

# ARCHITECTURE BULLETIN

## Futures



# ARCHITECTURE BULLETIN

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## PROVOKE AUTHOR

Thank you to Jennifer McMaster who has been  
the Provoke author for the last three issues of  
*Architecture Bulletin* Vol 76 – see this issue's  
article on page 47.

The next Provoke writer for Vol 77 will be  
Chris Johnson. His background includes being  
editor of *Architecture Bulletin* (1975–76), NSW  
Chapter president (1982–84), NSW Government  
Architect (1995–2005), executive director of  
NSW Department of Planning & Environment  
(2005–09) and CEO Urban Taskforce (2011–19).

## FRONT COVER

One of several artificial humans being  
developed by Samsung's STAR Labs –  
Frank, a Neon architect in a welcome state  
Photo: © NEON. FOR DEMONSTRATION  
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## BUSHFIRE ISSUE – CALL OUT FOR CONTRIBUTORS

The Australia Institute reports that 57% of surveyed Australians have been affected by the bushfires this season. In NSW alone, they have burnt through around 5 million hectares, destroyed 2000 homes and claimed at least 25 lives. No sooner had architects across the state signed up to help, architects familiar with reconstruction efforts were telling us to wait. By the time the proposed Bushfire issue goes out in the second half of 2020 however, it will likely be time for us to act again, and we should do so fully informed.

We are seeking contributions for an issue dedicated to understanding how to move forward from these fires, given all we now know. We are seeking contributions primarily in the form of articles. However, if you can be a guest editor of this issue, please write to us with a proposal of how you would do this, with the names of eight or more authors whose contributions you would be able to solicit and bring together.

Please email an outline of your proposal (with Bushfire issue proposal as the email subject line) to [bulletin@architecture.com.au](mailto:bulletin@architecture.com.au) by 22 March 2020.

## READER'S RESPONSE

I am writing in response to Ben Giles' article on advocating for smaller homes. I applaud design thinking of 'small is beautiful', when an architect is innovative enough to make small spaces work and give an impression of more space than it actually physically presents through inside-outside opportunities. For example, Sam Crawford presented a very informative Architecture on Show talk at Parramatta some years ago on precisely this topic.

How do architects deal with clients who wish to live and age in place and requiring design to meet Liveable Housing Australia (LHA) *Liveable Housing Design Guidelines* and yet keeping a small footprint? Similarly NDIS Specialist Disability Accommodation (SDA) Design Standards have been published. Furthermore, changes to AS1428.1 – 2009 Access for people with disabilities, soon to be updated, continue to expand circulation requirements for walkways, ramps and sanitary compartments.

How would these challenges impact on housing design into the future? Food for thought ... or another article, perhaps?

Ingrid Pearson FRAIA  
January 2020

## WRITE TO US

Send your feedback to [bulletin@architecture.com.au](mailto:bulletin@architecture.com.au). We also invite members to contribute articles and reviews to our Chapter section. We reserve the right to edit responses and contributions.

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Meet Frank, a Neon architect – one of several artificial humans being developed by Samsung’s STAR Labs. Neon is described as a computer generated ‘virtual being that looks and behaves like a real human, with the ability to show emotions and intelligence’ – to ultimately provide companionship as a polyglot friend. As we foray into this new world where architectural job roles and industries are in flux, should we not be concerned that age old stereotypes of our profession continue even in the way an architect is characterised by an AI visualisation? We need to question how we remain relevant and relatable to the public if we are perceived as potentially replaceable as an industry of indistinguishable Franks.

Photo: © NEON. FOR DEMONSTRATION PURPOSE ONLY. NOT FINAL PRODUCT.



Technology is continuing to drive change in the architecture and construction industries, but it’s not the only variable within an industry in flux. New building priorities and methodologies are emerging from the construction industry, while developing design technologies present new opportunities and challenges for architects. In this shifting context, this issue investigates how the role of architects, the business of architecture, and the skills and constitution of the architecture workforce is responding. Do you heed the call to ‘innovate or perish’? Are there opportunities in a transition from ‘expert’ to ‘experimenter’? Here are reflections on a changing industry.

– NSW Chapter Editorial Committee

# Futures

# Creativity and the rise of artificial intelligence

Gregor Strachotta

‘If you don’t know where you are going ... you might not get there.’ – Yogi Berra

Harriet awoke and picked up the phone. ‘Harriet, where are you?’, Sean said. ‘I called a few times, don’t tell me you slept in? I’ll see you at the presentation to the board. If you don’t make it, make sure you upload the plug-in code.’

She was running late for the presentation of the new plug-in, the script they were working on for months. It took her some time to convince the system architect to let her secretly test it on the government’s AI database. She was convinced that this was going to be a breakthrough in enabling the AI machine learning in creative ‘thinking’ and negate the creative issues that existed with the existing platform, which transformed the industry in 2025. In the last test run the new script had created 89 buildable facade options, which were released on the Amazon Construction page.

Sean was a talented design manager at a large architectural firm, back in the days when they still built mostly in concrete. While the 2020 recession created a slowdown, the industry was unprepared and taken by surprise when a large corporation released the initial artificial intelligence platform, producing concepts and design solutions for the construction industry.

The following years saw AI permeating the industry, radically disrupting and transforming it. Technology enabled the full integration of industry codes, standards and wifi-

recognised human movement patterns into an AI based system. While the few large data based corporations profited on those drivers of change, the demand for traditional architects dramatically waned. AI technology had changed the future of the construction industry.

The dynamic AI platform was able to offer multiple options for each stage of a project within minutes, predicting human movement patterns and even suggesting sustainable construction methods and vertically integrating the industry. However, the AI platform struggled with creative based decisioning. After all, creativity proved hard to be rationalised. Sean was one of those whose career shifted through this new future and he became a creative system assistant to the AI.

Sean assisted the AI by providing creative design solutions where it faltered, such as resolving aesthetic misalignments of facades, balcony placements and human centered design. After manually correcting the issues, Sean then would release it back to the AI platform for industry code and standards checks and then the project was sent to the AR department and robotics centre for prototyping.

Most clients and project managers relished the speed and efficiency of the AI platform. Without an architect present, they fed in their requirements directly and much like Squarespace back in 2018, they could now swipe their way through solution templates to envision entire projects from concept, costing, compliance, standards and value management to suggested construction and buildability options. Like in a gameplay, complete augmented cities could be recreated with a swipe of a finger.





A drawing by Gregor Strachotta inspired by William Gibson's dystopian novel *The Peripheral*, in which nano robots build/deconstruct complete buildings

Sean has witnessed the morphing of the role of the architect. He had went from being creative to assisting creative processes, to today when he is merely viewing the many options being dynamically created in front of his eyes. The system only prompts him occasionally these days to accept, reject or manually alter a design on the real-time platform.

Later today, his daughter Harriet will present the new 'creative' plug-in, which will further transfer the role of the architect to that of the AI. Sean will be looking for a new role, perhaps on the smaller, but striving P2P market, such as AirtaskerPro and the like, offering work on a few bespoke luxury houses for clients with an eccentric appetite.

\* \* \*

The above scenario is placed in the sweet spot of being neither here nor quite in the future yet.

The transformation of Sean from being a creative to assisting a system that creates is not trying to be a utopian or dystopian revelation of our industry. It rather offers a discourse and invites a sense of ownership of the future to our industry. Many sectors have already seen fast changing transformation with the emergence of the fourth industrial revolution, while the construction and architectural industry, like an oil tanker, is moving at a slower pace. So slow that one might get the impression that apps like Revit, BIM and Lumion represent the maximum range of innovation in our industry.

With the fourth industrialisation further emerging, could another industry step into the construction sector and transform it from the outside, beyond our current mission statements and what we envision? No single person can predict the future, but I do believe that the architect, a traditionally visionary leader, is well placed to be part of informing it. To use William Gibson words, 'The future is already here. It's just not evenly distributed yet.'

Gregor Strachotta is an architect, designer and strategist with a degree in strategic foresight from the Swinburne Business School. He is the founder of Deft Architects and has an aptitude for critical design and storytelling with the goal of envisioning future projects.

# Futures: going by the book

Sue Wittenoom



David Manley, *Post Traumatic Urbanist #14*, 2019, archival photographic print Courtesy the artist

There is a corner of my library for desperate dystopias. Cormac McCarthy's *The Road*, Lionel Shriver's *The Mandibles: A Family, 2029–2047* and JG Ballard's *The Drowned World* make a trio of nuclear, economic and geological catastrophe. Non-fiction reading right now is just as distressing. Bill McKibben hasn't quite thrown in the towel; in *Falter* he hopes that solar power and non-violent citizen revolt might still make enough of a difference. Naomi Klein's *On Fire* is amplifying Greta Thunberg's message that we should act as if our actual house was on fire, because it is. If you ignored the multiple smoke alarms long enough to read one book right now, *On Fire* would be my pick. Klein bundles up her articles and speeches from the last decade and sets out the case for the Green New Deal. A compelling future does still seem possible.

I have spent thirty years helping organisations get the most out of a new building by using both the design process and the built environment as a lever for doing things differently – in the future. I have a low-tech toolkit with butchers paper and Post-its that is all about getting people in a room to talk about change.

I seed these conversations with future scenarios. If you google 'CRC scenarios 2040' you can see an extraordinarily vivid series of propositions for a low carbon future.<sup>1</sup> Or head to YouTube and search for 'Microsoft: productivity future vision'.<sup>2</sup> That's Macquarie Bank's Shelley Street campus in the workplace vision – a hypothetical that lets us see the future as part of a continuous present.

But in 2020, the environment is not just one uncertain element in scenarios that explore artificial intelligence, machine learning, globalisation and demographics. Bill McKibben put it best when he said, 'the physical world is going from background to foreground'. The future is happening right now. And the global scientific community says we must move further and faster if we're going to avoid 'untold suffering'.<sup>3</sup> Business as usual for our planet is suicide.

We've signed up to declare the climate emergency. Do we still have time to bring people together to talk about what we do next? For once the scope of work calls for transformation at all levels of society, not change management. The challenge has sent me back to revisit another book: *The Answer to How is Yes: Acting on What Matters* (Berret-Koehler 2002) by Peter Block, an American author and consultant in organisation development and community engagement.<sup>4</sup> Beautifully illustrated by photographs of impossible rock balancing sculptures by Bill Dan, this has never been an easy read for me. Block picks up the challenge of hastening slowly – an idea as unlikely as Bill Dan's rock sculpture. The paradox at the heart of the book is that letting go of the practical imperative is the best way to find a larger sense of where we want to go and what values we want to embody in getting there.

Block's thesis is that transformation comes more from pursuing profound questions than seeking practical answers. Asking how to do something is a defence against action. We yield too easily to what is 'doable and practical and popular' instead of 'pursuing what most matters to us and living with the adventure and anxiety that this requires'.

The risk manager focuses on practical questions like these:

1. How do you do it?
2. How long will it take?
3. How much does it cost?
4. How do you get those people to change?
5. How do we measure it?
6. How have other people done it successfully?

Taken in isolation, and asked in the right context, all the 'how' questions are valid. But when they become the primary questions, they keep us operating inside boundaries that don't serve as well. 'How?' is the wrong question to start with; 'when asked too soon and taken too literally it may actually postpone the future and keep us encased in our present way of thinking'. Block suggests six alternative questions – 'yes' questions – that draw us into what matters:

1. **What refusal have I been postponing?** What have I said yes to that I didn't really mean?
2. **What commitment am I willing to make?** Because authentic transformation needs more time than we ever imagined.
3. **What is the price I am willing to pay?** Because money is the most common rationalisation for inaction.
4. **What is my contribution to the problem I am concerned with?** This question gets us out of the audience and onto the stage.
5. **What is the crossroad at which I find myself at this point in my life/work?** Does this change have value and meaning for me?
6. **What do we want to create together?** How will the world be different tomorrow as a result of what we do today?

Each 'yes' question becomes the counter to the 'how' question. Block then explores aspects of the human condition that support our pursuit of what matters: idealism, relationships, intimacy and depth. And the shifts in thinking are translated into action when we embrace terms such as radical, activist or citizen.

If this was not enough to convince you to read this important book for yourself, Block sees architects as critical to creating the social structures we need. He contrasts the instrumental archetypes of the engineer and the economist with the idealism of the artist and the architect. And he looks to Christopher Alexander's *A Timeless Way of Building* to argue for the architect as the key archetype to shape collective action.

Each time I come back to this book the 'yes' questions have always seemed to be too much for my clients – too intimate, too idealistic, too provocative. But right now, they seem perfect for a citizen facing an increasingly apocalyptic future and a shrinking window to act.

Sue Wittenoom is the founder of The Soft Build, a change strategy consultancy for the renewal and reinvention of buildings, spaces and people.

NOTES

1. Download *Scenarios 2040 – Results from the second year of Visions and Pathways 2040: Scenarios of Low Carbon Living* (2016) at: [lowcarbonlivingcrc.com.au/sites/all/files/publications\\_file\\_attachments/rp3008\\_scenarios2040.pdf](https://lowcarbonlivingcrc.com.au/sites/all/files/publications_file_attachments/rp3008_scenarios2040.pdf)
2. View 'Microsoft: productivity future vision' at: [youtube.com/watch?v=w-tFdreZB94](https://youtube.com/watch?v=w-tFdreZB94)
3. 'World scientists' warning of a climate emergency', *Bioscience*, vol 70 no 1, January 2020: [academic.oup.com/bioscience/advance-article/doi/10.1093/biosci/biz088/5610806](https://academic.oup.com/bioscience/advance-article/doi/10.1093/biosci/biz088/5610806)
4. More on Peter Block's writing: [peterblock.com](https://peterblock.com)

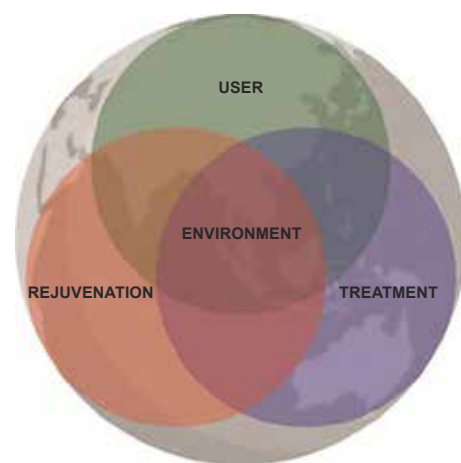
# Human-centred design for rejuvenating the environment

Adam Hannouch

Digital tools are essential to designers and planners for their oversight of the conception and realisation of projects but where does the client or end user sit within this workflow? In recent years we have begun to adopt digital capabilities that increase the responsibility of the client to make design decisions and to give critical feedback throughout the design process. Urban development, since the turn of the 20th century, led to a dominance of building and development by contractors and consultants. In contrast to past do-it-yourself models of building, we now knowingly offer the responsibility of our built environment and dwelling places to professionals who do not intend to live in them. This detachment has undoubtedly had negative implications on the end users' liveability of the built environment. In the complex design and construction process that has been developed and refined over the last century, professional consultants on different ends find complications in communicating with one another, so it is not without reason that the user/client is spared or left out of the design process. This is about considerations that take design workflows from design tools to communicators between the end user and the project for human-centred design, embedding the lay person or nonspecialist to influence the potential of specialist tasks.

'Here is where the real novelty lies: we let each distinct subsystem develop according to rules for adaptation, and our role as designers is merely that of facilitator. Namely, we are not going to dictate its design using any preconceived ideas or images.' – Nikos Salingaros

An entire era has been dominated by a visual communication of the environment. Thermal comfort, wind control, air quality, noise pollution and road traffic (to list just a few) are all communicated visually to the end user, yet they are either entirely absent from or not primarily dependant on visual experience in their actuality. While most implementations of digital tools such as building information modelling (BIM) and augmented reality (AR) allow a virtual navigation of space, they aren't yet entirely immersive. These tools have prioritised



Only when design workflows plug the end user in, can a holistic approach to the environment be appreciated.

interoperability between designers, engineers and other consultants, but different ways of communication are beginning to find their place in human-centred softwares and technologies.

New models of representation rely on user interaction for crowd sourcing habitual experiences. In one example, the *Hush City* app (developed by Antonella Radicchi) uses crowd-sourcing for lay people around the world to upload and share their self-identified 'quiet spots' by recording the location, audio, sound levels and picture of the spot, and to evaluate the perceived quality of the environment. This suggests a shift is taking place from specialist-only environmental study tools. Representation, being crucial in the perceptive awareness of the lay person of the key features of the environment (whether it is climatic, sonic or solar), can benefit from computational design models. In the near future, implementing AR into a BIM model for the renovating or refitting of an existing space will allow the user to analyse performative results of the environment. Users can change parameters while the system updates the simulations or visualisations of the results. How far will virtual simulations get when the user is immersed into senses of sound, heat, touch and many other phenomena? Representations of this kind offer a symbiosis of visualising and experi-



# Sustainability to sustain humanity

Maryam Houda

encing the environment we inhabit, contributing to an appreciation of positive experiences by encouraging an engagement with such tools.

