INTELLIGENT & INFORMED

C A A D R I A 2 0 1 9

Program of the 24th Annual Conference of the Association for Computer-Aided Architectural Design Research in Asia
April 15th-18th

CONFERENCE PROGRAMME
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### DAY 1
MONDAY, APRIL 15 2019

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<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
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</thead>
<tbody>
<tr>
<td>8:30 - 17:00</td>
<td>FACULTY OF ARCHITECTURE AND DESIGN</td>
<td>ATRIUM</td>
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<tr>
<td>9:00 - 9:30</td>
<td>REGISTRATION, POSTERS &amp; EXHIBITION</td>
<td>ATRIUM</td>
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<tr>
<td>9:30 - 10:30</td>
<td>OPEN CEREMONY - MIHI &amp; WELCOME</td>
<td>ATRIUM</td>
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<tr>
<td>10:30 - 10:45</td>
<td>KEYNOTE 1: Prof Philip Beesley</td>
<td>Diffusive Architecture: Pluripotency &amp; Entropy</td>
</tr>
<tr>
<td>13:00 - 14:00</td>
<td>BREAKFAST, POSTERS &amp; EXHIBITION</td>
<td>ATRIUM</td>
</tr>
<tr>
<td>14:00 - 16:00</td>
<td>SESSION 1A: Artificial Intelligence &amp; Machine Learning</td>
<td>LT1</td>
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<td></td>
<td>SESSION 1B: Generative, Algorithmic &amp; Evolutionary Design/Techniques 1</td>
<td>LT2</td>
</tr>
<tr>
<td></td>
<td>SESSION 1C: Smart Buildings/Cities/Regions 1</td>
<td>VS2.04</td>
</tr>
<tr>
<td></td>
<td>SESSION 1D: Building/City/Region Information Modelling/Management 1</td>
<td>VS3.18</td>
</tr>
<tr>
<td></td>
<td>PGSC 1</td>
<td>VS1.25</td>
</tr>
<tr>
<td>18:30 - 21:00</td>
<td>EXHIBITION OPENING &amp; RECEPTION</td>
<td>ATRIUM</td>
</tr>
</tbody>
</table>

**Waiata** To be sung at the opening ceremony

- **TE AROHA** (LOVE)
- **TE WHAKAPONO** (FAITH)
- **ME TE RANGIMARIE** (AND PEACE)
- **TATOU TATOU E** (BE AMONGST US ALL)
# DAY 2

**TUESDAY, APRIL 16 2019**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>8:30 - 17:00</td>
<td>FACULTY OF ARCHITECTURE AND DESIGN</td>
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<tr>
<td>8:30 - 9:00</td>
<td>REGISTRATION, POSTERS &amp; EXHIBITION ATRIUM</td>
</tr>
<tr>
<td>9:00 - 9:30</td>
<td>AWARDS CEREMONY LT1</td>
</tr>
<tr>
<td></td>
<td>YCA &amp; Best Paper</td>
</tr>
<tr>
<td>9:30 - 10:30</td>
<td>KEYNOTE 2 LT1</td>
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<tr>
<td></td>
<td>Prof Chris Speed</td>
</tr>
<tr>
<td>10:30 - 11:00</td>
<td>MORNING TEA, POSTERS &amp; EXHIBITION ATRIUM</td>
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<tr>
<td>11:00 - 13:00</td>
<td>SESSION 4A LT1</td>
</tr>
<tr>
<td></td>
<td>Theory, Philosophy and Methodology 1</td>
</tr>
<tr>
<td>13:00 - 14:00</td>
<td>SESSION 4B LT2</td>
</tr>
<tr>
<td></td>
<td>Digital Fabrication &amp; Construction 1</td>
</tr>
<tr>
<td>14:00 - 16:00</td>
<td>SESSION 4C VS2.04</td>
</tr>
<tr>
<td></td>
<td>Smart Buildings/Cities/Regions 4</td>
</tr>
<tr>
<td>16:00 - 16:30</td>
<td>SESSION 4D VS3.18</td>
</tr>
<tr>
<td></td>
<td>Building/City/Region Information Modelling/Management 3</td>
</tr>
<tr>
<td>16:30 - 18:10</td>
<td>AFTERNOON TEA, POSTERS &amp; EXHIBITION ATRIUM</td>
</tr>
<tr>
<td>16:00 - 18:10</td>
<td>SESSION 6A - ROUND TABLE 2 LT1</td>
</tr>
<tr>
<td></td>
<td>Accelerating Impacts of Computational Design</td>
</tr>
<tr>
<td>16:30 - 18:10</td>
<td>SESSION 6B LT2</td>
</tr>
<tr>
<td></td>
<td>Digital Fabrication &amp; Construction 3</td>
</tr>
<tr>
<td>18:30 - 21:00</td>
<td>SESSION 6C VS2.04</td>
</tr>
<tr>
<td></td>
<td>Design Cognition 1</td>
</tr>
<tr>
<td></td>
<td>CONFERENCE DINNER WHAREWAKA FUNCTION CENTRE</td>
</tr>
<tr>
<td></td>
<td>Wharewaka Function Centre, Wellington Waterfont</td>
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**Leadership Meeting, Open to Anyone**
**DAY 3**  
WEDNESDAY, APRIL 17 2019

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
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<tr>
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<td>FACULTY OF ARCHITECTURE AND DESIGN</td>
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<tr>
<td>8:30 - 9:30</td>
<td>REGISTRATION, POSTERS &amp; EXHIBITION ATRIUM</td>
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<tr>
<td>9:00 - 9:30</td>
<td>CAADRIA AGM LT1</td>
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<tr>
<td>9:30 - 10:30</td>
<td>KEYNOTE 3 LT1</td>
</tr>
<tr>
<td></td>
<td>Justyna Karakiewicz</td>
</tr>
<tr>
<td>10:30 - 11:00</td>
<td>MORNING TEA, POSTERS &amp; EXHIBITION ATRIUM</td>
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<tr>
<td>11:00 - 13:00</td>
<td>SESSION 7A LT1</td>
</tr>
<tr>
<td></td>
<td>Simulation &amp; Analysis</td>
</tr>
<tr>
<td>11:00 - 13:00</td>
<td>SESSION 7B LT2</td>
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<tr>
<td></td>
<td>Virtual/Augmented/Mixed/Interactive Environments 1</td>
</tr>
<tr>
<td>11:00 - 13:00</td>
<td>SESSION 7C VS2.04</td>
</tr>
<tr>
<td></td>
<td>Design Cognition 2</td>
</tr>
<tr>
<td>11:00 - 13:00</td>
<td>SESSION 7D VS3.18</td>
</tr>
<tr>
<td></td>
<td>Practice &amp; Interdisciplinarity 1</td>
</tr>
<tr>
<td>13:00 - 14:00</td>
<td>LUNCH, POSTERS &amp; EXHIBITION ATRIUM</td>
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<tr>
<td>14:00 - 16:00</td>
<td>SESSION 8A LT1</td>
</tr>
<tr>
<td></td>
<td>Human - Computer Interaction // Collaborative &amp; Collective Design</td>
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<tr>
<td>14:00 - 16:00</td>
<td>SESSION 8B LT2</td>
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<tr>
<td></td>
<td>Virtual/Augmented/Mixed/Interactive Environments 2</td>
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<tr>
<td>14:00 - 16:00</td>
<td>SESSION 8C VS2.04</td>
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<tr>
<td></td>
<td>Design Cognition 3</td>
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<tr>
<td>14:00 - 16:00</td>
<td>SESSION 8D VS3.18</td>
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<tr>
<td></td>
<td>Practice &amp; Interdisciplinarity 2</td>
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<tr>
<td>16:00 - 16:30</td>
<td>AFTERNOON TEA, POSTERS &amp; EXHIBITION ATRIUM</td>
</tr>
<tr>
<td>16:30 - 17:10</td>
<td>CAADRIA CLOSING LT1</td>
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**DAY 4 TOUR**  
THURSDAY, APRIL 18 2019

