines relationships between forced migration, unseen labour, maintenance and repair of (public) infrastructure, and the reproduction of racialised identities and spaces in British cities.

It highlights how various infrastructures, including architectures of memorialisation, housing infrastructures and the built environment are shaped by the UK’s colonial history and present hostility towards migration. They thus become key mechanisms through which the hostile environment is animated and reproduced in everyday life.

The project also explores forced migrants’ experiences of performing infrastructural labour, working in essential services such as care and food processing and in warehouses and distribution centres.

Through these jobs, they gain important forms of autonomy, but are also reproduced as racialised, disposable labour. The project aims to provide detailed narratives of people’s everyday lives, experiences of work and movements across different parts of the city, particularly when they are doing shift or after-hours work. It sheds light on the ways in which everyday urban life is made through and reliant on physically taxing, embodied labour that is often performed by racialised and marginalised groups.

Situated in Sheffield and Barnsley, research comprises detailed interviews with refugees, action research carried out with a charity and activist organisations supporting forced migrants, and ethnographic observation of spaces used by various migrant communities.

Key related publications
When lone-mothers receive child maintenance the risk of poverty reduces and the poverty gap closes by 30% in the UK.

Child maintenance is where a non-resident parent regularly gives money to the parent with whom the child lives most of the time as a contribution towards the costs of raising a child. When the non-resident parent pays child maintenance they are also more likely to remain actively involved in their children’s lives.

This research uses longitudinal quantitative data from children and parents and, qualitative data from children, to explore the impacts of the payment/non-payment of child maintenance on child and lone-parent socioeconomic and other outcomes.

Website: www.i-sphere.hw.ac.uk
CHAPTER 08

Housing and Property – Planning, Design and Market Operation
DYNAMICS OF COMMERCIAL PROPERTY CYCLES

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:**
- Oyedokun, T., Dunse N. and Jones C (2018) “The impact of a green premium on the development of green offices in the UK”, *Journal of Sustainable Real Estate, Volume 10*, pp 81-108. This paper has been awarded a prize by the American Real Estate Society.
E V O L U T I O N  O F  T H E  U R B A N  R E T A I L 
C E N T R E  H I E R A R C H Y :  U R B A N  R E T A I L 
C H A N G E

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.

Colin Jones was invited to present a paper on this work at the University of Chicago in November 2018.

Related outputs:
EXPLORING THE LIVEABILITY AND SOCIAL SUSTAINABILITY OF MICRO-HOUSING IN THE UK

Micro-homes are compact, energy efficient, high density forms of housing which appear to satisfy multiple policy objectives related to housing provision, affordability and sustainability.

The sector is very varied, ranging from low-carbon and eco-conscious stand-alone dwellings made with innovative materials and designs, to shoe-box bedsit or studio flats created from the conversion of existing offices and commercial buildings. There is also a related, but distinct, application of micro dwellings as accommodation for the homeless, either individually or arranged in villages. However, while there is ongoing discussion about the merits of this category of housing – there has been little considered scrutiny of the parameters that make micro-homes more or less good places to live.

In this work, I am interested in exploring different dimensions of contemporary micro-housing. First the narratives and discourse around these homes among architects, designers and developers. A common narrative seems to be about micro-homes as supporting a new way of living and new lifestyles. Second, I am interested in the motivations and experiences of people who live in these homes – are they attracted by the resource and energy efficiency of small-home living, or is it just about affordability? Are micro-homes good places to live, or a substandard form of modern housing?

Some pilot work in 2018 points to significant compromises for residents, having to sacrifice certain standard items (freezer; dishwasher; dining table; storage) – and few, if any, advantages over other larger flats.
Covid-19 has increased reliance on digital data to help housing associations work with their tenants.

The work will respond to the current situation and the abrupt shift to digital interactions between housing associations (HAs) and their tenants. Digital communication systems rely heavily on the use of data. This project has developed a pilot online workshop to explore attitudes around the use of personal data by social housing tenants. This short project is exploring the process of giving ‘informed consent’ for the Housing Association sector when sharing personal data. We have developed an online workshop tool to support people in identifying types of personal data, considering their potential uses, and our levels of comfort in sharing them in different contexts. Our aim is to create tools that will provide a simple, visual way to support discussions around personal data from tenants.