The digital tools we work with become totally unified when the end user is in confluence with the design process. Being a process where BIM helps to ensure that every stakeholder has the information he or she needs to make the best decisions, it is a qualifying candidate for human-centric collaboration. Human-centred design creates an empathy with the people we are designing for; the user is able to understand and conceptualise environmental phenomena, apply interactive design tools and technologies, evaluate the usability and user experience of interactive systems, and communicate these results in the collaborative model where there is transparency with the public or with private users of dwellings.

The visual representation of the design process is currently out of touch with the environment and living conditions of humans. For this reason, designers begin to develop a holistic approach that can communicate the environment to the end user and in turn place the end user at the centre of the design workflow. Going back to the human as a micro-cosm of the environment we inhabit, the concept can be transcended across physics, from atoms to celestial bodies, where a nucleus always exists in something larger than it. When planning, we must delicately balance the built environment with the overlap of daily activities. The social imperatives of living, working conditions or an overlap of recreational conditions can be reconsidered by revisiting the traditional circumstances of the people that we are planning and designing for.

Adam Hannouch is a PhD candidate in architecture and a casual academic at the University of Sydney. His work is interested in the crossover between human-centric design, the built environment and computational methods.

‘Architecture is essentially human; it is the human spirit manifesting itself.’ – Frank Lloyd Wright

For thousands of years, our predecessors built locally and sustainably, without the need of a formal architectural representation method. With a deep knowledge of the local environment and the availability of local materials for building, unique vernaculars and distinctive building techniques formed in harmony with nature. It was a time where architecture was built with the hands rather than manufacturing technologies that prospered as a result of the industrial revolution at the loss of cultural diversity. Currently, there is an emerging appeal for digital tools and fabrication methods, yet the focus has been on the tool rather on what the tool can do. Tools have existed since the earliest civilisations, but it was a simple and direct simultaneous process that celebrated the dialogue between the hand, the tool as the extension of the human body, their interaction with locally sourced material and the materials response to the local environment. The essence of building was at the core of what it means to be human, essentially forming culturally enriched spaces that assist in traditional daily activities. With the rise of digital gadgets and trends in parametrically derived forms, there has been a lack of an engagement with the ‘primitive’ vernacular, fundamentally the core of identity to architecture. Thus, there is a necessity to requestion what these digitally designed and fabricated forms provide for the social context apart from aesthetics. If they fail to assist humanity in terms of cultural values and the natural cycle of life, then are they even necessary at all?

In the context of modernisation and the global effect of building with mass-produced materials and non-native construction techniques, there is a need to reshift our ways of designing and making to a more local and humane scale to preserve and sustain culture and identity through architecture. In doing so, the process can open opportunities to reconnect users of spaces back into the design and making of habitable structures. Architecture has always been built by

people for people, yet over the years, with the pressures of globalisation and modern developments pushing towards mass manufacturing, buildings have been generically constructed without consideration of how these spaces facilitate traditional ways of living. Thus there has been increasing interest in returning to the vernacular as a way of not only producing culturally rich social environments, but as a way of building sustainably – not only in addressing environmental, social and economic issues, but sustainable building methods that are in tandem with nature as opposed to destroying it.

Many traditional fabrics and even whole communities have been destroyed or abandoned in place of mass-standardisation and globalisation. Dubai, for example, is one of the fastest growing economies in the world. With over 75% of inhabitants not being national citizens, but rather ‘imported’ human resources for driving that economy, a megacity is being built while sacrificing heritage communal villages and districts for the development of ‘modern’ buildings. Consequently, the traditional communal way of life and building, as well as centuries-old passive building methods which are in sync with the environment, are at risk of extinction, giving way to concrete high-rises that have no relation or appropriateness to the desert conditions or the cultural norms and social needs. In doing so, we witness an identity gap. For all we know that very same concrete building could be a replica of another halfway across the world. Where there is no sense of place, there is no placemaking and where there is no placemaking, identity is lost. An awareness is growing and can be reflected in the contemporary architecture in Dubai, where stereotypical patterns or forms of the past are replicated,

usually in facade design. However, vernacular must not be limited to the skin. Instead, it should be immersed in social experiences that not only reflect an architectural type but reflect the connection between people and place. It can be a way of creating ‘living’ spaces where material and form are culturally embedded, as opposed to creating dead, meaningless spaces that are unable to sustain and fulfil humanity’s physical, social and cultural needs as a response to our natural environments. By detaching from mass-standardised availability of materials and construction techniques, and by immersing our focus to learning and collaborating with local craftsmen and engaging at a communal building scale, digital technologies and parametric design may be able to produce new ways of doing things by merging the learnt way of life with the digital. This would produce new vernacular typologies that not only address regionalism, but also empower local architects, engineers and designers (as well as those informally trained), to tailor their own workflows and processes in a contemporary context.

Vernacular is ageless and as humanity evolves so do our ways of making; yet we must stay true to our roots of what it means to be human. It is our responsibility as architects to not only protect the natural and built environment, but to also fulfil human values and purpose through the spaces we create. Sustainability, the foundation of vernacular architecture, can be a way to sustain and continuously rejuvenate our human experience. As Norman Foster said, ‘Architecture is an expression of values – the way we build is a reflection of the way we live’.

Maryam Houda is a PhD candidate and a casual academic at the University of Sydney in the School of Architecture, Design and Planning. Her interests lie in the convergence of vernacular architecture and digital fabrication methods.



Men unloading imported cement at ‘Cement Wharf’ (now Port Rashid) in 1967, in the lead up to expansion plans of Dubai after oil is discovered in 1966 Photo: Chris Ware

# Harnessing big data to make cities

Michelle Cramer

‘Just think of all the things that have come and gone in our own lifetimes, all the would-be futures we watched age into obsolescence – CD, DVD, answering machine, Walkman, mixtape, MTV, video store, mall. There were still some rotary phones around in our childhood – now it’s nothing but virtual buttons.’

– Rich Cohen, *The Bestest Generation*

Just think what this means for the future of places. The age-old tradition of making buildings, places and cities by hand, by craft, by precedent, by discipline, by bespoke design, by mass production, by CAD, by BIM. It’s time to bring big data into the mix and get a handle on the power of data to shape the future of our cities.

## *BIG DATA AND HOW IT CAN RELATE TO PLACE*

Big data surrounds us, generated every minute of every day and changing the way we live our lives. ‘Big’ refers to computational data that is too large and complex for traditional data processing to deal with. A step into the world of big data means a new language: data capture, data storage, data cleaning, analysis, search, share and transfer. It is also about visualisation to interpret, understand and apply information. As a starting point, we are beginning to use data to understand when, how and why crowds form, and to predict their movements and actions. In 2017, Transport for NSW released some of its Opal data enabling research into the aggregated movement analytics of commuters based on real-time, real-people data for the region. Granular and dense, the information maps origin, destination, time spent in location, customer preference and movement behaviours, to name only a few insights. Every tap allows us not only to better understand the city, but also how to improve it.

## *WE’VE GOT IT, BUT HOW TO USE IT?*

So now we have big data, what can we do with it? The new (city) designer will be part creative, part scientist. New courses offered by institutions, such as the urban science offering at the University of NSW, tells us academia is ahead of practice in understanding the power of big data to the creation of place. In 2016, I was part of the Urban Development Institute of Australia’s NSW City Life Labs program. The value of connectivity research set out to use big data to understand where best to locate infrastructure to facilitate growth in metropolitan Sydney. Taking part in the research were academics, data analysts, advocacy groups and industry practitioners. Very much a data/ city-making mash-up and journey of discovery, the key lesson learnt was the power of data set correlation with respect to the key urban questions of

our time. In other words, we asked the data analysts in which centres in Sydney people appeared to stay the longest and why? Using Opal data, could we see which public transport hubs had the longest diurnal stay and, using ABS data, could we correlate this tendency to linger to the types of jobs, entertainment and living environments happening in those locations? With cautious, baby steps the resounding answer is yes. It also highlighted anecdotal evidence between what people say they do versus what really do. The research quantified that the people of the Northern Beaches, who say they live work and play in the Northern Beaches, do just that. But the people of the Sutherland Shire, who also say they live, work and play in the Sutherland Shire, rely on Sydney’s central business district for employment, providing a gap analysis between truth and desire.

## *IS THE FUTURE WITH THE MACHINES?*

The potential for big data to inform our city-making decisions is immense, and the potential for machine learning to anticipate the needs of a demographic, society and contextual place is even greater. A 2017 ABC television documentary on artificial intelligence, *The AI Race*, investigated the likely obsolescence of jobs while interviewing a diverse group of professionals about their chosen field and their perceived potential future. The higher the AI score, the more likely the profession will be impacted and altered by machine learning and robots. The more likely the profession is dependent upon human interaction and nuanced decision making, the less likely the machines will step in. For city planning and design this is both an opportunity and a professional shift. While the building code and policy frameworks may be inherently handled by algorithms, how humans make decisions about place creation for other humans will be elevated.

## *THE WAY FORWARD*

The real value of the urban design and place-creating professions of the future will be to apply the knowledge garnered through big data, and its cousin technology, to the real-world experience of people. We need to introduce to contemporary city-making practice the overlay of big data to further support, enable and shore up our desire for smarter, more resilient and deeply genuine cities. But we can’t rely on machines alone, at least at this stage, to understand the visceral, emotional and distinctive responses humans have to places. And for that reason, the design professions are safe, for now.

Michelle Cramer is head of product at Lendlease Integrated Solutions.

This essay is an extract from *The Place Economy: Volume 2*. To find out more or to purchase a copy go to [www.theplaceeconomy.com](http://www.theplaceeconomy.com).

# Whose future? On the politics of building smart cities

Jathan Sadowski



Screens displaying live camera feeds and data analytics from across the Brazilian city of Rio de Janeiro at their city hall's operations centre Photo: Pulsar Imagens / Alamy Stock Photo



Living in a city means more than just being an inhabitant of a place. The city also lives through us. It changes who we are. It affects our experiences of the world, perceptions of ourselves, relationships with others, routines of everyday life and imaginations of what is possible. The ways in which cities are built and planned are choices about more than just real estate and management. They are also about creating subjects and society. As sociologist Robert Park remarks, ‘If the city is the world which [people] created, it is the world in which [they are] henceforth condemned to live’.<sup>1</sup> But the creators and condemned are not necessarily the same, nor do they stand on equal ground.

Those who can guide how cities are developed are poised to reap the benefits. Their interests and values are woven into the urban fabric. Their desires and legacies are materialised, extending through space and time, outpacing and outliving the otherwise limited human capacity for change. Indeed, cities have long had a magnetic allure for those who want to leave their mark on the world. ‘The promise of durability has attracted kaisers, kings, mayors and other megalomaniacs to the built environment,’ writes urban planner Rachel Weber. ‘The physical-technical ensemble of the city – buildings, sewers, roads, monuments, transport networks – conveys a sense of fixity and obduracy that appeals to the political desire to make strong, lasting statements’.<sup>2</sup>

Thus, it should be no surprise that a striking amount of effort has been channelled into selling a specific vision of the future city. This is a city where every feature – from its buildings and streets to its planners and police – has been made smart through an ensemble of digital, data-driven, network-connected and automated technologies. Sensors for recording information about everything. Networks for connecting everything together. Analytics for making sense of everything. Algorithms for controlling and coordinating everything. The ultimate goal is to reconstruct the city into a ‘system of systems’, as the global technology company IBM calls this model of smart urbanism.

A paradigmatic example of smartness in action is the NASA-style control centre in Rio de Janeiro built in partnership with IBM – other cities like London and Jakarta have also installed their own versions built by other companies – which is fully equipped with rows of computer terminals and a wall of screens displaying live camera feeds and data analytics from across the city. Another example of urban upgrades is the smart management systems that have been integrated into buildings in cities worldwide, including in Sydney and Parramatta. Such systems seek to use ubiquitous computing,

sensor arrays and automated control to optimise a building’s performance, reduce energy consumption and respond to its inhabitants’ behaviour.

The smart city is a dynamic movement. It is propelled forward by constant development and deployment of new technologies – or, more specifically, by the large companies and consultancies that sell these smart upgrades – which promise to solve the most pressing urban problems and deliver unfettered benefits for cities worldwide. According to the major proponents of smartness, if cities are going to survive and thrive moving forward, then the entire urban system – transportation, buildings, water, electricity and more – must eventually be redesigned and made smart. This means acquiring greater amounts of information and control, which empowers those who develop and govern the city to ‘do more with less’. This is the only way to sustain a vision of the city as a nonstop growth machine.

However, as I explain in my new book, *Too Smart*, these high-tech solutions, and the utopian rhetoric about progress that surrounds them, often serve as an effective red herring that distracts our attention away from broader questions about how our built environments are designed: For what purposes? In whose interests?

As professionals of the built environment, it’s imperative for us to understand how this movement of smart urbanism is shaping the material landscape and governance practices in cities. But beyond just keeping track of new technologies available to us, we must cast a critical eye on the visions being sold. We must keep in mind core issues related to how people live in cities and how societies are shaped by cities. Promises to redesign the built environment, to implement powerful methods of monitoring and managing these places, should not be taken lightly – especially when they originate from some highly influential and wealthy sectors with something at stake.

When it comes to thinking about smart cities, perhaps the most important question to ask is: Whose future is being built?

Jathan Sadowski is a postdoctoral research fellow in smart cities at the University of Sydney. His book *Too Smart: How Digital Capitalism is Extracting Data, Controlling Our Lives, and Taking Over the World* is published by MIT Press, 2020.

NOTES

- 1. Robert Park, *On Social Control and Collective Behavior* (Chicago University Press, 1967), p. 73
- 2. Rachel Weber, ‘Extracting value from the city: neoliberalism and urban redevelopment’, *Antipode* (2002), vol. 34, no. 3, p. 519

# A conversation with the building commissioner David Chandler

David Welsh

David Chandler’s first address to the architectural public was presented in Sydney last September with the title ‘A conversation with the building commissioner’, however it was the subheading that was, like the man himself, ambitious and direct. Simply put, it said: ‘A strategy to make New South Wales Australia’s state of construction by 2025, the biggest micro-economic reform in the construction industry to date.’

## THE DRAFT DESIGN AND BUILDING PRACTITIONERS BILL

The building commissioner explained what he saw as an ‘industry crisis’. He sees the industry as having ridden up and over a ‘peak of inflated expectations’ and was plummeting towards a ‘trough of disillusionment’. With the remit he has been given by the state government and the powers to act under the (still yet to be passed) Design and Building Practitioners (DBP) Bill 2019 introduced by the NSW minister for better regulation and innovation Kevin Anderson, the commissioner outlined his plan to bring the industry up to a ‘plateau of productivity’ by 2023.

When the DBP Bill is passed (hopefully sooner rather than later), the commissioner will have a range of powers to regulate both design and building work. So how will architects be affected by this, and looking more proactively: how can we play a role in this reform? While the DBP Bill will put the overall regulatory measures in place, the commissioner also outlined a few key levers that will be put in place that will directly affect architects. Five critical ones outlined were:

1. The establishment of a new industry led ratings system.  
Building designers and practitioners will be rated. The commissioner wants to see experience and knowledge valued and wants to see it not just rewarded, but become a vital component in establishing quality industry standards and reviving consumer confidence
2. A reorganisation of how Australian Standards are accessed, which will make them easily accessible to (and properly used by) designers and building practitioners
3. Building practitioners (builders and contractors) who have

been in business for less than five years will not be able to utilise D&C contracts. Instead they will have to use a new type of contract that will require ‘full design’ documentation

4. D&C as a procurement system will only be accessible to building practitioners with suitable experience and a good track record
5. The concept of declared design: design represented as a set of design documents that respond directly to BCA and DA requirements which will represent the ‘lawful beginning’ of a building.

These levers will be activated once the bill becomes a regulatory act, however there has already been movement towards reform. The fact that we now have a state building commissioner has sent a message to consumers that they have a real advocate for industry reform. While still very much in an establishment period, work has already begun on gathering evidence-based data to back up any levers that may eventually be put in place, including the planning and undertaking of case studies that will become the basis for evaluating where the construction industry is at.

## THE FUTURE FOR ARCHITECTS

There was also a sub-subheading in the commissioner’s first slide. It simply said: ‘The future for architects’.

The commissioner elaborated on how he saw architects fitting into the picture. He sees a future where architects are enmeshed with information technology. With labour costs now often passing \$100 an hour he sees an industry that has reached an effective tipping point between onsite construction/assembly and offsite prefabrication. He wants to see ‘a new cohort of designers and builders’ evolve that embrace innovation and MMC (modern methods of construction), where an emphasis on establishing effective design delivery systems (here he mentions BIM in particular) rather than the traditional ‘build and fix’ method will reduce waste and increase efficiency.