<table>
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<tr>
<th>Time</th>
<th>Activity</th>
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<tbody>
<tr>
<td>8:45 - 19:00</td>
<td>TIMELINE</td>
</tr>
<tr>
<td>8.45</td>
<td>Meet in Atrium</td>
</tr>
<tr>
<td>9.00</td>
<td>Departure</td>
</tr>
<tr>
<td>9.20</td>
<td>Futuna Chapel</td>
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<tr>
<td>10.00</td>
<td>Depart Futuna Chapel</td>
</tr>
<tr>
<td>10.20</td>
<td>NZ Parliament</td>
</tr>
<tr>
<td>11.30</td>
<td>Depart Parliament and walk to Old St Pauls</td>
</tr>
<tr>
<td>11:40</td>
<td>Old St Pauls</td>
</tr>
<tr>
<td>12.15</td>
<td>Depart Old St Pauls</td>
</tr>
<tr>
<td>12:30</td>
<td>Victoria Lookout</td>
</tr>
<tr>
<td>13:00</td>
<td>Depart Victoria Lookout</td>
</tr>
<tr>
<td>13:15</td>
<td>Lunch at Oriental Parade</td>
</tr>
<tr>
<td>14.00</td>
<td>Walk along the waterfront to Te Papa</td>
</tr>
<tr>
<td>14:15</td>
<td>Te Papa National Museum</td>
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<tr>
<td>15.30</td>
<td>Depart Te Papa and walk along Cuba Street</td>
</tr>
<tr>
<td>17.00</td>
<td>Meet at Southern Cross for drinks and nibbles</td>
</tr>
</tbody>
</table>
The Faculty of Architecture and Design at Victoria University of Wellington combines two schools—the School of Architecture and the School of Design. It offers students a unique opportunity to study within a multi-disciplinary environment. Located in New Zealand’s creative capital, Wellington, we attract the best and brightest from all over the world.

The Faculty is the leading provider of innovative education and offers an extensive range of degrees that cater for the creative sector that explore contemporary design and innovative approaches, through courses tailored to meet current and future trends within the creative design industries.
Diffusive Architecture: Pluripotency and Entropy

This presentation offers a particular kind of form language rooted intimately within our bodies. I argue for the use of diffusive and dissipative forms in architectural design. Building with this renewed language, a series of immersive built installation projects will be illustrated, designed by the author in collaboration with multiple disciplines of the Living Architecture Systems Group. This approach stands distinctly against the Modern preference for stripped, minimal stages devoted to autonomous, objective freedom. Instead of autonomy, the language I argue for pursues tangible and unapologetically emotional involvement. In this discussion I will search for renewed kinds of emplacement, pursuing relationships affording subtle phenomena and expanded physiologies, embodying the forms of diffusion and dissipation. These projects approach living qualities.

Qualities from biology will be used as examples for this new kind of architecture. A strikingly new conception that seems to counter the assumption that life depends on resisting decay and disorder was offered by the physicist Ilya Prigogine in his 1978 Nobel address. Dissipative forms might seem ephemeral, but they are in fact tenacious and durable, holding their organizations in dynamic balance while at the same time materials and energy constantly cycle through them.

The qualities evoked by these renewed conceptions can be seen within a series of new projects by the Living Architecture Systems Group. This collaborative research and design group is pursuing precarious, reactive qualities designing systems that maintain durability and coherence while at the same time generating entropy.

The structural mesh of recent LASG projects employs overlapping strands within hexagonal pyramid cells that possess strength in minimal material. The structure is made up of a series of lightweight meshwork spherical shells that arc high above occupants, making simple shelters. The shells use thermally formed acrylic, using digitally fabricated cutting patterns that permit stretching into deeply elongated hollow doubly-curved trumpet-shaped cells whose skeletal patterns have been optimized for production with minimal waste.

Component designs within these scaffolds tend to be skeletal in form, created by orienting vertices within each component cell where elements need to intersect with neighbouring cells and carry internal component details, and by drawing vectors between those points. In contrast to rigid frames, the assembled scaffolds that result tend to resemble natural tensegrity-based systems.

Tile-shaped components used for covering these structures and for stirring and propelling air movements are designed for 'precarious' highly reactive behaviors. By drawing on physical examples of coupled interactions and interconnections, a renewed kind of unapologetically fragile architecture can be found.

SPEAKER BIOGRAPHY

Professor Philip Beesley (Canadian, born 1956) is a multidisciplinary artist and architect. Beesley's research is globally acclaimed for its pioneering contributions to the rapidly emerging field of responsive interactive architecture. He directs Living Architecture Systems Group (LASG), an international consortium of researchers, creators, and industry partners developing far-reaching experimental architecture. LASG explores bold questions such as whether architecture can integrate living functions and future buildings could think and care. Its immersive installations provide a unique combination of expertise in architecture, environmental design, visual art, digital media, engineering, machine learning, cognitive psychology, synthetic biology and knowledge integration. Collaborations with LASG artists, scientists, and engineers has led to a diverse array of projects, from haute couture collections to complex electronic systems that can sense, react and learn.

Beesley is a Professor at the School of Architecture at the University of Waterloo and Professor of Digital Design and Architecture & Urbanism at the European Graduate School. He represented Canada at the 2010 Venice Biennale of Architecture. He has authored and edited numerous books and proceedings, and has frequently been featured in Canadian and international media, including Vogue, WIRED, Artificial Life (MIT), LEONARDO, CBC, and a series of TED talks.

Instagram – @lasg_research
Designing New Socio-Economic Imaginaries

What happens when we give physical things wallets containing digital currencies? How can this alter power relationships and shift social dynamics? Chris Speed will explore these questions by highlighting the use of smart contracts in design, from a coffee machine that lets you vote for your coffee bean and pays those who clean it, to a hairdryer that trades on the energy market to offer the best price for drying your hair. The talk will frame these design prototypes as forms of ‘apocalyptic design’, a term borrowed from the genre of ‘apocalyptic cinema’ that foretell an end to the world. Recovering Franklin Ginnn’s analysis of the Hungarian film ‘The Turin Horse’ in which we see how the animals, artefacts and environments all hold a more-than-human power over the destiny of a community. From a disobedient horse which infuriates its master, to paraffin that rejects its propensity to light when it encounters the flame, we find an alternative ontological framework in which a ‘society of objects’ is counter to one in which humans should expect control. If we extend Tarr’s thesis, the smart city that digital architects crave may be one in which ‘things’ decided to reject a future in which humans thrive, in favour of one in which artefacts and living things and can live for as long as possible.