In this project we are focussing on how social housing tenants may be willing, or not, to share various types of personal data.

Some examples of this are:

• Data derived from home IoT technologies that feed into new systems and services designed to improve home environments.

• Well-being e.g. home heating systems that gather data on temperature and moisture levels within specific rooms.

• Health issues relating to adjustments in the home.
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 by Lund Humphrie in 2021.
John Brennan, Out of Town.
Credit: Stephanie Crane.
Home is more than simply shelter. It is not just the place where we live, but has a huge influence on how we live. It can shape our health and wellbeing, as well as our work and prosperity.

It also impacts on the quality of our environment and the strength of our communities. Housing touches every part of life in Scotland, from childhood to old age.

*Present Voices Future Lives* was a travelling exhibition which toured Scotland between early November and late December 2019, visiting twelve locations (cities, islands, towns and rural) speaking to people, gathering their thoughts, ideas and aspirations on how Scotland’s housing should look and feel by 2040. The interactive exhibition was commissioned jointly by Architecture and Design Scotland and the Scottish Government to engage the public on some of the issues and challenges around housing today and in the future. The feedback gathered is aimed to inform the development of the vision and route map for housing over the next 20 years in Scotland.

The views collected through the consultation and the travelling exhibition will help to inform the Scottish Government’s final vision and route map for housing over the next 20 years.

Listening to voices from across the country and across generations can help to inform the creation of a housing system that adapts to the challenges that tomorrow brings, from an ageing population to the climate emergency. The exhibition was to be toured around Scotland visiting 12 locations, representing communities across Scotland.

This needed to include cities, towns, and rural and island communities. The primary audience for the exhibition was the general public and the activities had to include engagement with children and young people.

Films made as part of the project were shown at the RSA Annual Exhibition.

**Related publications:**
https://www.ads.org.uk/ht2040exhibition/

**Website:**
https://www.rsaannualexhibition.org/architects/
The ‘Present Voices Future Lives’ exhibition
The UK Collaborative Centre for Housing Evidence (CaCHE) is a consortium of 14 institutions led by the University of Glasgow.

The centre, which was established in August 2017, is a multidisciplinary partnership between academia, housing policy and practice. Over the course of the five-year programme, CaCHE researchers will produce evidence and new research which will contribute to tackling the UK’s housing problems at a national, devolved, regional, and local level.
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.
CHAPTER 09

Project Management and Construction Technology
ARBOLIVIA: A SOCIAL ENTERPRISE FOR SUSTAINABLE USE OF TIMBER THINNINGS IN BOLIVIA

The main cause of deforestation in the Bolivian Amazon is poverty. This forces poor farmers to fell prime rainforest to survive.

The ArBolivia Project provides a real alternative by offering a true partnership between social investors from the developed world and poor subsistence farmers and their families.

ArBolivia is a project established to combat deforestation in the Bolivian Amazon and managed via a UK registered not-for-profit social enterprise, The Cochabamba Project Ltd. Working with around 1,000 families the project enables poor farmers to better manage their land while helping them to grow, harvest and sell native hardwood trees. The resulting reforestation helps to protect the rainforest from further encroachment. Any future profits will be reinvested for the benefit of target communities in Bolivia.

ArBolivia would like to explore the potential for their timber to be used to make construction products, including timber buildings.

This project will explore the potential for the development of timber construction products using low and appropriate technology equipment. This will involve evaluating three key factors:

1) The socio-technical context of ArBolivia for innovative design and construction

2) The social, economic and environmental impacts in relation to the use of the timber

3) The properties of the timber being grown in the plantations.

The earliest crop is now 12 years old and ready for the second round of thinning, creating a large volume of low quality but useable timber which is difficult to sell in Bolivia in current market conditions.

ArBolivia would like to explore the potential for their timber to be used to make construction products, including timber buildings.

The output of this project will be used as the basis of a further funding application to enable ArBolivia to develop a demonstration project that involves fabrication of construction elements and the construction of a building.
KTP project aiming to develop a bespoke, real time data information portal and dashboard for effective and efficient construction decisions

This is a Knowledge Transfer Partnership (KTP) project that links Heriot-Watt University with Carey’s. This is an unique opportunity that brings together the disciplines of Construction Project Management and Computing Science to deliver a company tailored and streamlined information management system, CarLi (Careys Live). The aim of this project is to develop a bespoke, real time data information portal and dashboard for effective and efficient construction decisions. This involves effective, market-leading processes which produce live data for commercial reporting, health & safety, quality, project status and productivity, and reduced company exposure to risk.