This vision is rather simplistic and one-size-fits-all, but



David Chandler

*‘Ultimately the issue being discussed is one of quality. The commissioner wants to change the industry from being self-facing to customer-facing, where the focus is on the end user and the product that is delivered for them.’*

for the purpose of reporting the proposed reforms now isn’t the time to argue the position. What this point of view does is enable the commissioner to start on the low hanging fruit at the bottom of the industry, where simple definitions enable first reforms to be put in place.

There is still a lot of detail to be worked out, but there is now a framework in place. One of the hardest parts of a process is getting started, and this is definitely a start, and that’s probably the most important point the commissioner wants to make.

Ultimately the issue being discussed is one of quality. The commissioner wants to change the industry from being self-facing to customer-facing, where the focus is on the end user and the product that is delivered for them. He describes

the current construction industry as being ‘20% risky, 20% less risky and 60% OK’. This isn’t a particularly positive description of where we are at, but it can be argued that it is a realistic one. As architects we have an important, effective, yet still evolving part to play in the process towards re-establishing consumer confidence, where design has a legislated value which can be built upon. The process isn’t yet entirely clear but it has started, and if the overall quality of buildings in this state improves, it will be a journey worth embarking upon.

David Welsh is a member of the Architecture Bulletin editorial committee. He is also a writer and co-founder of Welsh+ Major, an architecture, interiors and urban design practice he established with Chris Major.

## Current task thinking (subject to formal approval processes)

Tasks	Actions	Outcomes
1. Regulatory framework	Declared plans, certifications and as-built documentation	Reliable customer facing proof of construction performance
2. New Industry driven ratings and risk systems	Work with ratings agencies, insurers and financiers	Move away from on-size fits all participant recognition in 2021
3. Building Confidence education collaboration to focus on key multi-discipline skill needs	Raise the bar for accreditation of all construction related programs	Shared minimum learning content and open source resources for all institutions from 2021
4. Rationalisation of standard form procurement methods	Establish clear standards for engagement and outputs	Viable risk allocation and performance accountability
5. Identification of digital assurance applications	Facilitate new Public – Industry partnerships to deliver new tools	Shared industry wide platforms that build confidence
6. Customer facing modern construction industry	Evidence based approach to accessing and closing the gap	Attractive industry narrative to underpin public confidence



From David Chandler’s presentation: an overview of where the current thinking is in terms of tasks to be undertaken

# Alternative Housing Ideas Challenge

Stephen Varady

In March 2019, the City of Sydney launched the Alternative Housing Ideas Challenge. The City and councillors Jess Scully and Phillip Thalys, in particular, need to be congratulated for this important initiative and for their positive and enlightened desire to begin a broad conversation about housing issues in Australia.

Having run a number of successful architectural competitions in Australia, including the Green Square Library and Plaza competition (2012–13) and the Green Square Gunyama Park Aquatic Centre competition (2014–15), both for the City of Sydney, the City knew I had the skills and knowledge to advise and prepare this project for them.

This was to be a little different to those previous competitions, so I wrote a brief and prepared a structure to accommodate that difference. This wasn't necessarily about designing a single building, it was about *ideas*. It was not about one winner being selected to design one particular building but a number of proposals, exploring a broad range of ideas, being selected for a series of stage two workshops where those ideas could be fleshed out and refined, and presented to the City and its citizens in a public exhibition. The rationale was that this approach might trigger further responses from the City and the broader populations of Sydney and Australia, perhaps leading to the actual implementation of some or all of these ideas.

The City wanted to elicit ideas from around the world, so eligibility was very broad – open to any person, team of people or other legal entity from anywhere around the world. Housing issues are influenced by many factors – including procurement, zoning, stewardship, design and, most important, funding. We invited people not only from Sydney or Australia but from all around the world; not just planners or architects but anyone at all to send us their proposals about any housing-related ideas that might improve our current situation. The challenge brief stated:

Through this Ideas Challenge, we want to explore the barriers that are stopping existing ideas being implemented in Sydney and how we might overcome them.

We are also interested in uncovering any new alternative housing ideas appropriate to Australian conditions that have the potential to be successful in Sydney and the wider community.

This Ideas Challenge is about strategic thinking – how can you think in new, creative and positive ways to uncover boundary-changing attitudes towards the future of housing?

You may have alternative ideas for financing, design, zoning, urban land supply, management or ownership – if so, we want to hear about these.

We had over 1000 registrations to the Ideas Challenge and received 231 proposals by the May 2019 deadline.

To select our finalists we gathered together an intelligent, highly qualified jury of respected professionals from the fields of housing, architecture, planning, finance, academia and property. That jury was:

Darlene van der Breggen (jury chair), strategic design advisor, Government Architect NSW;

Helen O'Laughlin, social commissioner, Greater Sydney Commission;

Kerstin Thompson, principal, Kerstin Thompson Architects; Professor Bill Randolph, director, City Futures Research Centre, University of NSW;

Karen Walsh, executive officer, Shelter NSW; and Troy Loveday, senior policy advisor, Property Council of Australia.

Over the course of three long days they studied the 231 proposals in detail and with their combined knowledge, professionalism, expertise and patience, they selected seven proposals:

1. THE RIGHTSIZE SERVICE **Dr Alysia Bennett**, lecturer, Monash University, with **Dr Damian Madigan**, senior lecturer in architecture, University of South Australia, and **Dr Dana Cuff**, professor of architecture and urban design, University of California, Los Angeles

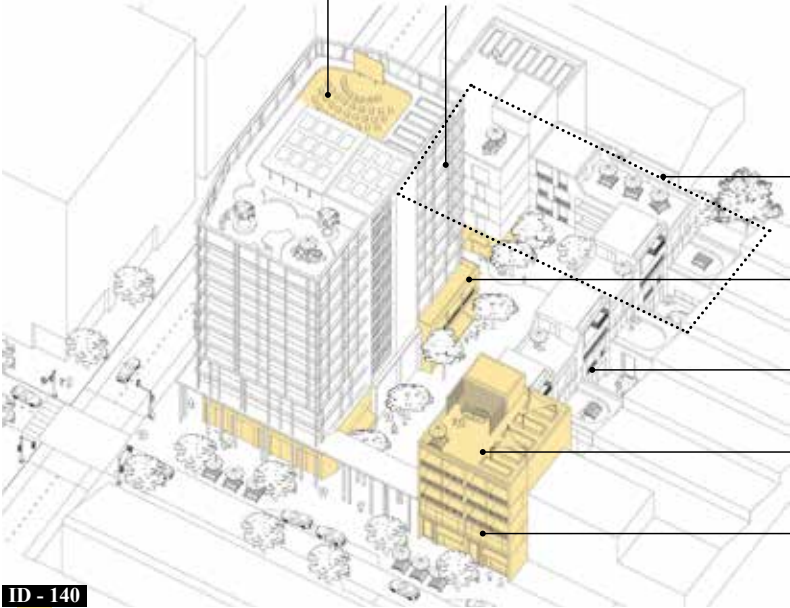


A cooperative prototype

Prototype of an affordable rental cooperative on City-owned land in central Sydney, that gives back to the community as well as delivering affordable rental housing. Responds to planning controls that apply to sites in Green Square, Sydney.

Communal roof terrace able to be commercially leased for events as part of a cross subsidy strategy

Flexible, efficient floorplate residential slab building with load bearing facade to enable a range of dwelling configurations over time



Basement mobility hub of 1000sqm with electric share vehicles and hire scooters and ebikes for use by members and the broader neighbourhood

Two level childcare facility with mews outdoor space secure during hours of operation and open to the public outside of hours

Work/live lofts and larger family dwellings with direct front doors to a semi public garden mews

Boutique hotel with integrated first floor co-working facilities and social enterprise restaurant

Ground floor small retail tenancies owned and managed by the cooperative to support a dynamic mix of uses typically excluded from speculative development

ID - 140

Non-residential uses to cross subsidise housing rental

A detail of one of the seven selected proposals from the Alternative Housing Ideas Challenge. Alexis Kalagas, with Andy Fergus and Katherine Sundermann, proposed a 'third way' between unaffordable market rental and social housing models. 'Adapting this approach [by Zurich] on City-owned land would increase the affordable housing supply, make long-term renting a viable option, and give back to the city in the form of shared amenity and an ecology of supporting creative uses.'

- 2. SYDNEY SMART HOME **Joe Colistra and Nilou Vakil**, Principal Architects, in situ Design, Kansas, USA
- 3. METROPOLITAN LAND TRUST POLICY **Dr Louise Crabtree**, senior research fellow, Institute for Culture and Society, Western Sydney University, and **Jason Twill**, director, Urban Apostles
- 4. THE THIRD WAY **Alexis Kalagas**, urban strategy designer, ETH Zurich, with **Andy Fergus**, urban designer, City of Melbourne, and **Katherine Sundermann**, associate director, MGS Architects
- 5. PIXEL PILOT **Anita Panov and Andrew Scott**, directors, Panovscott Architects, and **Alexander Symes**, founder, ASA
- 6. EQUITY HOUSING MODEL **Eddie Ma and Linseen Lee**, founders, Vigilanti
- 7. POP-UP SHELTERS **Robert Pradolin**, founding board member, Housing All Australians.

Since selection, these seven teams have collaborated (with each other, the City of Sydney, financial advisors, and other select professionals) in a series of workshops refining and elaborating upon their initial proposals. Since these teams are not competing against each other for some final 'prize', there has been much sharing of knowledge and a great cross-fertilisation across teams.

Following five all-day workshops, with time in between for further work and refinement, the seven teams successfully presented their elaborated proposals to a public gathering of over 500 people in the Sydney Town Hall on 15 November, as part of the 2019 Sydney Architecture Festival. They are now finalising their presentations for an exhibition to be held in March/April 2020. For more details please see the City of Sydney website.\*

As an architect, educator and writer I have developed and harnessed my skills to prepare an informed and intelligent framework for such a broad reaching challenge. I am proud of the work completed in this regard, and I am very pleased with the proposals that have been selected.

It has been extremely satisfying to pull all the pieces together to make such a unique approach work, and it was a special form of education to sit 'behind the scenes' as the jury worked their way through the selection process. It was a pleasure to work with the City of Sydney, one of the few organisations around the country who understand and value the architectural competition process.

Stephen Varady is a successful and respected Australian architect, designer, educator, writer and critic. He is a practicing registered architect with over 32 years of experience, and is director of Stephen Varady Associates, a practice for architecture, design, consulting and special projects.

\* <https://www.cityofsydney.nsw.gov.au/vision/planning-for-2050/alternative-housing>

# Wikitecture by the open source architect

HY William Chan

Open source approaches and technologies are transforming the way architecture is being produced and consumed. With over half of the global population gaining access to the internet and the internet of things, new technologies and platforms make it more accessible for us to share, connect and create than ever before. It enables architectural designs, drawings and blueprints to be freely and openly downloaded by not only architects but also non-architects.

But how many architects are willingly sharing their designs, documentation and data to be accessed by all? This is a particular concern when design excellence is defined by an architect's craft and creative practice, when the profession has an undeniable obsession and culture of architectural competition rather than shared collaboration, and when the business of architectural practice relies on protecting intellectual property. We may begin to see the profession losing its relevance if downloadable architectural blueprints become commonplace, threatening the very role architects play.

## *CREATOR VS CONSUMER*

One Pritzker Prize-winning architect did exactly that in 2016. Alejandro Aravena released his practice Elemental's highly regarded 'incremental' social housing plans, elevations and sections to the public sphere for open source use. Accompanying the DWG files<sup>1</sup> available from the firm's website is this explanation:

'Here you will find four examples, with four different designs that pursue the same goals and principles. From now on they are public knowledge, an open source that we hope will be able to rule out one more excuse for why markets and governments don't move in this direction to tackle the challenge of massive rapid urbanisation.'

Such an approach addresses the cultural and technological drivers of change in the rise of individualism and 'makers'. It shifts away from the top-down consumption towards bottom-up creation and construction. It empowers and enables individuals to share, collaborate and adapt designs as part of the makers and DIY movement. Individuals are transformed from consumer to creator, shifting the established power (once) held by professionals and experts such as architects. This is particularly the case in Aravena's example, where increasing access to architecture, including social housing templates, benefits our cities' marginalised populations the most.

## *DEMOCRATISING DESIGN*

Just by putting your drawings online however doesn't make it entirely 'open source', because there are still barriers to traditional methods of construction. This is where 3D printers, laser cutters and CNC machines come in to bridge the gap as these tools transform the digital into the physical. Not only can people gain access to readily available and effective designs, they can also physically make and construct these designs for the built environment.

One of my current projects explores this type of design inclusion and empowerment from open source technologies. Over the past two years, I have been working with refugee communities in developing an open source desktop tool that transforms plastic waste into 3D printing filament. The ambition for this personal 'mini-factory' is for refugees to build the tool themselves from locally sourced materials, using readily available instructions online. They then design and print architectural and construction elements to improve their own built environment, in the refugee camps where they live.<sup>2</sup> In Greece, refugees are able to learn to use 3D printers in dedicated Maker Spaces and Fablabs, designing and 3D



In 2016, Pritzker Prize-winner Alejandro Aravena released his practice Elemental's highly regarded 'incremental' social housing plans, elevations and sections to the public sphere for open source use. These 'half-finished' housing units are incomplete by design in order to give homeowners more space later Photo: © Cristobal Palma

printing efficient construction joints and locks for their shelters.

Architecture and design becomes democratised because the end user, as creator, has agency to solve their own built environment needs at an individual scale. Through Creative Commons licenses, people also have the freedom to change and further develop existing designs to suit their own needs, with permission for their own creative license. Powerfully, as these technological tools continue to advance, so will the ability for the mass customisation of architectural products and its cost effectiveness of production. It disrupts traditional production, manufacturing and construction techniques by rejecting mass production, resulting in architecture that is rightly contextual and personally meaningful.



Output from LATRA's 3D printing program for refugees at Kara Tepe Refugee Camp, Lesbos, Greece

### AN OPEN FUTURE

Open source approaches to architecture and construction 'open' up the profession to a new generation of designers, promoting greater accessibility and inclusiveness to architecture. It advocates the value of great architecture and design to an audience of non-architects, furthering the industry beyond those who can afford to have access to our skills, knowledge and creativity. A culture of open sharing and collaboration will also enhance interdisciplinary solutions beyond our industry's silos, challenging us to collectively create better and more user-centred outcomes for the built environment.

What better way for everyone to contribute and add value to our built environment than the opportunity to do it yourself?

HY William Chan is a designer at Cox Architecture and fellow in sustainable cities with the UN Sustainable Development Solutions Network. He was featured in the 2019 Forbes 30 Under 30 Asia list in the industry, manufacturing and energy category.