Design is increasingly adopting a more-than-human position in order to better understand the limitations of human-centred perspectives that marginalise other living and non-living actors. By introducing projects that disrupt human agency, Chris will explore how ‘apocalyptic design’ case studies for the Centre for Design Informatics reconfigure human and more-than-human relations, and rebalance the use of agency away from the user.

SPEAKER BIOGRAPHY

Chris is Chair of Design Informatics at the University of Edinburgh where he collaborates with a wide variety of partners to explore how design provides methods to adapt, and create products and services within a networked society. He is especially favours transgressive design interventions, to help identify and promote the values we care about most, including coffee machines that order their own ethical supplies, hair dryers that ask you to wait for the right time to blow dry your hair, and apps for sham marriages. His interest in digital architectures stems from his PhD: A Social Dimension to Digital Architectural Practice (2007) and accounted for a large body of work that developed real-time data visualizations to describe the social representation of buildings and communities. More recently, the development of the bespoke GPS app Comob Net to represent social networks, and the use of Ethereum to author smart contracts for public spaces has led to research questions about how data is changing urban imaginaries.

Chris is co-editor of the journal Ubiquity and co-directs the Design Informatics Research Centre that is home to a combination of researchers working across the fields of interaction design, temporal design, anthropology, software engineering and digital architecture, as well as the PhD, MA/MFA and MSc and Advanced MSc programmes.
As designers, our decisions have implications. We know now that what we build has future implications in ways that are profound. When we define design as problem solving, we ignore the truth that design is problem making.

Using my work to illustrate these ideas, I will also show how computational approaches have complimented my underlying approach to design through drawing.

SPEAKER BIOGRAPHY

Professor Justyna Karakiewicz researches urban design and architecture through design in practice globally and by publication, including numerous design awards and an extensive record of exhibitions. Her work in sustainability was recognised by the Royal Institute of British Architects in 2008 in the Housing Design Awards 2008 Historic Awards for the design of Spinney Garden, constructed in 1986. Her book Promoting Sustainable Living: Sustainability as an Object of Desire, (Routledge, 2015) and Making of Hong Kong: From Vertical to Volumetric (Routledge, 2011) extend her work in this field. Her most recent co-edited book, Urban Galapagos: Transition to Sustainability in Complex Adaptive Systems in the Springer Social and Ecological Interaction in the Galapagos Islands Series (2019) considers the opportunities in coupled natural urban systems, engaging computer, social and economic sciences with design. She is Professor of Urban Design and Architecture at the University of Melbourne, earned her doctorate at RMIT and earlier degrees from the Architectural Association and Westminster University.
SESSION 1A LT1

Artificial Intelligence & Machine Learning
CHAIR | Kristof Crolla, CUHK

11:15 Optimising Image Classification: Implementation of Convolutional Neural Network Algorithms to Distinguish Between Plans and Sections within the Architectural, Engineering and Construction (AEC) Industry
Jennifer Mei Yee Ng, Nariddh Khean, David Madden, Alessandra Fabbi, Nicole Gardner, M. Hank Haeusler and Yannis Zavoleas
Identifying the Landscape of Machine Learning-aided Architectural Design: A Term Clustering and Scientometrics Study
Tania Papasotiriou
Algorithms, AI and Architecture: Notes on an extinction
Dermott McMeel
Mindful Manifestation: A method for designing architectural forms using brain activities
Duong Nguyen, Tane Moleta and Marc Aurel Schnabel

SESSION 1B LT2

Generative, Algorithmic & Evolutionary Design/Techniques 1
CHAIR | Tom Kvan, Melbourne School of Design

Jaejong Lee, Yasushi Ikeda and Kensuke Hotta
Agent-driven Accessibility and Visibility Analysis in Nursing Units
Jisun Lee and Hyunsoo Lee
Influences of a New Digital Cultural Layer on Design at Varying Scales
James Holth, Scott Meekings, Marc Aurel Schnabel and Tane Moleta
Building Intelligence Through Generative Design: Structural Analysis and Optimisation Informed by Material Performance
Ryan Johan, Michael Chernyavsky, Alessandra Fabbi, Nicole Gardner, M. Hank Haeusler and Yannis Zavoleas
Integrating User-Behaviour as Performance Criteria in Conceptual Parametric Design
Leyla Deniz Kiraz and Tuba Kocaturk

SESSION 1C VS2.04

Smart Buildings/Cities/Regions 1
CHAIR | Weixin Huang, Tsinghua University

11:15 A Spatial Decision Support Framework For Planning: Creating Tool-Chains for Organisational Teams
Pradeep Alva, Patrick Janssen and Rudi Stouffs
Planting Design by Simulated Competition: A Computational-Ecological Model for the Selection and Distribution of Plant Species on Urban Roof Terraces
Michael White, M. Hank Haeusler and Yannis Zavoleas
Village Heritage Conservation in the New Data Age: Rural Information Modelling in the Context of Rural Vitalization in China
Nan Bai and Lu Wang
Bespoke Tools Providing Solutions for Contemporary Problems: Novel BIM Practice for Architects
Will Wang and Ralph Spencer Steenblik
Context-Aware Mass Customization Construction System: Methods for user captured as-built plans
Filipe JS Brandao and Alexandra Paio

SESSION 1D VS3.18

Building/City/Region Information Modelling/Management 1
CHAIR | Hèrm Hofmeyer, TU Eindhoven

11:15 Functional Fiction to Collective Action: Values-Based Participatory Urban Design Gaming
Hamish Beattie, Daniel Brown and Sara Kindon
Uncertainty and Sensitivity Analysis Using Building Information Modeling: (An Energy Analysis Test Case)
Fatemeh Shahsavari, Rasool Koosha and Wei Yan
Sensitivity analysis of thermal performance of granary building based on machine learning
Zhang Jiaxin, Li Yunqin, Li Haiqing and Wang Xueqiang
Maintaining thermal comfort of a single-sided naturally ventilated model house by intelligently actuating windows
M. K. Pokhrel, T. N. Anderson and T. T. Lie
Can the Use of Stochastic Models of Occupants’ Environmental Control Behavior Influence Architectural Design Outcomes?: How Field Data Can Influence Design Outcomes
Max Marschall and Jane Burry
### SESSION 2A

**Computational Design Education // Digital Conservation & Heritage**

**CHAIR | Bob Martens, Technische Universität Wien**

**14:00**

**Redefining Mixed Reality: User-Reality-Virtuality and Virtual Heritage Perspectives**  
*Mafkereseb Kassahun Bekele and Erik Champion*

The Scholarly Rewards and Tragic Irony of 3D Models in Virtual Heritage Discourse  
*Hafizur Rahaman and Erik Champion*

*Patrick Janssen, Derek Pung and Kian Wee Chen*

Computationally Mapping Spatial Properties of Chinese Historic Towns Using Space Syntax  
*Pan Liao, Ning Gu, Chris Brisbin, Matthew Rofe and Sahar Soltani*