The vision is to have a bespoke, cloud based, digital information management system for every construction project which tracks quality, health and safety, engineering, commercial, planning and project processes – turning paper based systems into an app based portal. Data will be collected, integrated with reports for all levels of the business, and produced in real time. This will lead to an intuitive user centered system which will collect and push the correct level and detail of information to the right people at the right time.
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 Creabton 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:

OPENING DOORS — FOR BUSINESS IMPACT

Through a longstanding relationship The University of Edinburgh has made a major, transformative contribution to the business strategy and growth of MARTEC Engineering Ltd.

A three-year Knowledge Transfer Partnership has led to innovative new product, investment in digital fabrication and opened up new markets for the company.

Martec Engineering Ltd, fabricates high quality steel products and systems for the construction industry. Based in Cambuslang, Glasgow they operate across the UK, primarily in Scotland and London. Martec specialises in secure entry systems, passive fire systems, architectural metalwork and facades, providing a full design, manufacture and installation service.

In 2003 Martec completed a partnership with the University of Edinburgh under the Teaching Company Scheme (TCS). The outcome was a new entry system, fully certified, marking a strategic move towards the social housing sector. Security door sales shifted from 40% to 80% of their turnover.

In 2015 the CEO, Martin McHugh returned to the University with the request, ‘I am looking at designing the next generation of doors to be produced by Martec over the next ten years and I clearly need you and Edinburgh University on Board.’ A KT partnership was funded for three years. The partnership aims were:

- Expand Martec’s reach into new market sectors.
- Develop new products with improved environmental performance, safety and aesthetics.
- Introduce digital fabrication into production.
- Enhance client support in the new sectors by incorporating BIM, 3D modelling and architectural design.

The resulting new secure entry system: comprising doors, screens and entry control, challenges conventional practice.

In the vast majority of systems, entry is controlled by electromagnetic locks. To achieve certification, ‘Secured by Design’ each system has to pass rigorous third-party testing. Each lock had to sustain an applied force of 4.5 kN. During the project it was discovered that there had been very little research into this and the UoE undertook a major experimental study, which raised concerns on the actual effectiveness of these locks. The new design adopted an electro-mechanical lock that exceeded requirements for certification and allowed a slim-line design to the frames and screens with increased glazing. In the social housing sector controlling entry to communal blocks is one of the most significant elements in tenant security and satisfaction.
The Grenfell fire tragically demonstrated the critical importance of fire safety in social housing. Many authorities do not consider electro-magnetic as safe exit points as they cannot generally be operated directly at the door. The new system with electro-mechanical locking provides both certified secure entry and safe egress and is as far as we know unique in the UK market.

The impact of the partnership on the company has been significant. Since the start of the project the turnover has increased from £4.7 to £6.5 million and the number of employees have increased from 53 to 80 in 2019. These figures include new senior posts in design, sales and production. The company has also invested around £90k in digital fabrication equipment and integrated design software.

The KTP also developed a fire rated bin hopper, normally used in multi-storey apartment buildings, to date is has generated over £1.2 million of new sales.

The partnership grades by Innovate UK as outstanding, the highest possible, and the project has recently been shortlisted for the Business Impact in the Best of the Best Awards, to be announced in September 2020.

Reference:

'Let no unfair or unjust person enter.' Martec door and third party test and certification
THE EDUCATIONAL OPPORTUNITY FOR BUILDING A RESILIENT FUTURE

This Royal Academy of Engineering – Frontiers of Development project focuses on ‘education for resilience’.

It will develop multi-disciplinary, cross institutional, student centred blended pedagogies that promote resilience-thinking that is urgently needed to navigate uncertain futures across multiple contexts worldwide.

This project targets a significant gap in education for resilience as well as the need for accessible and targeted syllabus content that can be used in perpetuity. It enables ongoing multi-disciplinary cross-institutional collaboration between students and teaching staff through dynamic, student-centred, interactive and blended pedagogies that include both face-to-face and online modes.