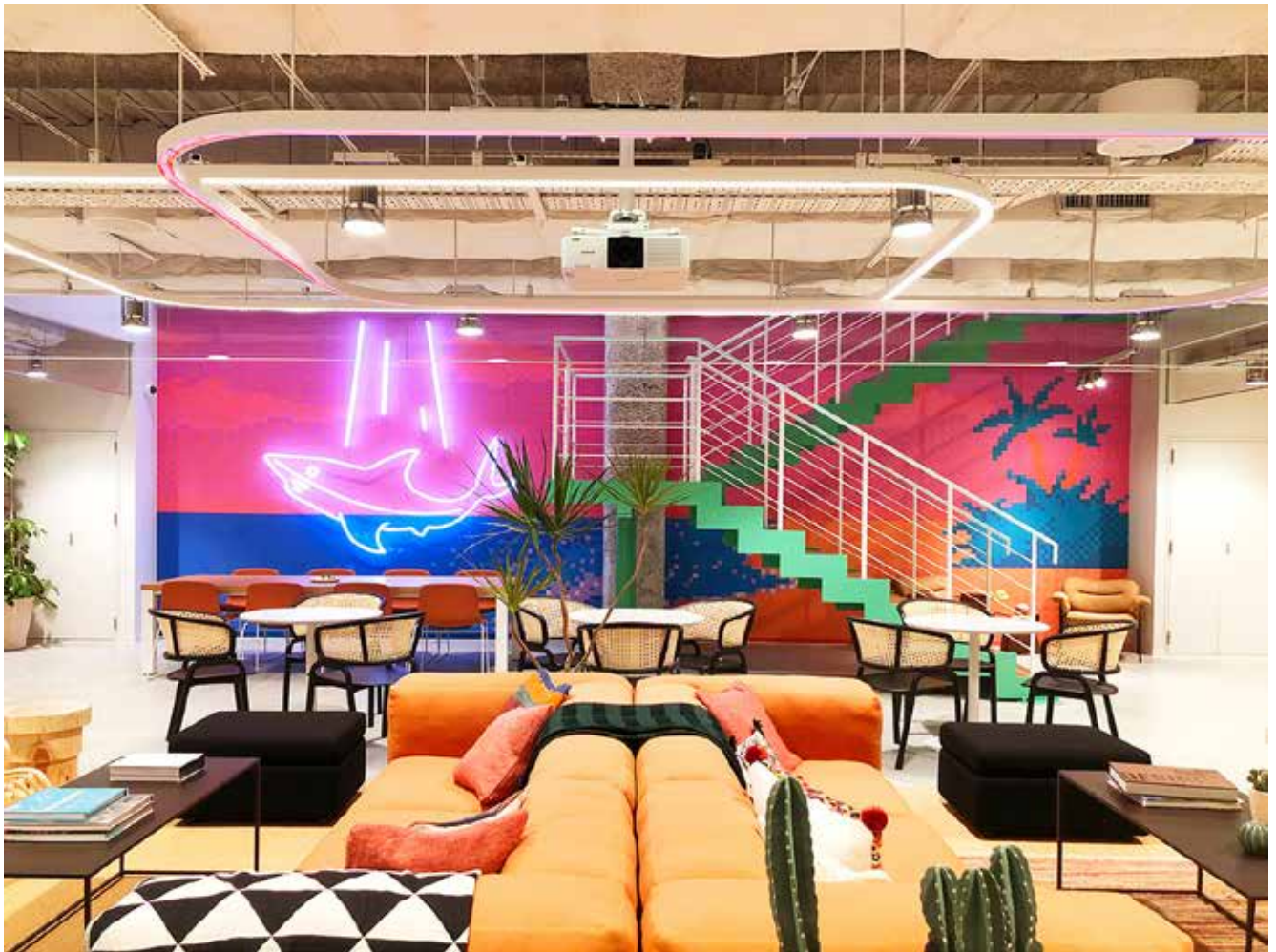
#### NOTES

1. The drawings of Elemental's four Incremental Housing projects can be accessed from: [www.elementalchile.cl/en](http://www.elementalchile.cl/en)
2. 'Refugees as architects of their city and future', [www.ted.com/talks/hy\\_william\\_chan\\_refugees\\_as\\_architects\\_of\\_their\\_city\\_and\\_future](https://www.ted.com/talks/hy_william_chan_refugees_as_architects_of_their_city_and_future)



# Do we need workplace designers in the future?

Jamileh Jahangiri



A WeWork interior showing *Shark neon + Pixel wallpaper* by Asuka Watanabe Photo: licensed under CC BY-NC-ND 4.0



Workplace architects and designers are facing threats from entrepreneurial conceptions of workplace design embodied by companies such as WeWork. Algorithmic design proposes to replace conventional design expertise with a sophisticated formulaic approach that promises flexibility and customisation but may in fact deliver a one-product-fits-all mentality. I spoke to some designers, clients, researchers and tenants involved in the creation of innovative workplaces to understand their view on the future of workplace design and how the algorithmic design is changing the architect's role in the future. They included Cox director and workplace designer Brooke Lloyd, Hassell interior designer Grace Tham, Arup's NSW region leader Andrew Pettifer, the New York based WeWork design director Elise Cuneo and computational design researcher Anastasia Globa.

The conversation starts on the concept of the changing nature of the workforce on one side and the disruption from business models such as WeWork on the other. I asked if we will eventually see the end of a need for workplace architects and designers.

Andrew Pettifer and Brooke Lloyd both believe that although the popularity of the WeWork model has increased quickly in a short time, there are always going to be a minority portion of the market, such as enterprises and individuals, that are fine with a semi-generic WeWork environment.

Elise Cuneo, who worked on both sides of the fence within a traditional design environment and is now at WeWork, believes that although she does use a vast amount of intelligent technologies, the human touch has not and will not go away. According to her, particularly when working with enterprise members, there is a need for designers to ask the questions, do research and solve the problems to respond to new work strategies and provide design solutions that support the expectations a client has for their workplace. This ensures the right mix of settings and supports workplace wellness and the expectations of the various generations that may be inhabiting the space. Similarly, Grace Tham is anticipating an evolution in the roles and responsibilities of workplace designers. She believes that there will always be a need for a

human to craft places because we are not just designing for machines or for a system.

For Anastasia Globa, the role of designers will shift dramatically, moving away from creating particular case-based outputs towards the development of highly customisable systems and adaptable solutions. But she still foresees the need for designers who could craft workplaces in an informed, efficient and aesthetically pleasing way in the foreseeable future.

From the responses above, it seems none of the participants foresee an end to the need for designers in the future. Would they see a real role for algorithmic design, design automation, artificial intelligence and data science in office design? And if so, how can they improve the future of workplace design?

Tham believes that while technology can help us process and organise information, it still relies on human intervention to unlock the meaning, intent and purpose of things. Using an increasing opportunity of data, science and automation to address repetitive and mundane tasks frees up more of our time and energy as designers to push the boundaries of curiosity, creativity and imagination. In workplace design, this tension drives us to create places of work that are both beautiful and beneficial. For Cuneo, it is extremely important to ensure consistency of product, based on proven data and metrics across a global market, when looking at a product like WeWork. Having also worked closely with some large tech clients, she also sees value in using these tools for developing the core 'kit of parts' when thinking about a global set of standards and guidelines for workplace design where consistency is critical. Yet, having worked on many of these project types as well as having toured many Silicon Valley HQs, she sees the human touch in all those places. She thinks the tools are important when ensuring the effectiveness of the workplace environment and thinking about real estate; they assist in thinking about the wider community or the masterplan of an organisation and its workplace environments outside of a purely single location.

*‘Technology can be used to provide speculation of the future based on historical data. But it may be flawed in predicting a future that has not yet happened, as these predictive outcomes are only ever seen through the lens of our needs and knowledge of “today”.’*

For Pettifer, who commissioned Hassell in 2011 to create a work strategy for Arup, data collections have some value when used to optimise how a workplace can work but they do not take away the design need. However, he adds, ‘if the only thing you do is measure the past and try to use that to reflect the future, how do you change it from what it was in the past?’

Both Lloyd and Globa give more credit to the importance of artificial intelligence and algorithm design. Lloyd considers that there is a raft of opportunities to be discovered through data-driven design which is yet to be fully experienced. She gave some examples of current emerging technology that not only tracks space and work setting utilisation but also the health of its occupants. Apps can help people with neurological differences – such as autism, ADHD and dyslexia – to communicate more easily; spaces such as Yahoo’s Neurodiversity Employee Resource Group in Paris also use technology to tackle the issue of cognitive diversity in the workplace. Lloyd is optimistic about future technologies in a workplace where one can track spikes in stress and suggest solutions to mitigate.

**All the participants are expecting some sort of intervention by AI and data information in the future of the design. I asked them to what extent these intelligence technologies might be used to predict workplace needs.**

Globa starts with urging us to think that the predictive capabilities of deep learning neural networks should not be underestimated. ‘The more samples you feed into the system, the better results you will get’, she argues. So, with time, artificial intelligence should be able to predict workplace needs very accurately.

Pettifer however cannot imagine how a computer can understand the culture of an organisation and the emotion you are trying to create through factors such as colour and spatial relationships. He considers a data driven approach to be helpful for establishing aspects of the design brief and analysing how space is actually used. He reminds us again

that this is not design, which is a highly creative and emotional process that cannot be replicated by computers.

For Tham and Lloyd, automated systems and intelligence technologies can only predict things based on past and present data. According to Tham, we only know what we know and our input into the intelligence technology is limited by that. In that way, technology can be used to provide speculation of the future based on historical data. But it may be flawed in predicting a future that has not yet happened, as these predictive outcomes are only ever seen through the lens of our needs and knowledge of ‘today’.

**Each of the interviewees has a different level of expectation about how much AI and technology will predict the future. Will the technologies used in this way lead towards a one-fit solution?**

For Lloyd, the risk associated with the possibility of one-fit solutions is why it is vital for us, as designers, to hold onto the craft of design to ensure unique responses are created to respond to unique cultures and clients.

Cuneo and Globa both see technology as an enabler and hope that technologies will lead to true diversity in workplace design by catering to the individuals through a landscape of choice. Globa continues by saying that this can be used as a tool to understand needs and develop efficiencies, but technologies will actually prove that diversity is key to happiness. Globa suggests thinking of it as a ‘fast food’ metaphor where a client would be able to generate their design proposal just like you now can build your own burger, salad or pizza. You have a base (your office space) and then you can choose a sauce (finish materials), type of cheeses (plan arrangement) and your topping (furniture configurations and types). *Voilà*, your customised workplace is ready to go. This probably is not the most amazing and innovative design solution possible but it will work in principle and to some extent be adequate towards occupants’ needs and expectations. Globa believes the role of architects is shifting towards designing adaptable systems rather than designing unique non-reusable workplace solutions.

*'Most current ways of measuring productivity and welfare are either observational or via self-reporting ... many tasks an employee completes in one day can be measured but that may not be a true measure of productivity if we define "productivity" as the measure of impact and meaning of those completed tasks.'*

For Tham, analysing known data and deriving a design outcome based on a median average will probably result in average design. The real opportunity is in using intelligence technologies to enable us to better understand our present and to make better choices for our future.

Pettifer explains this by giving the recent Arup's Sydney and Melbourne office designs as an example on how the use of technology and algorithm created two different designs between the offices, influenced by leaders of each office, the character of each city and the base building's requirements. The Melbourne office is three floors whereas the Sydney office is over five levels. Even if the data and the strategy are the same, it cannot be a fit for purpose for all. He believes that an algorithm wouldn't be able to respond to create this kind of design.

**From all the responses, it seems that no matter in which side of the spectrum you stand, there are not any suggestions for removing the human and design thinking from the workplace design. Is the use of AI simply a marketing tactic to win market share? Or is it possible to measure productivity, welfare or other gains attributable to the use of such technologies?**

Cuneo, Lloyd, Tham and Globa are all hopeful that it is measurable. Cuneo starts with claiming that, from WeWork to Herman Miller, there are some great tools out there that support informed workplace design, including sensors and heat mapping that provide some great insight into how space is being used and therefore inform the future workplace design. She continues by emphasising again that there is always a need to keep the human touch once this data is gathered.

Lloyd steps down a bit and argues that although it is possible to measure a great deal of things, the psychological impact of being watched and monitored is yet to be understood and this will divide many organisations. Similarly, Tham also suspects that it is possible to measure to some extent, but it depends on our definition of 'productivity' and 'welfare' and our ways of measuring them. Most current ways of

measuring productivity and welfare are either observational or via self-reporting. Tham stresses that both have varying baseline measures and can result in data that is subjective and rather open to interpretation. An example she gives is that the many tasks an employee completes in one day can be measured but that may not be a true measure of productivity if we define 'productivity' as the measure of impact and meaning of those completed tasks. Tham concludes that analytics can sometimes be reduced to a sound bite for a marketing tool, but if used properly, it can give us an insightful snapshot into a group of people within a certain context.

Pettifer does not think human productivity is easily measurable in offices. He provides information on previous research conducted by Arup on the post-occupancy evaluation of hundreds of buildings that reveals a direct correlation between how comfortable people think they are and how productive they think they are. The more comfortable they are the more they would say their productivity is improved, but this link is not proven. Pettifer believes that productivity is more driven by culture, leadership and how people feel about the organisation they work for.

**From listening to all the participants, we will always need workplace designers no matter how advanced the AI and technology would travel. Design is a highly creative field and we need a balance between the two to be able to respond to the needs of society.**

Jamileh Jahangiri is a registered architect, sessional academic and EmAGN NSW co-chair. She works at Cox Architecture, predominantly in public sector.

# Cohesive approaches to disruption in architectural practice

Gavin Crump

From the outside, architecture appears to be a highly progressive and organised profession. Having spent the last eight years within its inner workings, I will not be the first to attest that many inefficient practices are rife.

Too often we are waging a failing war against technological disruption, all the while it is only being accelerated by seesawing confidence in the AEC industry. Client and social expectations have finally parted the veils of techno-jargon and countless cases have proven the merits of BIM workflows and digital delivery; the option to ‘fake BIM until make BIM’ is no longer viable.

I propose (as have many others before me) that the only way to maintain or exceed the pace of change is by truly embracing and utilising computational design. This isn’t a new idea by any means – we simply just don’t seem to be buying into it on average. Technically we’re entertaining notions, but culturally we’re burying the elephant in the room – when really, we need to confront it.

BIM usurped CAD, which overshadowed hand drawing – each step further elevated the importance of machine over man. Computational design advances this narrative further by emphasising the use of computer programming (typically using code) to improve, streamline and automate our design processes. Mathematically programmed functions can be encoded into the forms that found our designs, while mundane tasks such as tagging and dimensioning can be automated (leaving more time for us to focus on the quality of our designs).

When I first began my professional career, I will admit that software placed a significant anchor on my creativity. University taught me to design fluidly with my hands, and then reality chained them onto a mouse and keyboard. Just as Neo learnt to bend a spoon in *The Matrix*, I had to learn to ‘bend the BIM’ – literally getting my head out of the box. In

time, computational design tools such as Grasshopper and Dynamo truly elevated my abilities beyond my previously analogue abilities – it just took time, patience and a reframing of my thinking.

BIM was never the enemy; more a crack showing in the floodgates. Tesfit, Finch 3D, Archistar. Look them up – disruption isn’t coming, it’s here.

I am still desperately running along behind the proverbial eight ball of technological disruption – my empathy for my peers often prevents me from keeping pace. What I have come to realise matters most in remaining relevant is awareness, which in turn leads to preparedness. We shouldn’t be riding out this storm of ideas, we should be riding it!

The most common and resounding issue in the industry tends to be our failure to communicate; not to our clients, but to each other. Thought silos, repetitive design reports and reinvented wheels – there are too many echo chambers to list. The solution lies in finding connections between past and future ways of thinking – experience and innovation must become correlated in our present.

We all likely know at least one ‘architectural veteran’; human encyclopedias of details and lessons learnt. In my experience these members of our profession are often suppressing the potential of technological impact, but in fact have so much they could contribute to its trajectory. Unsurprisingly of what we could lose should not snuff out the promise of what we could gain; survival demands adaptation.

Eventually, the floodgates of nostalgia will be brought down by the pressure for profit, so these ideas need to be translated into newer ways of working before this happens. I implore anyone identifying with this position to make an effort to engage with the youth constructively and actively. New generations of architects need and want your guidance (and patience). Your experience is more valuable in more





Computer programming, visual coding, BIM and the built world – all becoming more correlated as the AEC industry and technology progress.

ways than you are given credit for (and probably than you realise).

While coding has become far more approachable in recent years, the same approachability does not always apply to the programmer. Having dived into the world of programming over the last three years, I have encountered many cultural issues including bigotry (inwardly and outwardly directed), merciless use of jargon and ideas often deaf to real world needs.

For laymen to learn, prodigies must teach. On average, coders are failing to meet this social requirement in order to usher in industry progression. Programmers should build for users; without them, the pursuit bolsters little more than ego. A dialogue requires all involved to actively listen; computational designers should make the effort to consider immediately present problems versus only grasping at futuristic straws. Take the time to listen and leverage opinions informed by those with experience, regardless of the tools and methods they used to gain it.

Such players in the technology market as Apple and Google have proven that success to mass adoption lies within simplicity at the level of the consumer. User interfaces (UI) offer a tangible means of interfacing with a complex code behind the scenes, allowing a symbiotic relationship to form between user and programmer. ‘Human UI’ in Grasshopper and ‘data shapes’ in Dynamo are great examples of ways in which to enhance approachability via UIs; they merely require more time to set up as well as open communication between the user and programmer. Programmers working within the AEC industry must prioritise these ways of thinking in order for computational design to truly be accepted by the AEC Industry.

We should aim in all of our pursuits to build bridges, not walls (unless for an actual building, of course). Computa-

tion presents us with so many new means to interact in complex and exciting ways with our designs, as well as automate the more banal aspects of our workflows behind the scenes. Profit cares not for nostalgia; we must keep up with progress by whatever means necessary.

To ignore the merit of technological advances or cocoon oneself within it does little to further the AEC industries’ growth; our only method of survival lies within cohesion. Equal efforts should be taken at all levels to understand, teach and harness the potential that computation provides our industry; a team is only as strong as its weakest member.

I leave you with this thought: engage with the disruptors. More often than not you will find they seek to aid our industry as opposed to reject it. Given enough time, you might even find yourself joining them.

Gavin Crump has spent most of his career working for large practices as an architecturally trained BIM manager, over time becoming more involved in the Australian AEC BIM community. In his spare time, he educates via the ‘Aussie BIM Guru’, a Youtube channel focused on professional BIM workflows and computational design.