A Critical Framework of Smart Cities Development  
*Victor Caixto, Ning Gu and Gabriela Celani*

Teaching Computational Design and BIM in the age of (semi)flipped classrooms  
*Dominik Holzer*

### SESSION 2B

**Generative, Algorithmic & Evolutionary Design/Techniques 2**

**CHAIR | Yasushi Ikeda, Keio University**

**14:00**

**Pedestrian Dynamic Behaviour Modelling: An Application to Commercial Environment Using RNN Framework**  
*Gen Karoji, Kensisuke Hotta, Akito Hotta and Yasushi Ikeda*

Intelligent Generation of Architectural layout inheriting spatial features of Chinese Garden Based on Prototype and Multi-agent System: A Case Study on Lotus Teahouse in Yixing  
*Chenyi Cai, Peng Tang and Biao Li*

The Influence of Supermarket Spatial Layout on Shopping Behavior and Product Sales: An Application of the Ultra-wideband Indoor Positioning System  
*Lijing Yang, Bingyu Cheng, Nachuan Deng, Zhi Zhou and Weixin Huang*

An Algorithm of Rigid Foldable Tessellation Origami to Adapt Free-form Surfaces  
*Hong-Cing Tung and Pei-Hsien Hsu*

A Computational Approach to Measuring Social Impact of Urban Density through Mixed Methods Using Spatial Analysis  
*Sahar Soltani, Ning Gu, Jorge Ochoa Paniagua, Alpana Sivam and Tim McGinley*

The Study on the Relationship Between Storm Surface Runoff and the Form of Street-block Using the Cellular Automata Model  
*Quan Liu, Xintian Li, Ming Mao, Mengjie Gu and Qingfeng Ye*
SESSION 3A - ROUND TABLE 1  

EDUCATION IN TIME BASED CAAD REALMS  
CHAIR | Tane Moleta, Victoria University of Wellington  
PANEL | Yoann Pencreach, Andre Brown, Christiane Herr, Sky Lo Tian Tian  
16:30 The Round Table will discuss and question computational design education at the end of the second decade of the 21st century. How do we learn, teach and research. What role do computational instruments play, and how do learners gain deep learning? The discussion invites you to take actively part. The Round Table is supported by FORUM8

SESSION 3B  
Generative, Algorithmic & Evolutionary Design/Techniques 3  
CHAIR | Hyyoung-June Park, University of Hawaii at Manoa  
16:30 Adaptive Urban Design Research Based on Multi-Agent System: Taking The Urban Renewal Design Of Shanghai Hongkou Port Area As An Example  
Chunxia Yang, Zhuoxing Guan and Ziying Yao  
Computing Spatial Features to Allocate Collision-free Motion-paths for Tele-presence Avatars  
Urvashi Dwivedi, Valentin Porcellini, Sukjoo Hong, Zhuming chang and Ji-Hyun Lee  
Connecting Computation to Urban Social System: An Application of Agent-Based Model on Simulations of the favela  
Bing Zhao, Zeynab Kasseb and Philip Yuan  
Intelligent Multi-objective Optimization Method for Complex Building Layout Based on Pedestrian Flow Organization: A Case Study of People’s Court Building in Anhui, China  
Yunqin Li, Jiaxin Zhang and Chuanfei Yu  
Effects of 3D Zoning of Spatial Designs on the Performance of Structure Systems  
Hèrm Hofmeyer, Dennis Claessens, Sjonnie Boonstra and Bauke de Vries

SESSION 3C  
Smart Buildings/Cities/Regions 3  
CHAIR | Tomohiro Fukuda, Osaka University  
16:30 A Generative Design Method for the Functional Layout of Town Planning Based on Multi-Agent System  
Ruocheng Zhang, Hanshuang Tong, Weixin Huang and Runzhou Zhang  
Non-standard Housing: Exploring Generative Design Strategies for Differentiated Residential Projects  
Jeroen van Ameijde  
Method for Finding Elements Similar to Those Causing Building Component Failure Based on Building Information Models  
Michio Matsubayashi  
Synthesizing 360-degree Live Streaming for an Erased Background to Study Renovation Using Mixed Reality  
Yuehan Zhu, Tomohiro Fukuda and Nobuyoshi Yabuki  
Co-designing In Social VR: Process Awareness And Suitable Representations to Empower user Participation  
Tomás Dorta, Stéphane Safin, Sana Boudhraâ and Emmanuel Beaudry Marchand
DAY 1 PGSC SESSIONS MONDAY, APRIL 15 2019

PGSC 1 VS1.25
CHAIR | Christiane Herr
PANEL | Anastasia Globa, Rudi Stouffs, Thomas Fischer and Ines Caetano

11:20 Co-Performative Bio-Climatic Layers of Built Environment
   Maria Davidová
11:45 Urban Nodes: Programming Intelligent Spaces for Social Interaction
   Hyunjae Nam
12:10 Using design-based criteria for spatial quality to Improve Temporary Events in Urban Squares
   Hossein Behmanesh
12:35 Virtual Co-design: A Human-centred Urban Spatial Design
   Shuva Chowdhury

PGSC 2 VS1.25
CHAIR | Christiane Herr
PANEL | Rudi Stouffs and Thomas Fischer

14:00 Development of Generating System for Architectural Color Icons
   Yuri Kato
14:30 Performance-based Parametric Design Optimization for Conceptual Architectural Design Exploration
   Likai Wang
15:00 A self-adapting evolutionary framework for structural optimization
   Xin Yan
15:30 Topological Optimization Logical Structure Rules in Multi-agent Systems for Design and Fabrication
   Dingwen Bao

PGSC 3 VS1.25
CHAIR | Thomas Fischer
PANEL | Anastasia Globa and Tom Kvan

16:30 Behaviour modelling in well-being
   Leyla Deniz Kiraz
17:00 An Augmented Reality Application for Medical Students
   Tiara Dobbs
17:30 The Data of Architecture: the material outcomes of socio-technical assemblages
   Chris Bamborough
SESSION 4A  LT1

Theory, Philosophy and Methodology 1
CHAIR | Paul Loh, Melbourne University
11:00  Design Practice Complexity in the Post-digital Age: Theoretical Discussion and Comparative Case Study of Non-standard Building Façades
Sining Wang and Kristof Crolla
Capturing Parametric Design Exploration Process: Empirical insights from user activity and design states data
Verina Cristie and Sam Condrad Joyce
3D Model and Network-based Representation of Japanese Traditional Wooden Building System
Keita Kado and Gakuhito Hirasawa
Design Cybernetics and CAAD Research: Aspects of our Shared Interests
Christiane M. Herr and Thomas Fischer
Triangulated Shell Foam Structures Based on Robotic Hot Wire Cutting: A Design, Geometry Rationalisation and Fabrication Workflow
Thomas Fischer, Christiane M. Herr and Michael Grau