Critically, a framework will assist in the development of curricula that is transferrable beyond geographical confines, promoting resilience-thinking that is urgently needed for learners to navigate uncertain futures across multiple contexts worldwide.

This project is envisaged as a foundational stage for ongoing collaboration through the education of the next generation of university graduates.

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FUNDING: £18,000 Royal Academy of Engineering, Global Challenge Research Fund (GCRF) Frontiers of Development

YEAR: 2019 – 2021
CHAPTER 10

Environmental Sustainability and Low Carbon
A network+ for the decarbonisation of heating and cooling.

Led by Dr Andrew Smallbone at University of Durham, and involving Heriot-Watt, Leeds, Northumbria, Oxford and Brunel universities, the H+C Zero Network will be investigating the decarbonisation of heating and cooling across residential, business and industry sectors. Such a monumental change to these sectors can only be delivered through the collective advancement of science, engineering and technology combined with prudent planning, demand management and effective policy.

The aim of the proposed H+C Zero Network will be to facilitate this through funded workshops, conferences and secondments which in combination will enable researchers, technology developers, managers, policymakers and funders to come together to share their progress, new knowledge and experiences.

It will also directly impact on this through a series of research funding calls which will offer seed funding to address key technical, economic, social, environmental and policy challenges.

Starting from October 2020, over four years the proposed Network will focus on the following five themes which are essential for decarbonising heating and cooling:

Theme 1: Primary engineering technologies and systems for decarbonisation.

Theme 2: Underpinning technologies, materials, control, retrofit and infrastructure.

Theme 3: Future energy systems and economics.

Theme 4: Social impact and end users’ perspectives.

Theme 5: Policy Support and leadership for the transition to net-zero.

Website: [http://www.net-zero-research.co.uk/heating-cooling/](http://www.net-zero-research.co.uk/heating-cooling/)
The SISER project generates an intelligent, data centric, decision-making tool to inform retrofit processes and occupant comfort within existing buildings.

This research project, SISER, is aimed at developing an intelligent system and a decision-making process for energy retrofit towards the improvement of energy performance and occupant comfort in existing buildings. The bilateral collaboration brings together complementary expertise areas from construction management, architecture, electrical and electronic engineering and computer science.

Two key activities are addressed: 1) developing advanced ICT methods for the easy and precise energy modelling and simulation of existing buildings and retrofit scenarios, 2) collaborative decision-making for improvement of energy and comfort.

For both activities, novel methods and tools will be developed for the aim of improving the performance and quality of the existing buildings and realising environmental and economic impact.

SISER facilitates both automated and manual decision-making combining intelligent algorithms and human judgement. This research project differentiates itself from past research efforts by: 1) combining automated and human decision-making in an integrated system, 2) the development of novel image / video analysis methods for the energy analysis of existing buildings and alternative retrofit scenarios, 3) developing an integrated stakeholder-centred approach that addresses the conflicting interests and preferences of all stakeholders, 4) focusing on both occupant comfort and energy performance simultaneously.

Related outputs:
COMMUNITY-LEVEL ENERGY DEMAND REDUCTION IN INDIA (CEDRI)

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.

Website:
http://www.cedri.hw.ac.uk/
This study aims to formulate a specific assessment for eco-village development in China to guide the design, construction and operation stages with technical and quantifiable indicators and cover the social, economic and environmental aspects.

To achieve the goal, the existing commonly used sustainable development assessments, both international and Chinese domestic, were studied, and three Global Eco-village Network (GEN) registered eco-villages in China were examined. Therefore, the limitations were addressed, and the solutions were found for those assessments. In this case, a more comprehensive assessment can be formulated for existing and future eco-village development in China, in which the process of revising and formulating could be applied in other countries which share the same problems and challenges.

The study was carried out at four stages and in four years. At the first stage, various existing commonly used sustainable development assessments and their limitations were studied, and these study cases were examined and selected. The initial literature review which focused on the comparison of the British assessment methods, like BREEAM, and the Chinese ones, like GBES (Green Building Evaluation Standards) was completed. Besides, the methodology was determined in the same academic year. The second stage was for data collection by a series fieldwork in China and Scotland, specifically, four eco-villages in rural and suburban areas in China, the Huatao Eco-village (Chengdu), the Southern Life (Fuzhou), the Sunshine Eco-village (Hangzhou) and the Letu Eco-village (Zhangjiakou), and one Scottish project in Orkney.

