LIVING SYSTEMS AND MICRO-UTOPIAS: 
TOWARDS CONTINUOUS DESIGNING

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ABOUT CAADRIA

The Association for Computer-Aided Architectural Design Research in Asia (CAADRIA) promotes teaching and research in CAAD in the wider Australasian region, and has members on six continents.

CAADRIA was founded in 1996 with the following objectives:
- To facilitate the dissemination of information about CAAD among Australasian schools of architecture, planning, engineering, and building sciences
- To encourage the exchange of staff, students, experience, courseware, and software among schools
- To identify research and develop needs in CAAD education and to initiate collaboration to satisfy them
- To promote research and teaching in CAAD that enhances creativity rather than production

CAADRIA organizes among others annual conferences, the first of which was held in 1996 in Hong Kong. Since then, 20 conferences have been held in Australia, China, Hong Kong, India, Japan, Korea, Malaysia, Singapore, Taiwan, and Thailand. The 21st conference in 2016 is held at The University of Melbourne, Australia. The conferences provide an opportunity for teachers, students, researchers, and practitioners to meet each other and learn about the latest research in the field compiled under a unique theme reflecting the state-of-the-art research and undertakings in the field. The proceedings of the conferences are available both online and in research libraries around the world.

CAADRIA is one of the four founding organizations of the International Journal of Architectural Computing (IJAC), and co-edits one issue each year. IJAC is published by Multi-Science in both paper and electronic versions.

Teng-Wen Chang
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Today, human activities constitute the primary environmental impact on the planet. In this context, commitments to sustainability, or minimization of damage, prove insufficient. To develop regenerative, futuring\(^1\) capabilities, architectural design needs to extend beyond the form and function of things in contained projects and engage with the management of complex systems. Such systems involve multiple types of dynamic phenomena – biotic and abiotic, technical and cultural – and can be understood as living. Engagement with such living systems implies manipulation of pervasive and unceasing change, irrespective of whether it is accepted by design stakeholders or actively managed towards homeostatic or homeorhetic conditions. Manipulation of continuity requires holistic and persistent design involvements. In other words, “designers should become the facilitators of flow, rather than the originators of maintainable ‘things’ such as discrete products or images.”\(^2\)

Responding to this challenge, CAADRIA 2016 seeks to interrogate the notion of continuity and the applicable architectural toolsets in order to map and discover opportunities for innovation. Can architecture utilize computing to dynamically specify services and allocate resources to control flows of matter, energy, money or people?\(^3\) Can architecture overcome the impossibility of perfect design by focusing on the co-emergence of technical systems and their user communities? Can it extend and radicalize the idea of lifecycle management, for example towards the inclusion of non-human stakeholders?

Engagement with complex dynamic systems poses difficult conceptual, technical and ethical challenges. To mention but a few: How can the longevity of living systems be affected through technologies for the capturing

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and sharing of knowledge, including BIM, APIs or technical standards? How do living systems equip and curtail design action, for example through interactions in creative programming, open hardware and parametric modelling communities? How does stabilization of technical knowledge in data types, algorithms, computational objects, languages or user interfaces affect the capability of designers to imagine alternative futures? Can modelling and simulation tools of architectural design cope with the inherent unpredictability of complex systems by integrating such approaches as big data analysis or pervasive computing? Can advances in fabrication and mechatronics support design that functions analogously with the mechanism that evolutionary biologists call adaptive niche construction? What educational approaches are appropriate and future-ready in a world of global and accelerating change? This list of questions could be readily extended.

Crucially, research into more holistic, ecological approaches to architectural design must overcome a methodological mismatch of spatial, temporal and organizational scales. The ecologies of real-world living systems are incalculably more extensive than the bounded experimental prototypes that are possible in research and education. What strategies and technologies can be employed to overcome this dilemma?

CAADRIA 2016 proposes to interrogate whether and how designers’ capacity to create micro-utopias\(^2\) can illuminate or redirect complex, longer-term processes and probe into alternative futures. Examples of relevant methods include, but are not limited to, critical making\(^4\) and critical technical practice\(^5\), interrogative\(^6\), critical and speculative design\(^7\) and wild or feral computing\(^8\).

CAADRIA 2016’s theme of **Continuous Designing** offers a viewpoint for interrogation of all research in design and computation, including, for example: theory, philosophy and methodology of design research; education; collaborative and interdisciplinary design strategies; stakeholder participation; design innovation and creativity; generative, parametric and evolutionary design; visualisation, virtualisation modelling, simulation and prediction; city,


site and building information modelling; human-computer interaction; ubiquitous and pervasive computing; sensing; artificial autonomy and intelligence; mechatronics; fabrication, construction, optimization, mass customisation, and others.

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