SESSION 4B  LT2

Digital Fabrication & Construction 1
CHAIR | Walaiporn Nakapan, Rangsit University
11:00  Simplifying Doubly Curved Concrete: Post-Digital Expansion of Concrete’s Construction Solution Space
Zion Chan and Kristof Crolla
Back to Reality: Dendritic Structures Using Current Construction Techniques
José Freitas and António Leitão
Fabrication of Ultra-Lightweight Parametric Glass Fiber Reinforced Shell Assemblies
Jonathan Ming-En Ng, Samuel Yu De Ho, Truman Wei Cheng Ng, Jia Ying Soh and Stylianos Dritsas
Knit Preform Shaping: Design of Textile Preform and Edge-shaping mechanism for curved composite panel formation
Ying Yi Tan and Tat Lin Lee
Tailored flexibility: Reinforcing concrete fabric formwork with 3D printed plastics
Jon Engholt and Dave Pigram

SESSION 4C  VS2.04

Smart Buildings/Cities/Regions 4
CHAIR | Andre Brown, VUW
11:00  Bim-based Live Sensor Data Visualization Using Virtual Reality for Monitoring Indoor Conditions
Worawan Natephra and Ali Motamedi
Enhanced Building Services: Smart Fixture Case Studies
Andrzej Zarzycki
Development of Generating System for Architectural Color Icons Using Google Map Platform and Tensorflow-Segmentation
Yuri Kato and Shohei Matsukawa
Communication Framework and Emojis-Danmaku Applied To Cooperation Workshop
Yi-Sin Wu and Teng-Wen Chang
PixelGreen: A hybrid green media wall for existing high-rise buildings
Chin Koi Khoo and H. Koon Wee

SESSION 4D  VS3.18

Building/City/Region Information Modelling/Management 3
CHAIR | Taysheen Jeng, National Cheng Kung University
11:00  Land Price Prediction System Using Case-based Reasoning
Minkyu Choi, Taeha Yi, Meereh Kim and Ji-Hyun Lee
Extracting Different Spatio-semantic Structures from IFC using a Triple Graph Grammar
Helga Tauscher and Rudi Stouffs
A Development of KBIMS-based Building Design Quality Evaluation and Performance Review Interface
Park Hyejin, Gu Hyeongmo, Lee Woojun, Kim Inhan and Choo Seungyeon
Converting KBimCode into an Executable Code for the Automated Design Rule Checking System
Jaeyeol Song, Jinsung Kim and Jin-Kook Lee
Redback BIM: Developing a Browser-based Modeling Application Software Taxonomy
Emily Leung, Andrew Butler, Rob Asher, Nicole Gardner and M. Hank Haeusler
DAY 2 SESSION 5 14:00-16:00 TUESDAY, APRIL 16 2019

SESSION 5A LT1

Theory, Philosophy and Methodology 2
CHAIR | Matias Del Campo, University of Michigan

14:00 Inhabiting the Drawing: 1:1 in Time and Space
Marian Macken, Sarosh Mulla and Aaron Paterson
Flipped: An Interactive Installation Working as Social Catalyst for Social Anxiety Disorder Students
Jie Liu, Weiguo Xu, Jiahui Chang, Hongtao Ma and Qingqing Xu
Computing Architectures: Pedagogical Explorations at the Intersection of Design and Mechanical Computation
Dimitris Papanikolaou
Towards a hybrid Model-making method based on Translations between Physical and Digital models: A Case Study of the Freeform Architectural Design
Dongchen Han, Hong Zhang, Weiwen Cui and Jie Huang
Towards a History of Computational Tools in Automated Architectural Design: the Seroussi Pavilion Competition as a Case Study
Nadja Gaudilliere

SESSION 5B LT2

Digital Fabrication & Construction 2
CHAIR | Justyna Karakiewicz, Melbourne School of Design

14:00 Digital Design and Construction of Lightweight Steel-timber Composite Gridshell for Large-span Roof: A Practice of Steel-timber Composite Gridshell in Venue B for 2018 West Bund World AI Conference
Jinxi Jin, Li Han, Hua Chai, Xiao Zhang and Philip F. Yuan
Experiments in Timber Space Frame Design: Fabrication, Construction and Structural Performance
Gerard Finch, Guy Marriage, Antony Pelosi and Morten Gjerde
Additive Manufacturing with Natural Composites: From Material Intelligence to Informed Digital Fabrication
Stylianos Dritsas, Yadunund Vijay, Ryan Teo, Samuel Halim, Naresh Sanandiya and Javier G. Fernandez
Optimization of Clay Mould for Concrete Casting Using Design of Experiments
Sihan Wang, Zack Xuereb Conti and Felix Raspall
Stereo Lithography with Randomized Aggregates
Elizabeth Teo, Yun Jie Pang, Yu Xie, Pheeraphat Ratchakitprakarn, Rebekah Low and Stylianos Dritsas
Data Informed Branch Typologies for Structurally Optimised Curvilinear Surfaces: 3D Printed Mesh Density System (MDS) as Formwork for Concrete Shell Structures
Maryam Houda and Daniel Dias-da-Costa

SESSION 5C VS2.04

Robotics
CHAIR | Urs Hirschberg, TU Graz

14:00 Exploration of Computational Design and Robotic Fabrication with Wire-Arc Additive Manufacturing Techniques
Yifan Zhou, Liming Zhang, Xiang Wang, Zhewen Chen and Philip F Yuan
Robotic Glass Crafting by Dip Forming
Chi-Li Cheng and Jun-Hao Hou
Innovative Design Approach to Optimized Performance on Large-Scale Robotic 3D-Printed Spatial Structure
Zhewen Chen, Liming Zhang and Philip F. Yuan
Robotic Free-Oriented Additive Manufacturing Technique for Thermoplastic Lattice and Cellular Structures
Manuel Ladron de Guevara, Luis Borunda, Jeremy Ficca, Daragh Byrne and Ramesh Krishnamurti
Airforming: Adaptive Robotic Molding of Freeform Surfaces through Incremental Heat and Variable Pressure
Kyle Schumann and Ryan Luke Johns
Design, Analysis and Robotic Fabrication of a Bending-Active Shell Structure with Thin Sheets Based on Curved-Crease-Folding Technique
Xiang Wang, Zhe Guo, Xiao Zhang, Jinxi Jin and Philip F. Yuan

SESSION 5D VS3.18

Building/City/Region Information Modelling/Management 4
CHAIR | Anastasia Globa, USYD

14:00 From Visual Input to Visual Output in Textual Programming
Maria Sammer, António Leitão and Inês Caetano
Game of Renders: The Use of Game Engines for Architectural Visualization
António Leitão, Renata Castelo-Branco and Guilherme Santos
Digital Aided Facade Design Introduced in a Traditional Design Workflow: An Experience from one Large-scale Museum Design and Construction Practice
Chenlong Ma, Shuyan Zhu and Ke Xiang
Algorithmic Design and Performance Analysis of Adaptive Façades
Helena Martinho, Catarina Belém, António Leitão, Roel Loonen and M. Glória Gomes
Opening BIM in a new dimension: A simple, OpenBIM standards based Virtual reality collaboration technique for BIM
Anirudh Nandavar, Frank Petzold, Gerhard Schubert and Elie Youssef
An Innovative, Hierarchical Energy Performance Data Visualization for Facilitating Recognition of Thermal Issues
Marzieh Imani, Iman Sayah, Brenda Vale and Michael Donn
We see many vibrant computational design communities making tangible contributions to research and practice. They are driving complex form-making while others are more focused on better leveraging building performance to drive design. They impact supply chains through digital fabrication and assembly. Despite much potential impacts in industry remain fragmented, with pockets of excellence dispersed among conventional tools & ways of working.
DAY 3  SESSION 7  11:00-13:00  WEDNESDAY, APRIL 17 2019