The Chinese domestic sustainable development assessment methods were studied as well as the potential issues when applying to the select Chinese eco-villages. In parallel, a renovation of a historic building into a local arts centre in Orkney was investigated by examining ten years data on technical, economic and social sides, which provides valuable experience for addressing sustainable development assessment limitations and formulating a more comprehensive assessment method. It also offered a chance to compare the sustainable renovation in a single building in the UK to those refurbishments in the eco-villages of China.
At the third stage, a follow-up research was conducted during the second fieldwork to track aforementioned eco-villages’ development progress, and two more eco-villages in China were getting involved in as the study requires long-term tracking to identify the limitations of those existing assessments and find the solutions. At the final stage, a more comprehensive assessment method for eco-village development in China will be presented.

Related outputs:


doi.org/10.1016/j.scs.2020.102172
CESI: NATIONAL CENTRE FOR ENERGY SYSTEMS INTEGRATION

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 use 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.

Heriot-Watt will be focussing on Energy Demand, particularly that from the built environment. This will include understanding how the energy characteristics of buildings can be upscaled to that of communities of buildings.

Website: www.ncl.ac.uk/cesi
DECARBONISATION OF ENERGY SYSTEMS OF SOUTH ASIAN DEVELOPING ECONOMIES THROUGH REGIONAL COLLABORATIONS

Developing a methodology to explore the potentials of decarbonisation through regional energy collaborations

Despite the collective global recommendations for greenhouse gas (GHG) emissions reduction, due to the various constraints of countries, several nations are targeting emissions-intensive electricity generation into the foreseeable future. One of the rapidly developing countries of South Asia, Bangladesh, appears to be moving towards a fossil fuel-based (Imported coal dominating) model of development for the electricity generation sector. However, neighbouring South Asian countries such as India, Nepal and Bhutan are currently developing plans for increasing renewable energy penetration, as they have high renewable potential. Recent policy change in India has opened the avenue towards regional energy collaboration between Bangladesh, India, Nepal and Bhutan.

The objective of this project is to develop a methodology to explore the decarbonisation potential of a country through regional energy collaboration. In this project, Bangladesh’s decarbonisation potential would be investigated through regional electricity import-export with India, Nepal and Bhutan, especially from renewables up to 2050. The outputs would be achieved with the development of country-specific—for Nepal and Bhutan only as India and Bangladesh already has energy planning models named IESS 2047 and BD 2050, respectively—and a regional bottom-up long horizon energy-emissions model. In the regional model, the scenario-based energy-emissions model for Bangladesh, India, Nepal, and Bhutan would be connected, and diffident regional decarbonisation scenarios would be examined.

Website: https://www.ncl.ac.uk/supergenenhub/ senhubflex/flexfund1/senfc1-025/
Development of an aggregated control system for residential air conditioning units in India that can assist the electricity grid in accommodating the forecasted 7-fold increase in their uptake over the next two decades.

Incumbent methods of managing supply and demand of electricity in India are being disrupted by increased demand driven by economic and population growth, growth in connected intermittent generation driven by the low carbon transition and by the electrification of transport driven in part by urban air pollution concerns. It is widely acknowledged that new approaches are required to assist grid management if policy objectives are to be met.

A key driver of residential sector demand growth is uptake of residential air conditioning (AC) systems; this reaching 40% in many urban centres. This technology also represents an untapped demand response opportunity; for instance providing c8GW of flexible operating reserve in the US. The DAC project will develop a novel control system capable of accessing flexibility from existing residential AC systems in India. The system modifies operation of AC systems based on input from a multi-objective, cloud-based control platform using grid property triggers (e.g. voltage, frequency) and time based signals. The controller measures internal temperature in the dwelling to ensure that the accessed AC system flexibility is constrained by found, local thermal comfort requirements.

An evidence base for the system approach will be provided by a field trial involving deployment of DAC systems in a 30 dwelling, six-month field trial located in Tamil Nadu in Southern India. The design and commercialisation of the system will be guided by three stakeholder workshops that will determine control objectives, value opportunity and socialisation of benefit.
CHAPTER 10 / ENVIRONMENTAL SUSTAINABILITY AND LOW CARBON

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:


ENERGY IN (HERITAGE) BUILDINGS: SMART CONTROL

Development of an Artificial Intelligence (AI) based smart Building Environment Management System (BEMS) for optimised energy use and quality indoor environment.

