



THE UNIVERSITY
of ADELAIDE



School of Architecture and Built Environment

Research Capability

The School of Architecture and Built Environment is recognized for research excellence in sustainable built environment; cross cultural and historical studies particularly of Asian and Middle Eastern architecture, landscape and art; and design and practice-based research.

Cities: Urban Design, Planning and Landscape Research

Researchers in the School undertake a wide range of research in various aspects of urbanism. Grounded in evidence-based approaches, the research contributes to sustainable urban development and policy.

Urban and Regional Planning

Previous work in the field of urban planning has focussed on questions relating to urban growth strategies and infrastructure funding and provision as well as policy relating to adaptation to climate change. Further land use policy related research has examined mitigation to climate change, principally through the analysis of energy demand and greenhouse gas emissions on a small area basis along with the estimation of renewable energy potential using discreet local areas. Housing affordability based on locational analysis is a further area of research interest and capability.

Climate Change Impact on Coastal Communities

Rising sea levels are evident from monitoring data around Australia and climate change predictions suggest that these trends will accelerate over ensuing decades. A number of externally funded projects have sought to address how this issue can be approached using planning policy tools to regulate development in vulnerable areas and how to manage the impact of sea level rise on existing communities and developments which are threatened by storm surge and erosion. Previous research has established methodologies for addressing these issues and a number of case study projects have tested the methods, yielding important analyses of risk, costed strategies and intervention scenarios as well as future policy development. These case studies have involved several settlements in regional locations on the South Australian coast.

Urban Heat Prediction and Mitigation

Researchers in this area have developed an urban micro-climate model CAT in collaboration with Ben Gurion University of the Negev, Israel. The model predicts hourly air temperature in an urban street canyon for extended periods in a variety of weather conditions, on the basis of meteorological time series recorded at an open site exposed to the same meso-scale conditions, taking into account the geometry of the two sites and the thermal properties of their respective surface materials. The impact of urban heat on energy use in office buildings in Adelaide CBD was investigated in research with School of Environment, Flinders University (funded by Department of the Premier and Cabinet University Sector Agreement Fund on Climate Change, and Adelaide City Council, 2011-2012).

Sustainable mobility corridors and spatial design

Phenomena associated to urban mobility at the metropolitan scale are becoming particularly relevant in the management of transformative change in environmental planning, spatial renewal and lifestyle behaviours as cities move towards more sustainable and socially equitable development. This research looks at the great potentials associated with the development or upgrade of public transit corridors as drivers of spatial, environmental and economic benefits through the analysis of Australian and European case studies. The research is developed in collaboration with ENSAS (Ecole Nationale Supérieure d'Architecture de Strasbourg) in the

framework of the French interdisciplinary research program: "Ignis mutat res - Looking at Architecture, the City and the Landscape through the Prism of Energy".

Ecological approach to urban design and urban landscapes

This applied research project is aimed at defining a conceptual framework and a methodology for a holistic approach to urban design with a particular focus on integrated water management and urban ecology. Through a multi-disciplinary approach the project focuses on investigating the existing urban systems and the practical implication deriving from the application of green infrastructures models and patterns to urban design, including: urban ecological design, climate sensitive urban design, urban consolidation and land recycling, optimization of existing infrastructure, new energy paradigms, sustainable mobility, local communities sustainable development.

Age-friendly Built Environment

This new inter-disciplinary research (with health sciences, social sciences, and computer sciences) focuses on (1) investigating whether existing built environment, including urban/public spaces and buildings, is age-friendly, and (2) developing planning and design strategies to support older people to age well and remain independent for longer, with quality and preferably in their preferred environment. The initial research has been funded by DVCR Interdisciplinary research funding. Pilot projects are currently on-going involving industry partners including a hospital, age care provider and commercial building developers.

Productive Landscape and Urban Agriculture

This interdisciplinary project is researching how to make the South Australia agro-ecosystems more productive, globally competitive and efficient in producing high quality, innovative, safe and sustainable food while protecting vital natural and cultural assets, assist local communities to articulate plans for their landscapes, and inform sustainable rural planning on the urban fringe. In addition the research aims to determine the landscape management implications of classifying the Mount Lofty Ranges agrarian landscape under UNESCO World Heritage (WH) listing, focusing on the definition of a methodology to examine and map the bio-cultural diversity values of peri-urban productive landscapes across metropolitan regions. This program has been supported by DEWNR, Faculty of Professions IMDR and, MGVWTA and Council of Onkapinga.

Housing and Urban Health and Wellbeing

The Housing and Urban Health and Wellbeing Program of Research aims to contribute robust causal evidence on housing's role (across affordability, quality, location, and adequacy) in promoting health and wellbeing and maximising social and economic participation in Australia. This Program has been well supported by the ARC (DP120102974, LP100200182, FT140100872) and utilises longitudinal and administrative datasets, spatial analysis, econometric modelling as well as qualitative data to provide evidence on the causal role of housing in limiting the health and wellbeing of Australians. In addition to contributing to the evidence base, this research stream aims to contribute to national and policy debate. We actively collaborate with government and non-government organisations and researchers in Australia, the UK, and New Zealand.