SESSION 7A  LT1
Simulation & Analysis
CHAIR | Teng-wen Chang, National Yunlin Uni of Science & Technology
11:00 Reshape: Rapid Forming and Simulation System Using Unmanned Aerial Vehicles for Architectural Representation
Xuhui Lin and Rizal Muslimin

Controlling Daylight Reflectance with Cyber-physical Systems
Chandler Ahrens, Roger Chamberlain, Scott Mitchell, Adam Barnstorff and Joshua Gelbard

From Acoustic Data Perception to Visualization Design
Yao Zhao, Weiran Zhu and Philip F. Yuan

Acoustic Simulation and Conditioning in Vaulted Structures: Faceted Stereotomic Strategies for Multi-listener Spaces
Adam Hannouch

A Computational Workflow for Understanding Acoustic Performance in Existing Buildings
Maia Zheliazkova, Bhargava Ram Kumaramuru and Ingrid Paoletti

Using an online participation tool to collect relevant data for urban design: The construction of two participation exercises
Ludovica Tomarchio, Stephanie Hasler, Pieter Herthogs, Johannes Müller, Bige Tunçer and Peijun He

SESSION 7B  LT2
Virtual/Augmented/Mixed/Interactive Environments 1
CHAIR | Tane Moleta, VUW
11:00 Designing ‘Action trigger’ for architecture modelling design within immersive Virtual Reality
Tian Tian Lo, ZuoPeng Xiao and Henry Yu

FlowMorph: Exploring the human-material interaction in digitally augmented craftsmanship
Soo meinen Hahm, Abel Maciel, Eri Sumitiomio and Alvaro Lopez Rodriguez

Hands on Design: Integrating haptic interaction and feedback in virtual environments for enhanced immersive experiences in design practice.
Daniel Camacho, Tiara Dobbs, Alessandra Fabbrì, Nicole Gardner, M. Hank Haeusler and Yannis Zavoleas

The Well Tempered Environment of Experience: (Neuro)Scientific Methods for Data Collection, Analysis & Visualization
Kristine Mun, Dane Clemenson and Biayna Bogosian

I hear, what you are doing!: workspace awareness in collaborative virtual environments
Gerhard Schubert, Ivan Bratoev, Vadym Strelchenko and Frank Petzold

Integrating UAV Development Technology with Augmented Reality Toward Landscape Tele-simulation
Liang Yan, Tomohiro Fukuda and Nobuyoshi Yabuki

SESSION 7C  VS2.04
Design Cognition 2
CHAIR | Christiane M. Herr, XJTLU
11:00 Augmented Architecture: Interplay between Digital and Physical Environments
Surapong Lertsitichai

Agency of Interactive Space in social relationship
Kristina Boychenko

A Blockchain Approach to Supply Chain Management in a BIM-enabled Environment
Adam Fitriawijaya, Tsai Hsin-Hsuan and jeng Taysheng

Blockchain Grammars: Designing with DAOs: The blockchain as a design platform for shape grammars’ decentralised collaboration
Theodoros Dounas and Davide Lombardi

Reflection in Action: An Educational Indie Video Game with Design Rules
Alice Sandstrom and Hyong-June Park

Space Semantics: An investigation into the numerical codification of space
Sarah Yap, Gloria Ha and Rizal Muslimin

SESSION 7D  VS3.18
Practice & Interdisciplinarity 1
CHAIR | Tom Fischer, XJTLU
11:00 Diversity and Efficiency: A Hybrid Evolutionary Algorithm Combining an Island Model with a Steady-state Replacement Strategy
Likai Wang, Patrick Janssen and Guohua Ji

Designing out Urban Heat Islands: Optimisation of Footpath Materials with Different Albedo Value Through Evolutionary Algorithms to Address Urban Heat Island Effect
Stephen Green, Geoff King, Alessandra Fabbri, Nicole Gardner, M. Hank Haeusler and Yannis Zavoleas

Use of UAV Photogrammetry to Estimate the Solar Energy Potential of Residential Buildings in Severe Cold Region
Yunsong Han, Yongjie Pan, Tianyu Zhao, Chunxing Wang and Cheng Sun

Rui Cao, Tomohiro Fukuda and Nobuyoshi Yabuki

The Future of Environmental Performance Architectural Design Based on Human-Computer Interaction: Prediction Generation Based on Physical Wind Tunnel and Neural Network Algorithms
Yuqiong Lin, Jiawei Yao, Chenyu Huang and Philip F. Yuan

Face-to-face with people in spaces: A method to identify face-to-face interactions using an indoor positioning system
Tiara Dobbs
**SESSION 8A**

*Human - Computer Interaction // Collaborative & Collective Design*

**CHAIR | Mizuho Nishioka, VUW**

**14:00** Reimagining Relativity: Transitioning the physical body into a virtual inhabitant

*Jessie Rogers, Marc Aurel Schnabel and Tane Jacob Moleta*

Harmonielehre’ for Architects: Exploring the relationship between music and architecture by scripting

*Urs Hirschberg*

The Church of AI: an examination of architecture in a posthuman design ecology

*Matias del Campo, Sandra Manninger, Marianne Sanche and Leetee Wang*

Sensory Urbanism and Placemaking: Exploring Virtual Reality and the Creation of Place

*Anastasia Globa, Rui Wang and Beau B. Beza*

**SESSION 8B**

*Virtual/Augmented/Mixed/Interactive Environments 2*

**CHAIR | Sky Lo Tian Tian, Harbin Institute of Technology**

**14:00** Putting the AR in (AR)chitecture - integrating voice recognition and gesture control for Augmented Reality interaction to enhance design practice

*Aron Sheldon, Tiara Dobbs, Alessandra Fabbri, Nicole Gardner, M. Hank Haeusler, Cristina Ramos and Yannis Zavoleas*

Building Simplification: A fabrication method based on Augmented Reality

*Kaijie Qian*

Beyond the Portal: A Study of the Tangible and Intangible Rituals within Sacred Spaces

*Cyrus Qureshi, Tane Moleta and Marc Aurel Schnabel*

The New Mirror: Reflecting on inhabitant behaviour in VR and VR visualisations

*Brandon Wang, Tane Moleta and Marc Aurel Schnabel*

**SESSION 8C**

*Design Cognition 3*

**CHAIR | Patrick Janssen, NUS**

**14:00** The Nature of Data in Early Modern Architectural Practice

*Chris Bamborough*

Machinic Design Inference: from Pokémon to Architecture: A Probabilistic Machine Learning Model for Generative Design using Game Levels Abstractions

*Immanuel Koh, Pedro Amorim and Jeffrey Huang*

Amplifying Citizens’ Voices in Smart Cities: An Application of Social Media Sentiment Analysis in Urban Sciences