# Regaining control

Ben Berwick



A typical apartment lit by a standard window

We know the role of the architect as chief builder and in more modern times as chief orchestrator. With this shift toward orchestration comes the inevitable bout of diversity of services and specialisation. The bevy of complex systems involved in modern planning and construction has resulted in a fattening of the traditional guilds of the profession. There does, however, maintain a section of luminary architecture, well controlled, that we ascribe to. Projects with outcomes benefitting those beyond the direct user, that influence and trickle through industry. By and large, the architect has lost control.

In a practical sense, the service-based architect has derived power and advantage through drawing, on a scale between servitude through dominance; that is, to either draw to serve (pure drafting) or draw to convince (portraying one's ideas/design). Technology and its ease of access has allowed those outside the profession to draw, often times more competently than an architect. This has in turn reduced the demand for the architect and positioned architectural services as niche.

If the role of the architect is to shift to a more dominant standpoint, then it appears simpler for the definition of architecture to shift, rather than the mindset of those involved in our socioeconomic position-based service industry. A surface reading of the thick of building stock plaguing our era sees a level of standardisation, prioritising ease of construction and developer profits over habitable, healthy space.

How do we avoid architecture becoming obsolete? As car manufacturers consider the larger experience of travel in anticipation of autonomous vehicles, away from driver engagement; as the taxi industry becomes absorbed by their digital rivals; as office leasing becomes dominated by *technology* companies; as developers become building designers;

and as the profession of architecture is funneled into a narrow channel of facadism and FSR maximisation.

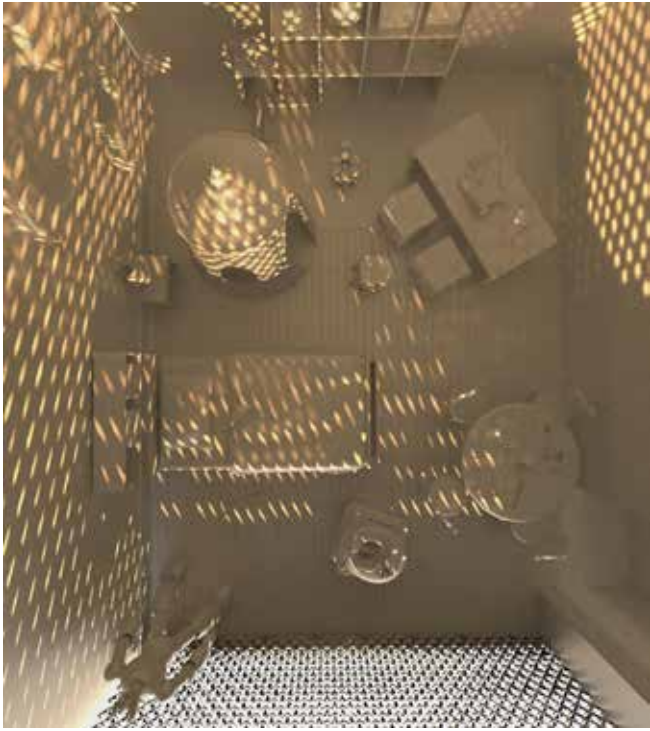
One direction for the future role of the architect could be through technology – creating efficient, durable, standardised building systems. These systems could benefit both the environment and economy if orchestrated well. An alternative would be through diversifying the industry to allow products, retrofit and post-construction personalisation to make the standardised spaces more habitable and healthy.

Architecture becomes most powerful with tangible outcomes. While it is with hesitation that we would propose a physical reality at all – given our ever more prevalent digital lives – we want to share ours, not as the only way toward a future architecture developed with the aid of technology, but merely as one branch in a forest.

54% of the world's population lives in cities. 60% of buildings in-use in the year 2050 have already been built. The dense urban cores in our forever growing cities are largely complete and decaying, or becoming less habitable. The trend in alterations and additions work for an architect is increasing – while necessary, this work is time consuming and slow moving. Can we use technology to spin architecture to be more rapid, more prevalent, less niche and for the benefit of many, for increased habitability and health? To promote the role of the architect as chief builder rather than consultant?

Ecological sustainability has been pushed to the forefront of industries over the past 12 months. Building a new home produces near to 200 tonnes of CO<sub>2</sub> – the environmental impact equivalent to one person living 33 years. The very root of our unsustainable predicament is consumerism.

Architects define what a building is. They began orchestrating the interface between humans and the natural



The same space and time of day using a Solgami screen by Prevalent. With an advanced optical coating on printed solar cells, the Solgami screen replaces window blinds, and gives the user a choice between open, closed or in-between. It allows the occupant to control and generate their own solar power without blocking natural light

environment once caves were obsolete. Given that our work celebrates and relates to the very nature of living, then we could be to blame for the dire circumstances we are in. But we could also change it – if we have control, that is.

**SOLGAMI**

Since 2015, I have led the development of a solar origami window blind. Solgami is a 20 mm deep, pass-through solar retrofit device for windows that links greater natural illumination of an internal environment with energy generation. It uses an advanced optical coating on a printed solar cell that splits light between visible and infrared spectrums, reflecting the former, absorbing the latter. Solar energy generation and health are linked in one move.

The screen is made of a series of apertures that, when concertinaed by the user between open and closed, cast various light patterns into the room through reflection as a physical manifestation of energy generation. The user, experiencing vibrant redirected light patterns in their room, gains an ethical, morally enlightening feeling knowing that the light falling onto them and their furniture has been split and sent to the grid to power their daily activities. This gives us agency, allowing us to retrofit habitable living on top of the layer of standardised dwellings that make up most of inhabited spaces. It is phenomenal energy generation.

Ben Berwick (director of Prevalent) graduated from the University of Tokyo in 2015 with a masters degree of engineering, in advanced architecture and urbanism. Solgami was a prototype winner of the 2019 Lexus Design Award and the project is set to continue development with the support of UNSW and the University of Sydney, under the federal government's agenda of advanced manufacturing.

*‘One direction for the future role of the architect could be through technology – creating efficient, durable, standardised building systems. These systems could benefit both the environment and economy if orchestrated well. An alternative would be through diversifying the industry to allow products, retrofit and post-construction personalisation to make the standardised spaces more habitable and healthy.’*

# Mutations/Creations



*Mutations/Creations: Coding the World* exhibition at the Centre Pompidou in Paris in 2018 Photo: Melika Aljukic

documenting  
the history  
of the future  
at the Centre  
Pompidou  
Melika Aljukic

*Mutations/Creations* is an annual event at the Centre Pompidou launched in 2017 dedicated to the transformations of creative fields driven by the influence of digital cultures. The event includes staged thematic and monographic exhibitions around meetings and workshops that act as an incubator for demonstrating prototypes, carrying out artistic experiments *in vivo* and talking with designers. Drawing on different creative industries, this platform is planned as a critical observatory and a tool for analysing the impact of creation on society. Each event is approached with a timeline of the inherent inventions that laid the groundwork for the technology that exists today. The event highlights social, economic and political effects of these industrial developments and their ethical limits. Technical and scientific progress concerns formal transformations traced in music, art, design and architecture.

The first edition of *Mutations/Creations* opened with the exhibition *Printing the World* in 2017 dedicated to designing and production methods integrating 3D printing. The exhibition curated by Marie-Ange Brayer and associate curator Olivier Zeitoun foregrounds digital 3D printing technologies as a prelude to a fourth industrial revolution. The timeline of the exhibition shows the status of works and the creators now within the automated open-source platform. The realisation of the projects exhibited within the last five years attests to the speed of technological development and integration into pioneering prototypes. The projects include 3D printing concrete prototypes that suggest the constructive possibilities of large-scale additive manufacturing. The exhibition marks the beginning of 3D

digital printing with the ‘photosculpture’ from 1860 by François Willème, who used a photograph and a pantograph as an instrument to trace an image at a different scale for 3D modelling of the human body. 150 years on, the new developments present the limit in 3D printing architecture defined by an architect’s understanding of the possibilities of computational design and making of the custom tools to ensure control of the project.

*Coding the World* is the second edition of the *Mutations/Creations* cycle in 2018 dedicated to numeric code and digital writing. This exhibition curated by Frédéric Migayrou presents the creative uses of coding through six large chronicles of contemporary creations: numbers, codes and programs; the Algorists; text, code, literature; music; architecture – design; and body and code. *Coding the World*’s journey through the history of the development of information technologies in different creative industries, highlights the upsurge of digital technology within different design areas and unlocks new possibilities of interaction between these fields. The creators, including visual artists, composers and musicians, poets and authors, dancers and choreographers, architects and designers have progressively incorporated programming language into their work and experimentation process. The exhibition timeline retraces the digital code and scripting within a history of calculation, logic and algorithmics that began with the invention of first calculating machines in the 17th century by philosophers Blaise Pascal and Gottfried Wilhelm Leibniz. The code is first related to the analytical engine designed by Charles Babbage in 1834. Following the first program devised by Ada



Lovelace, the foundations of programming language were laid by the binary logic of Boolean algebra which received the mechanical form as punched cards, opening the way to Alan Turing's Universal Machine in 1936. The code that becomes autonomous in the form of programming from the 1960s is essential in areas of experimentation and creation when computers became available to the general public. From programmed art in the 1960s to the formalisation of notation, the exhibition portrays the field opened with computational tools for vast interdisciplinary experiments that question our daily use of information technologies.

Following the Second World War, the computer escaped its confinement to military usage and became more widely accessible through universities and computer science laboratories. Collaborations between artists and scientists explore the possibilities offered by the digital world. From the formation of the pioneering team at the Bell Labs in the United States emerged the first generation of computer artists, making creative use of the machine's power of calculation. The concept of programmed art emerged in 1968 with the Algorists' exhibition *Arte Programmata* organised by Bruno Munari. The essay featured in the exhibition catalogue by Umberto Eco highlights the concept of 'the open work'. This was followed by Jasia Reichardt's *Cybernetic Serendipity* in 1968, Groupe d'Art at Informatique de Vincennes formed in France in the wake of May '68, and Nove Tendencije an international group of artists formed in the 1960s in Zagreb, confirming the international reach of the art informed by constructivist and kinetic art predecessors. Publications like Croatia's multilingual magazine *Bit* theorise and diffuse digital aesthetics. The historical avant-garde movements' numerous experiments with text and the appearance of the computer and digital technology create different ways of reading and writing. The relationship between natural and artificial languages and experimentation generates works like generative literature, animated poetry and hypertexts that revisit the status of author and reader.

Although architects were quick to interest themselves in the possibilities of automated data processing like Richard B. Fuller, it was Pierre Bézier's pioneering use of computers for drawing and modelling and other early developments in computer-aided design (CAD) that began an architectural collaboration with leading computer science laboratories. Bézier, working as an engineer at Renault, developed a system of 3D surface modelling that can guide numerically controlled machine tools. His research led to the creation of Unisurf CAD program in 1966. The exhibition documents the early 1970s as a new generation that started using dynamic CAD tools that could be parameterised and modified by users. With the digital revolution in the 1990s, emerged new programs like Form Z and Catia for the development of digital forms by architects like Cedric Price, John Frazer, Peter Eisenman, Frank Gehry and Greg Lynn. From the 2000s onward, architects created programs that directly control production tools, such as the Grasshopper visual programming language developed by David Rutten in 2007, and Processing programming language designed in 2001 as an open-source interactive design by Casey Reas and Ben Fry. Progressive access to new programs laid the foundation for

new digital design processes such as *Studies on Optimisation: computational chair design using genetic algorithms* by EZCT Architecture & Design Research, that consider a voxel space in which a population of 100 chairs is defined using genetic algorithms and digital crossing to give rise to a new generation of hybrids.

The chronology of music in *Coding the World* is related to theory and mathematical formalisation since the 18th century that reveals the existence of models and systems based on coding. The timeline begins from the combinatory vision of the 17th century to the first mechanical devices to compute music in the 19th century, paving the way for algorithmic composition and the 20th-century research on real-time computing, microcomputing, programming languages, ubiquitous computing, web audio and artificial creativity. Beginning in the 1960s the computer was used to analyse sound, visual and gestural data for dance. Applications of computing were gradually integrated into dance and choreography that generated a new visual vocabulary through the use of sound and digital visual representation. With the advent of new technology in the 2000s, digital space is produced directly on stage.

The third edition of *Mutations/Creations* cycle in 2019, *The Fabric of the Living*, retraces archaeology of the living and artificial life. The exhibition curated by Marie-Ange Brayer and Olivier Zeitoun explores a new interaction emerging between creation and the fields of life science, neuroscience and synthetic biology. Design is explored as a cross-disciplinary approach between biology and genetics like a biotechnological artefact where living matter generates form. The exhibition timeline begins with the discovery of microorganisms through microscopy by Robert Hooke in 1665 and ends with the research on genetic modifications. Design strategies exhibited include the transformation of microorganisms into an architectural medium and building material, and studying the behaviour of life, like animals or plants to produce new forms of nature between the digital ecosystem and living systems. Biomanufacturing from organic life exhibits the potential for new sustainable, biodegradable objects.

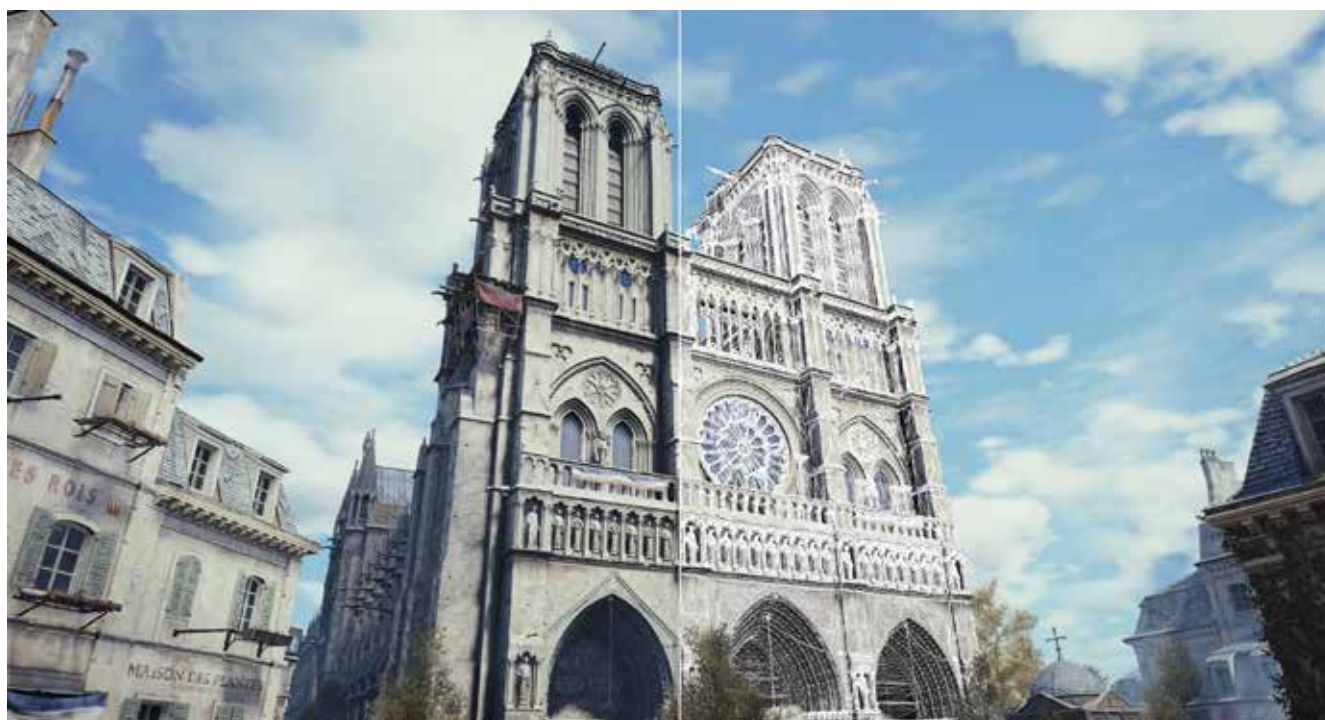
The first three iterations of *Mutations/Creations* at the Centre Pompidou and their publications promote the potential of inherent creation as an evolutionary process determined by technology and in turn, attempt to stimulate new explorations at the limit of its technological possibilities. Ultimately, the event reflects that rethinking architecture with digital means demands response informed by the challenges of the architectural practice today within its epoch. The fourth exhibition of *Mutations/Creations: Neurons, Simulated Intelligence* curated by Frédéric Migayrou on technologies for simulating intelligence will take place from 26 February to 20 April 2020 at the Centre Pompidou.

Melika Aljukic is the principal of architecture and urban design practice Melika Aljukic Architects. She is a member of the Australian Institute of Architects NSW Chapter's editorial committee and heritage committee. Melika graduated from the UNSW with Bachelor of Architecture First Class Honours and holds a Master in Architecture (Architecture and Urbanism) from the Architectural Association. She is currently a PhD (Architecture) candidate at the University of Sydney and sessional academic at the UNSW.