Building and Construction Research

Grounded in building science, building construction and qualitative post-occupancy analysis, this established research area focuses on sustainable building and building practices, with particular regard to energy and comfort in buildings, the simulation and analysis of urban micro-climate, and technical and behavioural aspects of 'green' building and infrastructure design.

Human Thermal Comfort

Our research focuses on investigating human thermal comfort in occupied buildings instead of in a thermal comfort chamber because we are more interested in finding out actual people's thermal comfort and how it may be different from predicted or standards. Researchers were also involved in investigating thermal comfort in naturally ventilated houses in South Australia during hot weather in an NCCARF project, led by UniSA, in developing a framework for adaptation Australian households to heat waves. Recent studies in this area include investigation of thermal comfort in atypical house constructions (supported by CSIRO) and in the homes of ageing people (partially funded by AHURI).

Post-Occupancy Evaluation and Sustainability Assessments

Post-occupancy evaluation (POE) is required to test whether a building performs as designed and predicted. Researchers have conducted numerous POEs of houses (ARC Discovery DP0210962) and large buildings. Recent doctoral research compared the performance of Green Star (GS) rated office buildings and non Green Star rated buildings, and demonstrated that despite the fact GS rated buildings used less energy and water than their counterparts, the perceived thermal comfort, health and productivity in the former buildings are not necessarily better than the latter buildings.

Building Performance Simulation

Building simulation is a powerful way to predict the performance of a building (eg. thermal, visual, acoustical) during the design process which potentially save the operating costs once the building is constructed and operated. Researchers have been working in this area for many years and involved in the development of building energy simulation programs such as CHENATH in Australia, EnerWin and EnerRate (with Texas A&M University) as well as development of a new approach within the existing home energy rating scheme by using AccuRate to rate atypical constructions.

Sustainable Construction Practices

Researchers in this field have developed conceptual frameworks, pathways and model to achieve sustainable construction practices via behavioural changes. These include the waste minimization via a cultural shift towards a zero waste approach to sustainable building design, construction and operation (LP110100156 with UniSA), involving a change in the disparate and often fragmented culture(s) throughout design, construction and operation; the need for a more extensive involvement of expertise across the lifecycle of the project; and a consistent approach to innovations and advances in related technologies. The recommendations have been envisioned for use as a mixture of top down and bottom up approaches where most appropriate to positively influence the inhibiting or detrimental cultures identified by the research.

Waste reduction system in construction industry

Funded by the National Natural Science Foundation of China the research focuses on the collaboration mechanism

and evolution mode of the waste reduction system in the construction industry. The stakeholder engagement and collaboration are foci of this grant which aims for achieving the win-win solution for all parties involved via a complex system dynamics approach.

Renewable energy technological innovation

The research looks at the social acceptance of renewable energy technological innovation in buildings, green features and products; and the complex relationship between corporate sustainability and corporate strategy. Similarly, the sustainability issues of building projects at the programme level were examined. These projects are funded by the Ministry of Education of China, and the National Natural Science Foundation of China.

Cross Cultural: Asian and Middle-Eastern Research

Researchers associated with the School's Centre for Asian and Middle-Eastern Architecture (CAMEA) have long-established and maintained a leading stake in Australasia in historical, theoretical and cultural inquiry addressing the critically significant relationships between cultural beliefs and practices and the meanings and spatial order reflected and reproduced in architectural forms and urban cultures.

JAPAN AND EAST ASIA

Culture-led Regional Revitalisation

With a declining population and over two decades of economic flat-lining, a rich panoply of initiatives to mitigate or reconsider economic and demographic decline has been developed in Japan. This line of research investigates the use of cultural means and resources as a key element in revitalisation strategies for declining communities, with a focus on the strategies and effects of architectural and architectonic interventions. Ongoing research has surveyed the proliferation of regional festivals involving international and metropolitan-based cultural producers as a conscious place-making strategy bolstering local identity and driving cultural tourism and inward investment. Particular initiatives with established research engagements include the Echigo-Tsumari Art Field in Niigata Prefecture, and the Setouchi Triennale in the Seto Inland Sea region, supported through the JSPS "Kakenhi" program, the major government funding body for scientific research in Japan.

Discourses and Theories of Contemporary Japanese Architecture

Contemporary architects in Japan are globally active and highly acclaimed for their innovative contributions to the discipline of architecture, with numerous Pritzker Prizes and an influential presence in major international exhibitions of contemporary architecture, such as the Venice Biennale. The research contributes to the interpretation, understanding, and engagement of the discourses and theories underlying contemporary architectural innovation in Japan, through assessment and critical evaluation of specific works and projects, interpretations of the thought and bodies of work of particular architects, and syntheses of the above into contributions to broad surveys of contemporary tendencies, often in the form of exhibitions in major museums and cultural institutions around the globe. Recent work includes contributions to the Inaugural Chicago Architecture Biennale in 2015 and an exhibition of contemporary Japanese architecture at MoMA, New York in 2016.