*Iman Sayahand and Marc Aurel Schnabel*

Approach to Auto-recognition of Design Elements for the Intelligent Management of Interior Pictures

*Jinsung Kim, Jaeyeol Song and Jin-Kook Lee*

**SESSION 8D**

*Practice & Interdisciplinarity 2*

**CHAIR | Surapong Lertsithichai, Harvard GSD**

**14:00** Intelligent Territory: A responsive cooling tower and shading system for arid environments

*Alina Hramyka, Neil Grewal, Mohammad Makki and Brittany Dillon*

Conflicting goals in Architecture: A study on Multi-Objective Optimisation

*Catarina G. Belém and António Leitão*

Discoverable Desks: Finding location and orientation in a mobile workplace

*Sophie Scott, Ben Doherty, Alessandra Fabbri, Nicole Gardner and M. Hank Haeusler*

Robotic Fabrication of Doubly Curved Façade System: constructing intelligence in the digital fabrication workflow

*Paul Loh, David Leggett and Daniel Prohasky*
The conference is framed by the I & I - Digital Art Exhibition by Faculty members of the Faculty Architecture & Design, VUW.

The exhibition will be officially opened on Monday, 15th April at 18:30.
INHABITING OMNI-ARCHITECTURE
Jessie Rogers, School of Architecture

The artwork presents the generation of new virtual relativity laws, reimagining virtual space inhabitation within an omni-directional environment. Presenting the trilogy of virtual classifications; the virtual inhabitant; the speculative environment; and the virtual built-form, these coalesce, generating a new realm of design within immersive architectural space.

The components within the trilogy are all designed relative to each other following the Interconnective Design Methodology Ecosystem framework, which allowed a high level of complexity and richness to shine through the research and design work. The vital components within the trilogy of virtual classifications are the; Architectural designer's role; Interactivity; Global time; Diachronic time; Environment boundaries; Virtual body; Spatial locomotion; Audio experience; User population; Aesthetic materiality and filters; Geometry; Spatial orientation; Local-scale; Atmospheric filters; Orthogonal; Polygonal; Curved rotational fractals; Minimal surface; and Reveal sequencing.

MACHINETIME_NATURETIME
Mizuho Nishioka, School of Design

MachineTime_NatureTime offers an amendment to the practices of photographic image-making. Nishioka explores how multiple participants might affect their own agency the production of a photograph. Fragments of botanical specimens float suspended in the picture plane inviting us to become immersed in a wind-blown field of petals, leaves, pollen and twigs.

Yet all is not quite as it seems. In allowing wind to move her specimens, the photographer has allowed, what she calls, 'Nature Time' to outpace 'Machine Time'. As she says: The technology for producing the photographic imprint is pushed beyond the limits of its ability to form a complete photographic image and instead offers a more complex map of the relationship between these two worlds. MachineTime_NatureTime enmeshes the familiarity of the botanic and the unfamiliarity of marks made by technological disruption. This representation of normally unseen processes recreates for the artist some of the "moments of great expectation, anticipation and terror" involved in image processing in an era of technological sophistication and seamlessness image making.

RESONANT APPARATUS
Blake Johnston, School of Music

Resonant Apparatus is a composition for a bespoke headset that allows for the audience to experience extraordinary spatial and sonic phenomena. The headset consists of two loudspeakers, which sit on the ears like normal headphones, and two surface transducers that sit on the cheekbones of the wearer. These transducers vibrate the cheekbones and skull of the wearer, allowing for the experience sounds seemingly emanating from within the head.

The work investigates the creative and experiential affordances of the bespoke headset by placing the listener's head as the site of exploration, creating sounds that move around and inside the listener's body. The work employs binaural techniques to create hyper-realistic sonic environments with convincing spatial-morphological qualities. These environments are contrasted with the intimacy of the surface transducers, which create sounds that emanate from within the body.

DRONE SWEET DRONE
Anne Niemetz, School of Design

In current literature and the popular press, drones are most commonly associated with unmanned attacks on civilians and the surveillance of populations. Quite rightly, there is significant concern about the use of drone technologies for these often ethically dubious ends (e.g. Greenwald, 2013). Most recently, drone swarms, in particular, have been the focus of this concern. At the same time, a normalisation of drone technology is taking place. In the West this year many technology lovers, hackers and makers received drones as Christmas presents; and, as Matthew J. Cousineau (2011) observes, users can even play games on the US Air Force website that mimic missions to locate and destroy enemy targets. Cousineau goes on to argue for the advantages of studying surveillance as entertainment, rather than just focusing on its effects on civil liberties. He suggests that this approach can bring to light how surveillance agents use the language of popular culture to manufacture consent for their political agendas, as well as bring the domestic effects of foreign wars to the fore. In addition, he argues that by focusing on surveillance as entertainment, new questions can be asked, such as how masculinity is being reconfigured by technologies such as drones.

SPACESHET
Tom White, School of Design

We introduce a new spreadsheet based interface called SpaceSheets for creating novel images and other media. Unlike traditional digital tools, ours is parameterized entirely by a neural network with no preprogrammed rules or knowledge representations. The capability of SpaceSheets to support visual exploration and communication is demonstrated within the context of several domains including facial images, fonts, and english words. SpaceSheets is demonstrated to support the experimentation and exploration of latent spaces enabling more effective design experimentation.
The art installation, Drone Sweet Drone, is in dialogue with these debates and asks us to consider the ordinary and extraordinary effects of drones in our everyday lives. By referencing Home Sweet Home (an expression that was popular with troops on both sides of the American civil war), and seemingly glorifying drones, the installation aims to open up discussion about the uses of drone technology beyond its usual associations with warfare. As embroidered blueprints using Arduino powered lights, the aesthetic of the drones combines techniques associated with the past and the future; art and science; the amateur and the professional; and the feminine and the masculine. The blueprint text prompts us to further consider the potential of drones, as well as the gendering of new technologies and the masculine associations of war and surveillance. Drone Sweet Drone is purposely conspicuous rather than stealthy. Turning surveillance on its head, it wants us to study the fly on the wall that is increasingly becoming a greater part of our lives.

ANT PROJECT
Nico Vernio, Digital Architecture Research Alliance
The goal of the ANT project is to investigate possibilities for the creation of autonomous scout robots able to adapt to terrains, explore and map the environment (like a 3D scanner), and offer a real time point of view to the user through usage of VR headsets. The scout would roam around the targeted area on its own (AI and machine learning) and allow users to "step in" at any time to observe and move around manually whenever desired or required.

Prototyping up to v4, ANT project helped identifying problems and refining solutions related to basic functionalities: out of physical and mechanical limitations, primarily, how to solve efficiently the remote controlling, the processing of data and establishment of communication protocols between the server/controller and the client/robot. At this stage, the solution allows the device to move wirelessly within the range of the host network, in any direction, at variable speed and many other settings, such as reach of legs, incidence of the feet (last leg segment), height, length and "homing" of steps.

Allocating time and funding, the next steps are to extend work on AI and to implement distance sensing at the tip of each leg to allow the robot to gather and forward spatial data in view to create a point cloud map and a volumetric 3D representation of the explored environment. This would allow the device to adapt and travel across other than planar terrains, on top of extending/updating the overall geographical database on record. Mounting a real time stereoscopic camera on a gyroscope system would then allow VR headset users to visually inspect the robot environment, in any direction and in real time as if physically located in the robot’s position.