# Heritage: from technophobia to technophilia?

Hugo Chan



Notre Dame de Paris as viewed in *Assassin's Creed Unity* Photo: Ubisoft Montreal

The word 'heritage' is not one which would immediately float to the fore in any discussion of the future or of technology. Sometimes unfairly considered in terms of historical protectionism, heritage might, as historian David Lowenthal suggests, be a kind of 'technophobia: an idealised past [which] replaces a discredited future ... dismayed by technology, [we] hark back to a simpler past whose virtues [we] inflate and whose vices [we] ignore.' It falls perhaps to the realm of either complacency or technophobia which has, at least in part, hindered our ability to consider a host of different technologies as valid, common and essential tools within the day-to-day practice of heritage conservation.

To look at how far heritage conservation practice must advance to catch up to contemporary technology, the NSW Heritage Office's 1998 guideline *How to Prepare Archival Records of Heritage Items* may offer a glimpse into an increasingly distant, rose-tinted past. In it, minimum requirements continue to refer to 35 mm film, colour transparencies and negative prints. Accompanying this, the photographic

recording guidelines (revised in 2006) mercifully provides guidance for digital photographic recording as an alternative to film. While we may be presumptuous in assuming that everyone has moved beyond film, Cracknell & Loneragan (acting as heritage consultants) received this council condition of consent in August 2019:

'Two (2) complete copies of an archival recording of the existing dwellings ... including a set of photographic negatives prior to the commencement of demolition works ... including one set of 35 mm black and white negatives labelled and cross referenced to base plans ... and two copies of proof sheets and select medium format prints showing important details ...'

Reluctantly acquiescing to our office's suggestion of digital archival recording, perhaps when the council realised it no longer possessed a Kodak 35 mm slide and film viewer, this evident copy-and-paste generic conditions exercise demon-



Project Soane's aerial view and main banking hall interior of Sir John Soane's Bank of England

strates not only complacency, but shows that such methodologies do not even begin to touch on the potential myriad of now-staple technologies open to architects and historians.

Quaint as it may be to elevate film as a high art by the nostalgist, the realities of technological advancement and the necessities faced by an ever more complex industry leaves little room for continued dependency upon traditional analysis output methods. With building information modelling (BIM) having unequivocally become an industry based standard in the world of architecture, engineering and construction, HBIM – known also as heritage BIM or historical BIM remains an emergent field with an essentially open-ended realm of possibilities for documenting, analysing and disseminating historic architecture.

Although BIM software was conceived originally for new buildings, a trip into the world of modern gaming reveals its hidden potential for heritage conservation. Ubisoft's highly successful game *Assassin's Creed* transports players not only into the realm of historical fiction, but highly realistic, historically accurate environments of Egypt, France, Italy and China, amongst others. Collaborative team efforts between programmers, visual artists and historians have created highly detailed, wholly immersive environments of history – a plethora of untapped potential with real-world architectural references. Such is the power of these gaming environments that the Notre Dame Cathedral created for *Assassin's Creed Unity* is now part of a digital archive effort aiding in the cathedral's post-fire reconstruction.

Moving from gaming to the industry staple of Autodesk Revit, the two-year multi-phased competition Project Soane also brought to the forefront the potential for HBIM to reconstruct a great lost work – Sir John Soane's Bank of England. Faced with fragmented data, this open-source project brought BIM technicians, architects, visualisers and historians together, united under a single digital environment to piece together this once magnificent 19th century building. Through a collaborative effort, the large lanterned pendentives over the central banking halls were accurately reconstructed in all their sublime qualities of light, realised through a detailed, geolocated, accurate BIM model. The possibilities of interpretive analysis in terms of architectural, engineering, historical and material characteristics were boundless, showing that technology is not incompatible with history.

Aside from recapturing historic buildings now lost, an alternative BIM technology, point cloud modelling, enables an accurate digital imprint of physical fabric to be created. A potential tool for experiencing the city as it was through augmented reality, point cloud modelling provides a 3D scan to reveal hidden details and undiscovered issues; it ultimately creates a universally accessible digital database future-proofed for intergenerational maintenance of our historic buildings. Here is a mode for engaging with how we document, maintain and restore heritage, one with the potential to be holistically integrated into the broader contemporary practice of architecture today.

Clearly, the time is far beyond ripe for heritage practitioners to consider how existing and emergent technologies can and should be integrated into our existing systems of heritage conservation, preservation and management. In his epic poem *Metamorphoses*, Ovid reminds us that '*omnia mutantur, nihil interit*' – everything changes, nothing perishes. Adopting new modes of recording, analysing and representing heritage is not to suggest some irretrievable loss of our cultural legacy, but rather, a call to embrace opportunities and fundamentally rethink how heritage should be critically analysed and immersively experienced. As more and more buildings become heritage listed and retention rather than demolition becomes seen as a sustainable way of developing our cities, new tools and technologies must be integrated into the chain of conservation and adaptation. If 'frivolous' millennial gamers can roam the alleys of 15th-century Venice, fight their way through revolutionary France or abseil the roofs of Victorian London – all in 4K ultra high definition – then is it not time for us as architectural practitioners to consider the power and potential of a city's narrative to be recorded, analysed, experienced and explored in virtual reality?

Hugo Chan is architect and associate, practice management at Cracknell & Lonergan Architects and an architect of his own research-based practice Studio HC.

The images of Project Soane have been reproduced for this publication with the generous permission of Andrew Milburn, educator and architect. More information on Project Soane may be found on <https://projectsoane.wordpress.com>. More information on Andrew's work, including his explorations on the possibilities of Revit, can be accessed via <http://grevity.blogspot.com>. The *Assassin's Creed* image has been reproduced for this publication with the permission of Ubisoft Montreal.

# The great debate:

## Will artificial intelligence and robotics fundamentally re-shape the construction industry?

Review by Sarah Lawlor

Where industries like medicine and mining have been transformed by advances in artificial intelligence (AI) and robotics, the construction industry, at least in Australia (described in this debate as the ‘Australia bubble’) has been slow to take up this technology in a significant way. The architecture industry has embraced new technologies of parametric design and robotics, yet it struggles with the ethical questions around the importance of empathetic, ‘human-centred’ design, and whether algorithmic design can replace architects.

On 13 November 2019, the National Association of Women in Construction (NAWIC) hosted a debate on the question: ‘Will AI and robotics fundamentally re-shape the construction industry?’ Moderated by Natasha Devlin of Investa Property Group, the debate was argued by Liz Partridge (Health Infrastructure), Daniel Kalnins (Willow) and Georgina North (Laing O’Rourke Engineering Excellence Group) for the affirmative, and Simon Trimmel Ritchard (Multiplex), Eoin Daniels (Top Knot Carpentry & Joinery) and Lucy Burnitt (Dexus) on the negative team.

The affirmative team suggested many people likely feel both excited by the prospects of AI and concerned about its implications, a position they appealed to in their opening argument when Partridge quoted Stephen Hawking:

‘Success in creating effective AI could be the biggest event in the history of our civilisation. Or the worst. We just don’t know. So we cannot know if we will be infinitely helped by AI, or ignored by it and side-lined, or

conceivably destroyed by it. We simply need to be aware of the dangers, identify them, employ the best possible practice and management, and prepare for its consequences well in advance.’

Shifting the argument away from possible eventualities foreshadowed by years of sci-fi thrillers, the debate concentrated its argument around the extent of change that AI could affect the construction industry, without reflecting on what the speed of that change or what the value of that change may be. The affirmative team argued that AI and AI-driven robotics will change what we build, how we build and how we work, and that those three elements will create a seismic shift in the industry.

AI and robotics are, of course, already being used in industries such as manufacturing, finance and mining. As the requirements of these industries and our client industries change, what we build for these groups must also change. Partridge gave an example from the health sector, where a recent study has found that AI and digital tools identified skin cancers in 95% of cases, compared to 86% by dermatologists. How then do these kind of developments affect buildings? If annual skin checks can be more accurately conducted by an iPhone, then less consulting rooms are needed, and skin cancers are detected earlier leading to reduced sickness and fewer hospital beds. This results in changing design requirements for physical spaces.

The affirmative team also argued that AI and robotics will change how we build. Robotics are being utilised in the





Lucy Burnitt presents for the negative team at the debate held last November at the National Association of Women in Construction  
All photos: Alex Donnini Photography and courtesy NAWIC

construction industry via digital fabrication, such as 3D printing. In recent years, 3D printing has been used to build complex forms unable to be constructed using traditional methods but has had little real-world application on typical building sites. However, digital fabrication is now being looked at to reduce wastage. This advanced form of building automation no longer restricts designers to work with standardised modules or material sizes but can build complex and bespoke designs without wastage – an advantage that needs to be capitalised on as we move towards a more sustainable future.

While the negative team did not dispute that AI and robotics would be utilised by the construction industry, they instead suggested that these developments would simply become part of the industry ‘toolkit’ that would augment and enhance the workforce rather than fundamentally changing an industry underpinned by skilled and passionate people. The pillars to their argument were that dynamic projects require agile people to steer projects through their various challenges, that projects are unique and rarely standardised or replicated, and that the cost of AI is prohibitive to its wide uptake in the industry. However, I believe we are already seeing some of these arguments disproven. Rather than automation being used simply for repetitive tasks, we are now seeing robots taking over the activities of highly skilled practitioners, such as surgeons. Similarly, in fabrication, technological advances now mean that robots are able to build complex forms without any negative impact on time or material efficiency.

As AI becomes more prevalent, we need to ensure humans remain in the loop to create good ethical frameworks around the use of this technology. The affirmative team referenced the recent World Economic Forum report that predicted 65% of all children currently in primary school are likely to have jobs that don’t exist yet, but they suggested there are opportunities for all of us to partner with AI in a changing industry. The debate did not consider a value judgement about the use of AI, and while the negative team officially won the night – based on some clever arguments and gags – there is little doubt that fundamental change by AI is inevitable, and as such, the affirmative team’s case lingers.

Sarah Lawlor is a senior architect at FJMT Studio and a member of the *Architecture Bulletin’s* editorial committee.



Debate teams, L to R: negative – Eoin Daniels, Lucy Burnitt, Simon Trimmel Ritchard; and affirmative – Liz Partridge, Daniel Kalnins, Georgina North

# Interactions of the future

Sarah Gilder

Technology continues to drive change in the architecture and construction industries. Not only because it is facilitating rationalised, intelligent workflows, expanded communication and agile practices, but because architects (as thought leaders) should be proactive rather than reactive.

Fifteen years ago, I encountered an inspiring group of researchers from RMIT Spatial Information Architecture Laboratory (SIAL). It was their premise that handing over aerospace design technologies to practicing designers (like me) would enable change to established design workflows. Within the framework of PhD research, tacit knowledge would be captured to inform processes in the future.

Within the course of research, we learnt techniques in CATIA, scripting and programming. At its core, the research focused on these studies in digital technique. However, an unexpected outcome was the human aspect of the study, which included enhanced communication and people skills, and a cultural shift.

Concluding the PhD studies after much intense scrutiny of my practice and colleagues, it was reassuring to reflect on the positive advancements made; within only three years of the provocation, our entire studio shifted its culture of fearing unknown technologies, to embracing and acquiring a proactive cultural appreciation. Integrating new technologies did not mean the loss of the idiosyncratic design approach but rather, we gained an appreciation of how technology can symbiotically enhance the design process.

During the research I found an image used by Negroponte in *The Architecture Machine*, conveying the feedback loop within a design process between a machine and the thinking process. His book explored the complex

relationship required to integrate artificial intelligence in design. This relationship can be considered as a symbiotic interchange, where the machine is informed by the designer and the designer learns from the machine. It was clear that a machine could master repetitive procedures but had a fair way to go to integrate more challenging parameters such as context, non-sequentiality, nuance and bodily movement. All aspects inherent in human interaction.

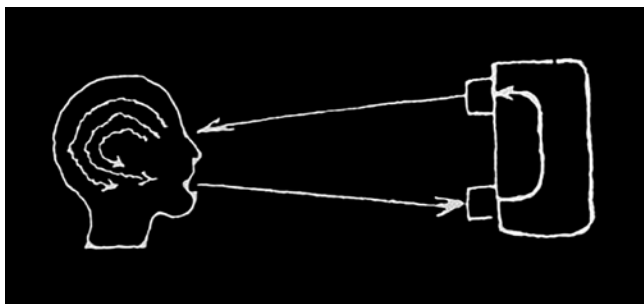
At the 2019 NAWIC debate questioning 'Will artificial intelligence fundamentally change the construction industry?', the discussion conveyed that while it was impressive that robotic technologies can fulfil roles on site (like digging holes or placing material in complex ways), construction is also about people management. People manage personalities, expectations and regulations. They then apply these outcomes to site and physically build spaces. While we are closer than we were in the 1970s, we are yet to have available artificially intelligent methodologies to help us to excel in doing all that is required.

Through decades of research and practice, we have seen outcomes of integrating digital technologies into architecture and construction. For example, 15 years ago parametricism was predicted to revolutionise design. Now it is used every day in practice. There should be no doubt that artificial intelligence is the future of the architecture and construction industry and as such we can confidently seek opportunities for innovation as part of an everyday approach.

What we need to embrace for our future is that technology exists and changes occur. For the survival of our industry we must adopt technology to its fullest capacity or risk extinction.

It also remains that it is the people behind the technology that need to be continuously curious. We need to continue to work symbiotically with technology to more readily question 'where and how we, as designers and contractors, position ourselves to strategically gain the best out of whatever the future will bring'.

Dr Sarah Gilder is a design architect at 3XN/GXN and a PhD graduate of the Spatial Information Architecture Laboratory (SIAL) at RMIT.



In the above Yershov Diagram (1963), A P Yershóv described automation typology as the director-agent model of interaction. Nicholas Negroponte incorporated the diagram in *The Architecture Machine* (1970)



# The second turn of non-standard architecture

Melika Aljukic



Morpheus Hotel by Zaha Hadid Architects in Macau, 2019 Photo: Ivan Dupont

In this article, I will present my research which is a novel interpretation on the inherent lineage in the geometry of architecture developed through architectural epochs, beginning with the seminal work of Leon Battista Alberti in the Renaissance, through to baroque and modernist theory and practice. It identifies the beginning of parametrisation with the formation of the disciplinary and professional territory of architecture with Alberti's writings in 16th century and the diffusion of classical notions of aesthetic theory, tracing its genealogy and its limits through into the 'second turn of non-standard architecture' in the 21st century by way of 17th and 18th mannerist and baroque architecture that eventually prevailed in the claim for the constructive capacity of parametric geometries in 'non-standard architecture'. Frédéric Migayrou defines non-standard architecture in two fields of knowledge. In its formulation, it is 'a refusal of normalisation, of widespread standardisation, as a determining principle of Modernism.'<sup>1</sup> Non-standard also 'opposes the formalism of mathematical language, focused on its own objectivity by introducing open, infinitesimal models' based

on 'non-standard analysis' by Abraham Robinson.<sup>2</sup> It posits a 'dynamic structuralism' that underpins the interrelation of phenomena and meaning found in the mathematical models of morphogenesis by René Thom.

My research identifies the shift in non-standard architecture to what the research calls the second turn of non-standard architecture, as an architectural epoch beginning in 2012 with a distinct moment in the development of parametric architecture towards innovative formal possibilities. This second turn aims to realise parametric architecture through novel methods of form finding and constructional methods that deploy parametric data models and robotics. The research contributes to knowledge by tying the first and second turn of non-standard architecture to the history of geometry and parametrisation from Alberti. A useful precedent is the parametric data model developed for the Morpheus Hotel by Zaha Hadid Architects that explores non-standard parametric forms. (It is a building that I worked on which was completed in 2019.) This architectural epoch is distinguished by the architect's role for understanding

possibilities of computational design as part of the making of the custom tools within an architectural practice structure that has changed in response to computational design.