Transformations in Urban Form and Public Space in East Asia

This area of research has expanded from its specific focus on urban rail in Tokyo to encompass the broad relations between technological infrastructures of transport and communication and urban space, particularly spaces of social interaction and public appearance. Recent work in this research has resulted in contributions to international conferences and thematically-specific journals on urban issues in Japan. It is expected that this research direction, with its emphasis on socio-cultural readings of technological change as manifested in urban space, will continue to develop new areas of focus and application in Australian cities.

SOUTH AND SOUTH EAST ASIA

Modern and Contemporary Architecture in India/South Asia

The modern architecture, planning and nation-building efforts that took place in India following the country's independence in 1947 are widely regarded as exemplary of the internationalization of modernism in the mid-twentieth century through the works by the most important modernist masters, Le Corbusier and Louis Kahn, and others. Architectural practice in India continues to reflect on this rich heritage of international and indigenous modernities, as India assumes its place as an important player in the current global economic climate. The research in this area focuses on this longer history of modern India, from the colonial times until now, to expound the relationship between the changing socio-political context and its manifestations within the architectural realm. Key outputs include India: Modern Architectures in History (Reaktion Books, 2015) and three previous books on the colonial and contemporary architectural history and theory of South Asia.

Transnational Networks of Exchange in the Architectural and Settlement Histories of Asia and Australia

Original CAMEA-based research in this area has focused on the export of Australian architectural education and expertise through the multi-lateral professional and industrial networks that were created by Australia's leadership in the Cold War Era Colombo Plan for Technical cooperation with postcolonial South and Southeast Asia. In collaboration with partner investigators in the South Australian Museum and International Islamic University, CAMEA is also leading a current ARC Linkage project investigating the architecture and broader impact on colonial settlement history of the 'Afghan' cameleers in Australia. The research examines a diverse range of heritage listed houses, urban and remote mosques, business premises, cemeteries, and date plantations in South Australia, Western Australia and Queensland, to reveal the place of "Afghans" in the social and economic fabric of the city and the nation.

MIDDLE EAST

Islamic History, Art, Architecture and Landscape

This area of research includes four intersecting lines of study: 1) history and theory of Islamic art, architecture, and landscape, both traditional and contemporary; 2) pre and early modern Islamic intellectual history; 3) early modern socio-urban history of Middle Eastern cities; and 4) history of Islamic science in the post-Copernican period. This research capacity has been built within the Centre for Asian and Middle Eastern Architecture (CAMEA), has attracted 19 HDR candidates over the past 15 year (10 completed), three ARC Discovery grants, and one ARC DORA Fellowship.

Design and Practice Based Research

Research is based on critical, historical, and ethnographic methodologies, creatively applied and elaborated through engagement on concrete projects. The pursuit of creative design activity also strengthens design expertise, and provides a basis for innovation in design and practice processes.

The Roles and Relationships of Design Practitioners and Government

Design practitioners have a long history of work with political leaders, their parties and supporters, whether embedded within the public service or as consultants. In recent years Adelaide has demonstrated many of the trends being explored both by governments and by practitioners internationally, through initiatives such as the Integrated Design Commission, Office of Design and Architecture SA and the State's first Government Architect. This research focuses on questioning and understanding what responsibilities built environment designers have to better articulate and manage shifting views of civic life and public expectations for the use of shared physical environments. Projects include reviews of multi-layered, inter-government legislation affecting parks at all scales, including specific opportunities for the proposed Adelaide International Bird Sanctuary and development of future urban design and open space in relation to driverless vehicles.

Public Space and Public Art

Through a range of award-winning built projects including competition work and competitive tendering, this research investigates the shifting role and power of landscape architecture in shaping the public realm and contributing to focused discourse on a variety of contested understanding of 'civic' space in contemporary urban environments. Specific projects have tackled the place of sculpture (*helmet* – Heide Museum of Modern Art winning competition entry and award-winning built work), the role of the designer as curator and legislator (*The Rundle Project* award-winning ACC commission), and the efficacy of small urban insertions (*Mrs Robinson* Adelaide bicycle racks) as well as site-historic-specific master planning (*The Route Followed*, the former Northfield airstrip).

Urban Densification, City Fabric and Architectural Form

Aiming at a more sustainable model of urban growth, this research investigates the relationships between an existing city fabric and a secondary layer of architectural form. It develops design strategies that tap into local histories and voices (including those of the seemingly inanimate - the architecture itself and the ground it sits upon) to inform the site related production of architectural character and space.

Emotional Intelligence and the Poetics of Architecture

The research investigates the role of the 'unreasonable' in the design process, demonstrating how a specific artistic context of discovery, based on emotional intelligence, can be linked with a rational and consensus-based approach of justification. The research succeeds in showing how 'unreasonable' processes can lead to the creation of intentional work supported by a substantiated method and quantifiable parameters.