Based a simple feedback algorithm, current Building Energy Management Systems (BEMS) controls the environmental conditions i.e. temperature, humidity and air quality by controlling Heating, Ventilation and Air Conditioning plant (HVAC) in response to the environmental conditions measured by sensors located in the buildings. Hence it is difficult to predict and not optimise the operation for best quality and energy efficiency, which is critical for buildings such as operation theatres, pharmaceutical factories and museums, as Scottish National Libraries, Galleries and British Museums, which are the clients of our industrial partner.

By incorporating an innovative modelling unit based on artificial neural network will create a platform that will provide those clients with a more enhanced service: providing the ability to model complex systems fast and accurately, and uniquely forecast and predict energy consumption and environmental conditions and react accordingly via AI which is ideal for effective close control applications.
ENERGY IN (HERITAGE) BUILDINGS:
UNDERSTANDING HYGROTHERMAL CONDITIONS INSIDE COLLECTION STORAGE BOXES

Applying ANN technology to determine acceptable microclimate parameters for the National Library of Scotland’s Collections to inform energy efficiency improvements in the UK Heritage Sector.

Important national collections must be constantly displayed and stored in a stable hygrothermal condition necessitating tight environmental control, which results in the requirement for sophisticated control systems for continuous environmental control and high energy consumption. This study intends to use ANN modelling and mock-up tests to examine the effect of environmental fluctuations in a room on the microclimate inside a number of typical storage and display cases. It aims to establish an acceptable level of fluctuation that would allow us to loosen current tight controls and therefore reduce energy consumption.

A second clear outcome would enable the exhibition and display of national collections within wider communities in their spaces with limited environmental control and simple heating systems.

Related outputs:
The aging population is a challenge for sustainable development in UK society. Age-related dermatological conditions such as dry skin are a common occurrence for older people and may cause discomfort.

In winter, this condition may become worse as people heat their homes, making the air quality much drier and subsequently exacerbating skin conditions such as: dry throat and skin and itchiness. This can disrupt sleep and lead to discomfort and even compulsive scratching, which can further damage the skin. The room humidity is overlooked in indoor environmental design and heating operation, yet room humidification can be a simple solution to avoid winter dryness with the assessment on its environmental and economic costs. Currently, there is no clear guidance on indoor thermal-humidity conditions as there is no evidenced data determining if there is an optimum trade-off between these costs and benefits.

This project investigates the effects of room hygrothermal conditions on older people’s comfort and skin condition and also the energy consumption associated with maintaining comfortable room conditions. A multi-disciplinary approach is applied through collaboration with a building physicist, building services engineer, environmental psychologist and two dermatologists. Its ultimate aim is to collect evidence-based data that would help to establish the guideline for design and running living environment that provides thermal and humidity comfort for older people with energy efficiency.

Over a period of three years, we are carrying winter surveys in an Edinburgh Care Home, where local residents are categorised as oldest-old occupants, who are more likely to suffer from dry skin, dry throat and other similar symptoms associated with winter dry.

These group of residents also have a high proportion of dementia and amnesia that make them unable to recognise such condition and response with adjusting measures such as applying moisturiser and drink water more frequently. In the surveys, we have developed a procedure that endeavours to minimise disruption of the residents’ daily routine and to maximise data collection. The data are collected over a range of various room conditions through simple domestic humidifiers and by two approaches. One is through physical measurement to obtain objective variables: the room temperature and relative humidity for room conditions and the Transepidermal Water Loss (TEWL) and the Stratum Corneum (SC) hydration for skin conditions. The other is through a questionnaire survey and interview with selected volunteers who have no cognitive problems.
Currently, we have results show that most of the rooms were warm and thermally comfortable according to both the objective measurement and subjective interview surveys. But the results reveal that the rooms were indeed very dry, 98% of the measured Relative Humidity was out of recommended comfort zone for older people and measured skin was dry too. The major concern is that the subjective survey results do not show the perception of dryness. This suggests that the older people are sensitive to temperature change but not to humidity change, even when measured results indicate dry skin. On the other hand, the TEWL appears to have a very close correlation with room condition, which allows us to carry on the investigation to find the most appropriate room humidity that is most suitable for oldest-old residents.