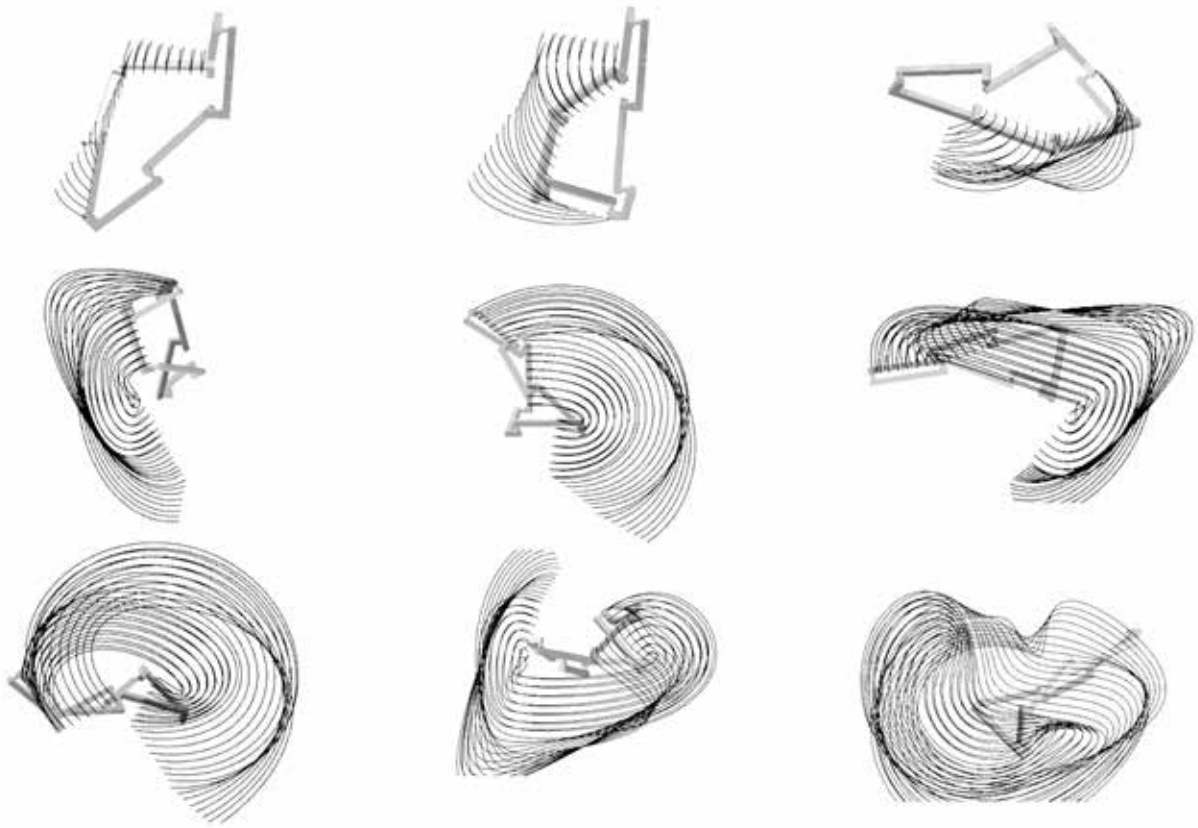
Computation has redefined architecture. A parametric data model is a new form of communication and collaboration between architect and engineer. The Morpheus Hotel is an innovative tower typology characterised by an external load-bearing steel structure in the form of a free-form high-rise exoskeleton with steel and glass lattice shell for the 160-metre high tower.<sup>3</sup> The rectangular extruded block has three voids integrated between the two reinforced concrete cores linked in lower and upper storeys, as well as externally with the aluminium clad exoskeleton. The Morpheus Hotel exoskeleton design morphs from the external flat facade areas into the central building section. The design methodology is parametric digital modelling and algorithmic computational design processes in Robert McNeel & Associates' Rhinoceros, which have benefits for cross-discipline collaboration, parametric object behaviour and coordination through automated recalibration. Exoskeleton architectural design and structural analysis is developed with the new 3D digital techniques that integrates mathematical geometry for curved surfaces and finite element analysis (FEM). Design and development of the new tools as part of the digital process was imperative for the new architectural typology. Promoting these advances in computational analytics and optimised techniques, Patrik Schumacher 're-launched' the style of Zaha Hadid Architects in 2016 into Parametricism 2.0.<sup>4</sup> Although the protocol for design and documentation of the Morpheus project was a highly digital and integrated parametric data model, fabrication of components retained a high level of skilled manual work. Non-standard architecture projects remain constrained by the technical limitations preventing digital fabrication. Instead, these projects were and continue to be predominantly handbuilt using conventional methods of construction. The research identifies a limit in the second turn of non-standard architecture is the implementation of robotic automation for construction. Examples of such robotic fabrication exist in the automotive industry.

Following the developments of automated manufacturing processes in Japan from the 1960s, research into realising non-standard forms in architecture with robotic automation has been undertaken across various universities since 2008 – for example, by Fabio Gramazio and Matthias Kohler at the University of ETH integrating six-axis industrial robot for bricklaying.<sup>5</sup> These investigations have led to the development of functionally graded concrete (FGC), where the chemical mix and location of reinforcement are assigned non-uniformly according to the required structural performance of architectural components such as columns, beams and walls. The technology of grading provides an innovative possibility to align the internal composition of concrete components by automated construction, to meet defined performance, topology and shape optimisation. My research concerns both, the concept of material optimisation and design optimisation to generate non-standard architecture, proposing that fabrication remains constrained by technical limits that could be traced back to the Euclidean, standard bases of spatial

conception and subsequent manufacture. Material optimisation with FGC is generated by the finite element analysis (FEM) method and incorporates insulation to create monolithic material that functions in multiple ways, structurally and sustainably.<sup>6</sup> The concept of design optimisation in architecture is referred to as a reduction to an improvement of multiple geometric elements analysed within an algorithmic description. The design optimisation of the parametric surface has importance for loadbearing behaviour. The geometry of lightweight surface structures is a form-active or surface-active loadbearing system that carry external loads primarily by tensile or compressive stresses in the tangential direction.<sup>7</sup>

The parametric potential in architecture and urbanism is explored in the research agenda of the Architectural Association Design Research Lab (AADRL) as a platform for generating and testing ideas that become integrated into professional practice. The design project as a form of open research emphasises the particular form of practice and communication between designers, collaborators and clients which can be considered today in terms of contemporary design systems, as well as related to historical precedents within modern architectural discourse. A distinct prototype of the second turn of non-standard architectural epoch is the *ARACHNID/OIDS* robot prototype developed as a part of my academic research at the AA DRL in 2011–13.<sup>8</sup> The novel design proposal is concerned with a proto-design research agenda that investigates computation in the pursuit of systemic design applications that are scenario- and time-based. This AA DRL research project, from a studio directed by Philippe Morel, integrates computational and fabrication methods that combine technology, architecture and mathematics by revisiting research of elementarism in the 1920s and its cybernetic reinterpretations of the 1960s. The parameterisation of the form is achieved by sinusoidal inversion of custom seven-axis robot prototype that integrates kinematics embedded in the kaleidocycle geometry. The 7R-Bricard Linkage robotic apparatus with revolute joints defines the shell as the three-dimensional ruled surface. This new direction in the design of robotic apparatus allows non-standard geometry spatial definition that can further be customised with different degrees of freedom. Generated shell geometry is defined by asymptotic curves within its ruled surface. This contributes to geometry optimisation in architecture with the asymptotic curve as a novel application to load-bearing structures that has advancement for efficient construction. Robotic apparatus envisaged for fabrication in lightweight materials such as carbon fibres, or composites has a multiphase weaving end-effector embedded into each robot linkage. The ruling of the shell surface is obtained by the interlacing of carbon fibre. The parametric data model for the prototype is generated by finite elements of the shell and frame assigned accordingly with the architectural geometry. Nonlinear structural analysis indicates relatively small bending moments within arch surfaces that allow for lightweight shells.

Geometric simulation of the *ARACHNID/OIDS* robot prototype implements the brainwave-reader device in architecture as a new method of architectural codification. This method of the architect's interface codifies the informa-



Drawings of the *ARACHN/OLJOIDS* robot prototype geometry kinematics for shell construction. The 7-linkage robotic apparatus with revolute joints defines the shell as the three-dimensional ruled surface of the third order. Prototype by Melika Aljukic, Margarita De Bruijn, Sreerag Palangat Veetil and Carles Sala. Studio by Philippe Morel assisted by Jose Sanchez on *Reconsidering Elementarism* at the Architectural Association Source: Melika Aljukic et al., *ARACHN/OLJOIDS* (London: Architectural Association, 2013)



Rendering and video of the *ARACHN/OLJOIDS* parametrisation of the three-dimensional ruled surface by Melika Aljukic, Margarita De Bruijn, Sreerag Palangat Veetil and Carles Sala. Studio by Philippe Morel assisted by Jose Sanchez on *Reconsidering Elementarism* at the Architectural Association Source: Melika Aljukic et al., *ARACHN/OLJOIDS* (London: Architectural Association, 2013)

tion for direct spatial movement of geometries in real time. The neural interface works with electroencephalography technology, developed initially for medical purposes, notably in prosthetics control. With the advent in neuroscience, the communication between man and machine is evolving into a symbiotic coexistence. Any emitted signal can be captured and converted instantly into a command task. In architecture, functioning as a generator, this method provides an opportunity to evolve architectural codification as preconditioned input.

With the advancement of computational technology, robotic apparatus presents an answer in the transition from the digital design-production into techniques of fabrication. Philippe Morel claims that in fact, optimisation is inherent within the computation: '[w]ith optimisation, architecture is not just "geometric" [...] even if it is dislocated, also demands an algorithmic description'.<sup>9</sup> For Morel, algorithms are the 'true machines'. Such optimal data can be used as input for the abstract machine in the form of a robotic apparatus for geometrical definition. As a response to the core of technological research that deals with the man-machine interaction and learning when compared to artificial intelligence, the *ARACHN[OL]OIDS* robot prototype asserts the future machine will be developed with the possibility to extend human physical capacities to their limits. In turn, the architecture will upgrade to a state in which it becomes the anterior prosthetic extension of the human body itself. This second turn of non-standard architecture contributes to the lineage of the geometry development in architecture and conditions the automated non-standard. The parametric data model combined with simulation protocol for FGC, and custom

robot prototypes like *ARACHN[OL]OIDS*, will ultimately integrate automation in the construction. The second turn of non-standard architecture attempts to recalibrate architecture at the limit of technology. My research finds that the regulatory environment has changed with the lineage of the geometry development in architecture, and will still need to change in order to allow for non-standard architecture to be constructed. The inherent limit can only be solved by reconsidering existing regulations and implementing developed topologically ecological approaches in architecture.

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NOTES

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3. Zaha Hadid Architects, *Morpheus Hotel at City of Dreams, Macau*, accessed January 13, 2020, <https://www.zaha-hadid.com/architecture/city-of-dreams-hotel-tower-cotai-macau/>.
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Rendering of the geometrical definition through a brainwave interface on site. Video of the robot prototype and machine simulation for the generation of surface geometry. *ARACHN[OL]OIDS* prototype by Melika Aljukic, Margarita De Bruijn, Sreerag Palangat Veetil and Carles Sala. Studio by Philippe Morel assisted by Jose Sanchez on *Reconsidering Elementarism* at the Architectural Association Source: Melika Aljukic et al., *ARACHN[OL]OIDS* (London: Architectural Association, 2013)



# From object to site: returning philosophy to architecture

Andrew Benjamin

When architectural design was organised by the investigation and release of potentialities within software programs, a particular domain of research was identified. That identification delineated one way that the interconnection between architecture and philosophy was then understood. Developed as a result was what could be described as an ontology of techniques. That project need not be abandoned in its entirety. Rather what has occurred is a twofold limitation that can now be imposed on the assumed centrality of that approach. Maintaining an ontology of techniques is no longer the only way of construing the relationship between philosophy and architecture (where that relationship informs architectural theory). Even though interconnected the limitations come from two directions. Firstly, there is the recognition that the use of software to explore the development and manipulation of volumes was reductive. It defined architecture in terms of objects. Form was all. Innovation was equated with appearance. In addition, progress and the progressive were restricted to the appearance of single and singular objects. The second is the impact on both philosophy and design of the climate crisis.

## *DISTANCING THE OBJECT*

As a result of digitally driven design, scaleless objects indifferent to programmatic concerns – objects that were present as much on paper as materially – became the major focus of architectural theory. Once it had been possible to argue (albeit polemically) that the same algorithm allowed as much for generating a teapot as it did a building, where the move from the former to the latter had a seamless quality, the object status of architecture was secured. A status that can then be retroactively applied. The history of architecture became the history of objects. Objects demanded a mode of thought where accounts of both their effectuation and presence predominated. There can be no naivety here. Architecture will always have a fundamental connection to object creation. And yet, there are other possibilities. They exist in how the move from the position that demands the centrality of the object is to be understood while necessitating overcoming that impoverishment of philosophy in which it is orientated by an exclusive concern with objects.

The departures in question, begin with incorporating an object into what can provisionally be called a ‘field’. The object takes on a different quality. It is not incorporated into a field to provide a form of contextualisation. Indeed, the separation allowing for contextualisation is part of what is being refused. In fact the contrary is the case: the object takes on the quality of an *after-effect* and has to be understood as resulting from a process of individuation within that field. The field individuates the object. The object – the building – is an *after-effect* of a network of relations. What matters therefore is twofold. Firstly, there is the primacy of the relation between object and field. Secondly, the question of how the field is to be conceived. This means, in addition, that a rethinking of the field opens up how the possibilities that inhere in the object/field relation are to be worked out. In each instance what is presupposed is the primacy of the relation – object/field. This means that the primacy of the object has ceded its place to the primacy of the relation.

While the move to the primacy of the relation is the position that has to be explicated, the term ‘field’ blurs distinctions. It can be easily be replaced. Within the philosophical it can be substituted by ‘place’; in more strictly architectural terms by ‘site’. And yet, neither captures the full force of moving from the centrality of the object to the position in which objects are the *after-effects* of a network of relations. From within philosophy ‘place’ names the locus of human being. Aristotle’s insight is that human being is defined, essentially, as *being-in-place*. (Aristotle, *Politics*, 1253a9). The placedness of a human being provides, within and for philosophy, a provisional description of that which is essential for the development of a philosophical anthropology. There is a clear connection between the conception of place as it occurs in Aristotle’s and Arendt’s claim, made in *The Human Condition*, that to be is to appear. The truth of such propositions is not in doubt. What remains unquestioned however is ‘place’ itself. This is the difficulty that has to be addressed in order to return philosophy to architecture.

There have never been just places. Places have always been loci of contestation. (In the Australian context, the Mabo Decision made by the High Court in 1992 and which overturned what had been the legal doctrine of *terra nullis*



confirms this claim.) Contestation marks the ground; marks may be effaced or recalled – they can be inscribed within processes of design or refused absolutely. The ineliminability of contestation allows lines to be drawn between colonisation, the clearing of areas of the inner city to facilitate gentrification and the expansion of suburbs in ways that ignore environmental considerations by naturalising the demands made by the logic of capital. In fact, ‘place’ as a term while naming the locus of contested and contestable processes of territorialisation – which is the inscription of place within relations of power – runs the risk of becoming an unproductive abstraction. For this precise reason it is better to argue that human being as *being-in-place* is positioned and repositioned within and by processes of territorialisation. The body is not just subject to a series of biopolitical constraints it is equally subject to bioterritorial ones.

While this description allows for a rethinking of place in terms of territory within the philosophical it does not provide an automatic point of entry into the architectural. The term that needs to figure is ‘site’. What, however, is meant by site? Literally site refers to a ground plane as conceived by a set of legal determinations. Equally, both context and the environment are necessary to site. While all these elements pertain such a conception of site equates it with the legally determined ground. Site is then no more than the literal ground. This is far from sufficient. What has to occur is the incorporation into any thinking of site is the move from the givenness of the object to the affirmation of the primacy of relationality. And yet, what is at work within such a move? The first part of any answer depends upon the recognition that the reconfiguration of place as territory is one where relationality and contestability play a fundamental role. The second element is the presence of architecture. Neither architecture as building, nor architecture as the history of built form. Rather, architecture as a practice and activity; thus architecture as a locus of design. If there is another definition of site, one that breaks with any possible reduction of site to its literal presence, then it necessitates the transformation of the literal into a locus of design. Integral to this process is both the move from place to territory, and the one from the centrality of the static object to the always potentially dynamic quality of relationality.

### ARCHITECTURAL RESPONSIBILITY

The second element opening up a way of returning philosophy to architecture is located in the demands made by the climate crisis. For philosophy, two ways in which the impact of this crisis figures are the following. Firstly, there is the need to rethink what is at stake in understanding the earth as the locus of human dwelling. The second is the need to rethink concepts such as ‘responsibility’ in order that they are no longer defined by short term or pragmatic considerations. If there is a way of rethinking responsibility, then the latter has to be thought in terms of the temporality of the intergenerational. The question of acting responsibly is not foreign to architecture. And yet, it is invariably positioned in terms of an almost unavoidable ‘presentism’ that makes any thinking of and for the future impossible. A number of philosophers have drawn on the work of Jacques Derrida to overcome this limitation. In *Specters of Marx*, and elsewhere, Derrida evokes

the possibility of justice for ‘those who are not there’. A responsibility for the dead as well as, and equally, for those who are yet to be born. Justice and responsibility refer both backward and forward. For Derrida both justice and responsibility are positioned by the ‘future’ (*l’avenir*) as that which is ‘to come’ (*à venir*). The intergenerational defines time. The object of responsibility – and here that object is the Earth – and those for whom or in relation to whom responsible actions are undertaken have to be thought in terms of this temporality. While such a set up does not determine activity in any direct singular sense, it does provide that in terms of which judgement is actually possible.