CLOUD COMPUTING
Jayn Verkerk, School of Design
This installation is an expression of people’s perceptions of cloud computing: information flows and ecosystems, connections and projections, sharing and data surveillance, loss of control and privacy, occult knowledge and hidden infrastructures. These are some of the responses of people when asked about their experience of the cloud.

Cloud computing and mobile devices provide convenient, seamless back up of personal files through centralised data storage, freeing users of the need for personal hard drives. Unlike most everyday technologies however, the infrastructure of cloud computing is unseen—reduced to an icon on a browser. The metaphor of the cloud provides a vision of data clouds floating safe above us. While in reality packets of data travel along subterranean network cables to data warehouses owned by corporations in unknown locations. Personal data is stored, and analysed to create big data that predicts user behaviour. While there are concerns about privacy and surveillance capitalism, as cloud computing is free and convenient, opting out seems unworkable. How do users reconcile and visualise their use of this invisible technology?

Through personal devices, personalised search terms, and tailored advertising the online experience is increasingly individualised and private. Removed from those around us, individual user’s experience of cloud computing varies. This project casts a critical eye on the intimate space of people’s imaginings of their cloud, and examines the role of the cloud metaphor.

Twenty-four people drew their cloud, including themselves in relation to their computing cloud. Three drawings that represent dominant themes were selected to develop in physical form: the factory, surveillance/spirituality, the noosphere. The resulting installation materialises these user narratives as physical cloud cabinets. Offering a tangible architecture in response to the cloud, this work reflects on the implications of the poetic metaphor of a cloud, and questions our perception and use of hidden technologies.
Workshops run from the 12th April - 14th April 2019 and are free to attend with registration.
WS. 1: CHIP OF THE NEW BLOCK(CHAIN): EXPLORING BLOCKCHAIN FOR DESIGN AND CONSTRUCTION.

CHAIRS & INQUIRIES
Dermott McMeel, Faculty of Creative Arts and Industry, University of Auckland.
Alex Sims, Faculty of Business and Economics, University of Auckland.
Chris Speed, Design Informatics, Edinburgh University.

WS. 2: BRINGING NEW VR INTERACTION EXPERIENCE WITH TMR PROJECTOR SYSTEM.

CHAIRS & INQUIRIES
LO Tian Tian, Harbin Institute of Technology (SZ)
XIAO Zuopeng, Harbin Institute of Technology (SZ)


CHAIRS & INQUIRIES
Anastasia Globa, University of Sydney
Rui Wang, Deakin University
Tuba Kocaturk, Deakin University

WS. 4: DEEP REINFORCEMENT LEARNING IN GRASSHOPPER: USING DEEP Q-NETWORKS TO TRAIN AN INTELLIGENT AGENT TO ACT IN A GRASSHOPPER ENVIRONMENT

CHAIRS & INQUIRIES
Nariddh Khean, Computational Design, University of New South Wales
Alessandra Fabbri, Computational Design, University of New South Wales
M. Hank Haeusler, Computational Design, University of New South Wales

WS. 5: MINIMAL SURFACE IN ARCHITECTURE.

CHAIRS & INQUIRIES
Walaiporn Nakapan, Lecturer, Faculty of Architecture, Rangsit University, Thailand.
Paulina Neisch, Department of Architecture and Civil Engineering, City University of Hong Kong.

WS. 6: GIRAFFE – OFFERING COMPUTATIONAL DESIGN TOOLS TO NON-COMPUTATIONAL DESIGNERS VIA A TWO-SIDED NETWORKED PLATFORM.

CHAIRS & INQUIRIES
Rob Asher, Giraffe Technology
Emily Leung, Cox Architects

WS. 7: CO-DESIGN IN HYVE-3D: REPRESENTATIONAL ECOSYSTEM AND AWARENESS OF THE PROCESS.

CHAIRS & INQUIRIES
Tomás Dorda, Hybridlab, University of Montreal.
Stéphane Safin, Télécom ParisTech.

WS. 8: IMPROVISATIONAL CONSTRUCTION IN DIGITAL TWIN ENVIRONMENT.

CHAIRS & INQUIRIES
Yasushi Ikeda, Keio University.
Nick van den Berg / Fologram.
Kensuke Hotta, Keio University.

WS. 9: CODE VERSIONING INSPIRED COLLABORATIVE PARAMETRIC DESIGN FOR INFORMED EXPLORATION AND EDUCATION.

CHAIRS & INQUIRIES
Verina Cristie, Meta Design Lab, Singapore University of Technology and Design
Rapid Space Design Prototyping Tool Based on Augmented Reality and Tangible User Interface
Ki Hoon Son, Seonghoon Ban & Kyung Hoon Hyun
Dept. of Interior Architecture Design, Hanyang University, Seoul, South Korea

A Block-chain Approach to Supply-chain Management in a BIM Enabled Environment
Adam Fitriawijaya., Hsin-Hsuan Tsai & Taysheng Jeng
Department of Architecture, Computing, and Digital Manufacture, National Cheng Kung University (NCKU), Taiwan, ROC

Algorithm Narrative Diagrams: Developing Narrative Diagrams for Algorithmic Modeling of Architectural Parametric Design
Chieh-Jen Lin
Tainan University of Technology, Tainan, Taiwan, ROC

Algorithm Narrative Diagrams: Developing Narrative Diagrams for Algorithmic Modeling of Architectural Parametric Design
Chieh-Jen Lin
Tainan University of Technology, Tainan, Taiwan, ROC

VENTS
Catty Dan Zhang, Mandi Ghavidel Sedehi, Austin Johnson & Pedro Pinera Rodriguez
UNC, Charlotte, USA

Developing Algorithmic Methodology To Visualize And Evaluate The Dynamics Of Urban Form In The Early Design Phase
Shao-Yu Cha & Tay-Sheng Jeng
Department of Architecture, National Cheng Kung University (NCKU), Taiwan, ROC
Prototyping of Chitosan-Based Shape-Changing Structures
Sachin Sean Gupta, Dhileep Kumar Jayashankar, Naresh D. Sanandiya, Javier G. Fernandez & Kenneth Tracy
Singapore University of Technology and Design, Singapore

A Study of Immersion Evaluation Factors of Users on Virtual Reality Space
Joonseok Lee & Kyeong Sook Nam
Dept. of Interior Architecture Design, Hanyang University, Seoul, South Korea

Crossing Digital & Analogue Mapping: Wangzai Village in Wenzhou Suburbs
Vincent Peu Duvalion, Ralph Spencer Steenblik, Miao Zhang, Zirui Wang, Tieru Huang, Zitao Zhang & Ruzhen Zhao
School of Public Architecture, Wenzhou Kean University, Wenzhou, Zhejiang, PR China

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Brandon Wang, Aurecon (Design Content)
Marc Aurel Schnabel (Maintenance)

GRAPHIC DESIGN & COVER IMAGE
Jessie Rogers 'Inhabiting Omni-architecture'