**Related outputs:**


DOI: 10.1016/j.buildenv.2020.106790


DOI: 10.1016/j.buildenv.2020.106790
Innovation in social housing is needed to help reduce fuel poverty and improve the quality of homes. This project identifies innovative approaches for designing, developing and maintaining homes in Scotland.

The project involved working with the SFHA and CS-IC to develop a better understanding of innovation in housing. Three themes emerged: ‘Net Zero Carbon Buildings’, ‘Modern Methods of Construction’ and ‘Digital Driven Technology’. The project considered design and construction issues, and also the lived experience of tenants. It recognised that improving the lifespan of the home is vital for social housing providers who maintain them, and the tenants who live in them.

Innovation in housing for both new and retrofit developments focuses on achieving ‘Net Zero Carbon’ through improved fabric of buildings combined with ‘Modern Methods of Construction’ including off-site fabrication. Both offer opportunities to reduce fuel poverty by improving the quality of housing. In addition, integration of renewable energy systems within homes and communities is an important element of reducing fuel poverty through reduced energy costs. ‘Digital Driven Technology’ presents interesting opportunities for designing and operating buildings using Building Information Modelling (BIM) software and Smart Connected Technologies.

REsponsive FLEXibility (ReFLEX) is a £28.5M project funded led by the European Marine Energy Consortium, with multiple industry partners, and Heriot-Watt University as the academic partner.

The aim of ReFLEX is to create a Virtual Energy System in Orkney, which intelligently manages the distributed and intermittent renewable generation of that region. To achieve this, the project will be modelling and demonstrating a range of technologies relating to local supply and storage of energy, as well as taking a new approach to modelling energy demand of buildings in that community.

Heriot-Watt University will be particularly focussed on the importance of energy demand within local energy systems, implementing a range of modelling solutions that allow informed decisions to be made around such issues as demand response, technology selection, and the integration of smart storage with buildings that have specific energy requirements.

The Urban Energy Research Group will be particularly looking at the bottom-up modelling of energy demand of groups of buildings. This will incorporate both thermo-physical modelling of buildings and statistical techniques applied to empirical information of energy use. The challenge of applying such techniques to multiple, not just single, buildings is core to the research outputs of the project.
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 setup 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:

Transforming Farming value-chains in Sub-Saharan Africa

Advance knowledge on the potential for socio-economically inclusive sustainable energy solutions (SES) to transform agricultural value-chains across sub-Saharan Africa through social and economically inclusive sustainable energy solutions (TRANSFARM).

For decades, governments in developing countries have focused on eradicating poverty and promoting socio-economic development through access to sustainable energy solutions. This is prevalent in sub-Saharan Africa, where about 600 million people lack access to electricity services and in Nigeria, where electrification rate is pegged at 45%, leaving 100 million people, mostly rural, poor agricultural communities without access to electricity. For Nigeria, the provision of SES is considered pivotal in filling the energy access gap, transforming rural agricultural communities while meeting the sustainable development goals (1, 5, 7 and 8).

The agricultural sector employs about 70% of the population and in its current state, it is unable to foster development as technological modernisation is low, and food production is not at par with local demand — hence, Nigeria spends about $22 billion annually importing food. Thus, the deployment of SES in the agricultural sector is not only expedient but can serve as a lever to promote farm productivity, increase incomes and reduce poverty.

Therefore, the objective of TRANSFARM is to increase farm productivity, revamp local agricultural value-chains and improve food security through the uptake of sustainable energy solutions (SES) in Nigeria.

We apply UK research expertise in partnership with an established network of Nigerian stakeholders to enhance the capacity for delivery of SES technologies among small and medium scale farmers. Our approach is to identify areas/points where SES is needed within Nigeria’s Agric-value-chain and in turn, investigate supporting SES and socio-economic instruments that will address observed needs and transform the value-chain.

With this research we hope to generate replicable disruptive socio-economic models that can be attached to SES to promote sustainable livelihood generation and create new agricultural value-chains that address the water-energy-food nexus challenge.
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.
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