What then of architecture? What matters here is the recognition of certain questions, rather than others, as having insistence. The question of responsibility in architecture has to be reconfigured in terms of architecture’s relation to both intergenerational responsibility and intergenerational justice. Arguments for sustainability only have any force if the more urgent questions of what is being sustained, and for whom, are addressed. Answering them refers as much to the earth as the locus of human dwelling as it does territory as naming sites of contestation. For example, the current burning of the Amazon rainforests necessitates that the Amazon be rethought as a territory in the precise sense that its destruction cannot be prevented as a result of the exercise of either national sovereignty or national law but only by the possible application of international law and thus the development of another sense of sovereignty.

As is clear from the example of the Amazon to identify the presence of contestability is not to identify an open and neutral field on which contestation unfolds. Contestability works within a setting in which dominant logics prevail. Networks of relations that work at an urban scale become the reiteration of these logics. If it can be argued that this reiteration sustains that which allows for the climate crisis to continue, then it can be conjectured that architectural responsibility is connected to possible design activities whose project is forestalling the reiteration of these logics or at the very least minimising their destructive force. Once the primacy of relationality can be maintained, and in which relationality is understood as sustaining both relations of power with their own organisational logics, then design takes on another possibility. It holds open the possibility of *autonomy-within-relationality*. The full development this position would draw as much from philosophical writings on autonomy, thus conceived, as it would begin with the urban projects of Oswald Matthias Ungers, specifically the *Berlin as Green Archipelago* project of 1977.

Relationality involves a repositioning of the architectural. It describes the given, however it does so in ways that open up on the level of design the possibility of an interruption of the logics that sustains the given. Working beyond the object and with the primacy of relationality – within a setting that assumes the ineliminable presence of the climate crisis – allows and demands another staging of the relationship between philosophy and architecture.

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# CHAPTER



Some of the attendees at the President's luncheon at Tusculum last November. Front row L to R: Kathlyn Loseby, Laura Cockburn, Agi Sterling, Kerry London, Francesca Hughes. Middle row L to R: Elizabeth Mossop, Angelina Pillai, Abbie Galvin, Deborah Dearing, Ursa Komac. Back row L to R: Kate Doyle, Julia Cambage, Catherine Townsend. Photo: Kate Concannon

In November last year, NSW Chapter president Kathlyn Loseby joined me in hosting a luncheon at Tusculum with the heads of NSW architectural schools, the then incoming government architect of NSW and the leaders of each of the profession's membership and regulatory bodies. It was something of a historic occasion for women in architecture and city making: the guest list was comprised entirely of women who, for the first time in NSW, hold each key leadership position within these organisations.

The discussion traversed pressing issues around the future of architectural education and of the profession, the clear and present climate emergency, and Indigenous recognition within the built environment.

Across the group emerged the unanimous view that the discourse of architecture's response to environmental crisis – and all the flow-on crises it generates – needs to shift from the relatively unambitious concept of sustainability to the deeper, transformative approach represented by regenerative design. Head of the school of architecture at UTS, Professor Francesca Hughes, noted how architecture students are increasingly drawing connections between climate change and social inequity. Systems

based on growth are not going to deliver the change we need, and Prof Hughes observed that, intuiting this, students aren't merely looking to questions of sustainable construction but of policy and government. Professor Elizabeth Mossop, dean of the UTS school of design, architecture and building, corroborated the view, identifying within this trend a reflection of broader change in the way students are thinking about how they might do and be as architects. They don't simply see themselves joining a 'neoliberal profession' but are forging new visions and ultimately new paths for applying their hard-won skill in design thinking.

But while students' apprehension of the built environment as something more complex than a mere assembly of tangible objects is both laudable and exciting, the need for emerging graduates to connect more practically with the real world of construction and materials was likewise recognised by all at the table. As AACA CEO Kate Doyle remarked, larger university cohorts and the diminished role of architects on site has meant reduced opportunity for graduates to obtain practical skills and coalface experience. The industry is feeling this lack, and older architects who enjoyed these opportunities fear for how it will impact the

*‘Kathlyn Loseby expressed a shared hope that the NSW building commissioner’s current review will drive changes in education and continuing professional development supported by the Institute to help restore profession-wide competency in this area as well as building quality and stakeholder confidence in turn.’*

profession’s value, relevance and status in construction into the future. Kathlyn Loseby expressed a shared hope that the NSW building commissioner’s current review will drive changes in education and continuing professional development supported by the Institute to help restore profession-wide competency in this area as well as building quality and stakeholder confidence in turn.

The matter of relevance and value more broadly is critical to the profession’s future – a future the feature articles in this issue show that many perceive to be one haunted by the spectre of obsolescence. Architects and those who understand their work readily recognise the profession’s value, but how do we identify and communicate that value more broadly? Poorly, it would seem all our guests agree. Prof Mossop probed at the reason for this, asking why it is that our incredibly synthetic, transformative discipline has failed to communicate to the general community the benefits it brings. How are we to gain traction in public discourse around our ability to contribute uniquely and effectively to advance social transformation and climate resilience, for example, when we cannot seem to articulate what benefit our work confers?

By way of example, Dr Deborah Dearing pointed to the tremendous potential that architecture has to change the communication, culture and ethos of the organisation it houses, but this kind of value is never discussed. Reflecting on her experience living and working abroad, particularly in Scandinavia, Dr Dearing noted the striking cultural challenges here in Australia for recognising the value of architecture. She invoked the familiar fact that in Denmark architecture is not seen as expensive or a luxury but rather as the means to achieving cost-effective design solutions for better performance, but she observed that there are also challenges within the local culture of the profession itself. As now Government Architect NSW Abbie Galvin remarked, architecture is an incredibly holistic discipline. We expect architects to do everything – project management, construction documentation, high level design and more. But among our own we don’t tend to consider someone a ‘real’ architect unless they are actively and obviously engaged in ‘design’. Yet design thinking is so much more than that view would seem to appreciate.

ACA CEO Angelina Pillai spoke of the need for a concerted, professional branding exercise to define and communicate the value of architecture to non-architectural players within industry.

- ATTENDEES OF THE NSW CHAPTER PRESIDENT’S LUNCHEON,  
21 NOVEMBER 2019
- Julia Cambage, CEO, Australian Institute of Architects  
Kathlyn Loseby, NSW Chapter President, Australian Institute of Architects  
Laura Cockburn, NSW Vice President, Australian Institute of Architects  
Kate Concannon, NSW State Manager, Australian Institute of Architects  
Abbie Galvin, Government Architect NSW  
Dr Deborah Dearing, President, NSW Architects Registration Board  
Kate Doyle, CEO, Architects Accreditation Council of Australia  
Catherine Townsend, President, Architects Accreditation Council of Australia  
Angelina Pillai, CEO, Association of Consulting Architects  
Agi Sterling, NSW/ACT President, Association of Consulting Architects  
Professor Kerry London, Dean of School of Built Environment, Western Sydney University  
Dr Ursa Komac, Director of Academic Program in Architecture, Western Sydney University  
Professor Elizabeth Mossop, Dean of School of Design, Architecture and Building, UTS  
Professor Francesca Hughes, Head of School of Architecture, UTS

AACA president Catherine Townsend agreed that a new narrative medium needs to be cultivated as drawings and images – the stock in trade and comfort zone of architectural communications – don’t adequately describe our value: ‘It’s like trotting out super-models and saying “we’re actually smart as well”’, she quipped.

Led by Kathlyn Loseby, the Institute’s extensive and intensive campaign to advocate for the profession at this critical time of construction industry reform is a shining example of how our organisations are in fact capable of drawing together a narrative and communication strategy for ensuring this value is understood beyond the echo chamber of the profession, and for real and far-reaching benefit. This benefit is for architects, sure, but also and crucially for the broader community.

The group was also unified in the view that the profession needs to develop Indigenous cultural literacy in order to deliver more sensitive design responses that engage with Country. Alongside this (re)education of architects, the imperative to take action to promote participation by Indigenous individuals in design professions and by Indigenous communities in design projects is keenly felt. Initiatives such as the use of Indigenous naming and signage, scholarship and career development programs, and the formation of active groups such as the Institute’s First Nations Advisory Group are all recognised as contributing positively to promoting beneficial outcomes for the built environment and for all community members, especially Indigenous people. But there is more to be done here, individually and collectively, personally and professionally. And as Institute CEO Julia Cambage asserted, heeding the stewardship of Indigenous leaders will of course be fundamental to effective action and authentic recognition.

While the challenges facing the profession are manifold (and in some respects all too stressfully acute), a *modus operandi* of open and collaborative engagement characterises our current academic, government and professional leadership. Unquestionably our work is cut out for us, but the present bears all the strength of genuine, capable alliance. And from here the future looks crazy busy but really rather bright.

Kate Concannon is the state manager of the NSW Chapter.

# Progressing the 2020 advocacy agenda

As we start a new year the Institute continues to focus on influencing the policy outcomes for the Design and Practitioners Bill 2019. With the NSW Upper House scheduled to resume debate on the Bill in late February, the Institute is continuing to promote our recommendations: to deliver better equity of obligation and accountability more broadly across the industry, a nationwide requirement for the registration of all building practitioners and more robust and trusted certification processes.

In summary, the bill will impact registered designers, registered principal designers and registered builders. It aims to provide greater transparency of compliance certification to consumers, in addition to more rigour around duty of care and warranties for purchasers.

On 21 January 2020, the NSW government announced further building and construction reforms, including a new ratings scheme for building and the announcement of the six reform pillars working streams. The panels of experts will cover: legislation and regulation changes, ratings systems, improving industry skills, ensuring contracts help meet standards, digitising the industry and promotion of modern construction methods via research and project cases. The Institute will be represented on each of these pillars, advocating and informing on the role of architects within the construction process.

In response to the announcement NSW Chapter president Kathlyn Loseby said:

‘the new six pillars will boost the powers of the construction regulator and are a much-needed and appropriate response. The Institute has been calling for improved building safety regulations for years. We support the NSW government action on this and now we need a national scheme that helps to protect all consumers around the country. Safety has always been our top priority. Better documentation is critical to improving safety, transparency and, most importantly, accountability. We fully endorse this move and appreciate the NSW government’s willingness to take on board our ideas for a better regulated building industry.’

Wilma Walsh is the NSW Chapter’s communication officer.



## La Perouse Museum renewal

TKD Architects have been appointed for the renewal of the La Perouse Museum [pictured above]. The project, including a masterplan of the inner loop of the La Perouse Headland for Randwick City Council, is in early stages of community consultation and concept design.



## Luis Gomez at AJ+C

Allen Jack+Cottier is pleased to announce that Luis Gomez [pictured above] has been promoted to the position of associate. Luis has shown how commitment to understanding our clients’ needs ensures we can meet their objectives. He consistently strives for excellence in his design work and has demonstrated his abilities in concept design. Luis has joined the Abbotsleigh School team in a key role for their senior school STEAM Building. He has previously worked in Europe on projects including the San Mames Stadium in Bilbao and the Constantine Theatre in Algeria.





# Western Sydney Parklands: Duncan Corrigan on the new model of city making

Interview by Peter Salhani

*‘Greater Sydney has a larger land area than the entire country of Lebanon, and the LGAs of the Western Parklands City occupy 65% of that. Good urbanism today means compact, walkable places with strong local identities.’*

What does the future of Western Sydney look like to you?  
Dozens of towns and cities each with their own character, united under the loose umbrella of ‘Greater Western Sydney’.

What are the key challenges facing Western Sydney?  
Size and climate. Greater Sydney has a larger land area than the entire country of Lebanon, and the LGAs of the Western Parklands City occupy 65% of that. Good urbanism today means compact, walkable places with strong local identities. It’s hard to keep that focus when you’re talking about such vast areas.  
Climate is the other major challenge. Outside of the mountains, Western Sydney averages much higher temperatures than the rest of Sydney and has more of the temperature spikes that create emergencies. The expansion of the district’s urban footprint will contribute to ongoing increases in both.

How do urban designers build ‘brand’ or identity in new places?  
Traditional cities and neighbourhoods were established over many generations. It is not reasonable to expect to shortcut this process without significant thought and investment.  
One local project in which we’re currently working with the issue is the pilot Community Facilities Hub project within the Western Sydney Parklands [illustration above by Ian Hollen]. This will be a place where education, health, sports and other community facilities will be provided upfront; intended to serve the future residents of the new neighbourhoods next door. This puts the social supports of a community on an equal footing with all the other facilitating infrastructure we provide to greenfield sites.  
We’ve been designing the Hub to be more urban than the natural environment of the rest of the Parklands, but not so much that it feels like a typical local centre. This is meant to encourage the new greenfield communities to piggyback the established identity of the Parklands, which are the namesake of the whole district after all.

How can designers grapple with the issues of climate?  
Increasing the urban area across Western Sydney inevitably means replacing a lot of green with a lot of grey. However, with good design it is possible to at least mitigate the damage. In our current neighbourhood-scale projects in Western Sydney we’re designing the street networks, as well as the streets themselves, to minimise the amount of road reserve, while advocating for recycled, reflective surfacing and continuous tree canopy coverage. Roofs are becoming contested space – balancing usable green space, reflectivity, emissivity, solar power generation and water collection.  
Western Sydney Airport is the perfect place for the government to show similar leadership, demonstrating what they consider best practice across its hectares of roof and runway.

Duncan Corrigan is the director of urban design at AJ+C.



# Research and design – whole of life architecture

NBRS research has been addressing the whole of life question as it impacts our design and delivery methods. Many architectural projects only address the urgency of a deadline and the immediacy of a brief. It has become routine to give little consideration to a design that may morph into a future use or indeed consideration into end of use. Are the planning patterns, materiality, structural systems too unique and not transferrable? It is counterintuitive to bring to the design stage the drivers of building life cycle, the repurposing of a shell and the end of life strategies. Our core values are supported by sourcing projects that will have an impact and add to the fabric of society.

NBRS is elevating the idea of the circular economy in order to bring better social and sustainable outcomes. Design technologies need to be more responsive and more evolutionary. The platforms need to allow designs that flex around building-use changes over a lifetime. The speed of change is becoming more confounding and our design technologies need to permit flexibility of purpose and use.

In a construction industry where generally we are laggards when it comes to investment into R&D, NBRS desires to change the paradigm by putting a greater focus into research and design (our version of R&D). Our research projects look closely at people focused outcomes. It is driven by a core value of creating designs that will lead to a beneficial social impact.

The wellbeing of a community is supported by the wellbeing of the individual. The rise of remote social connections has led to a rise of loneliness and isolation. Our desire is to use our research and design technologies to ensure the creation of spaces that bring people together, not alienate them. The tools of design technologies are employed with methods of distant working collaboration but always our efforts are underpinned by a core of creating a socially responsive outcome.

Recently our research and design team have considered ways to socially rehabilitate cyber criminals. We use international competitions to sharpen our design technologies and sharpen design dialogue in consideration of pressing socio-architecture problems. Our solution for a cyber-criminal detention centre in The Hague is a reinvention of what incarceration may look like. It is a permeable village campus where architecture creates a platform for social re-engagement. Offenders discover wellbeing through interdependency of shared living and participating in socially minded projects. As a village centred around an education precinct the environment supports retail, recreation and spiritual building blocks. The idea is called *communiversity* – all on an adaptable configuration making repurposing a reality. The design was awarded runner-up in the Switching Prisons competition. The challenges of life, living together and the architectural response remains the key focus of our research and design.

Andrew Duffin is the director of design at NBRS Architecture.



NBRS Architecture was awarded runner-up in an international design competition for a cyber-criminal facility in The Hague, Netherlands. The Communiversity scheme aimed to create a platform whereby those caught in criminal activity within the cyber world could discover the humane benefit of community-centred living and skill building.

Image: NBRS Architecture

# The future of BIM: getting the most value out of model management

Construction is a complex and multifaceted undertaking, requiring input from many different stakeholders, such as designers, engineers and planners through to project administrators, contractors and subcontractors. In such a system, the slightest problem in the process can cause bigger challenges down the line – in this case pushing projects over schedule, blowing out budgets and compromising quality and safety. That is why engineering and construction professionals need to rely on methodologies such as building information modelling (BIM) working within a common data environment (CDE) to bring greater control and efficiency to the project.

At its heart, BIM working within a true CDE – one with neutrality and security at its core – should enable collaboration; it is the foundation for the next phase of digital transformation in our industry. It should operate through a common set of standards and values bringing together different project teams and allow them to work together in the same way through shared technology and processes.

However, a challenge for the BIM methodology that must be overcome is that it is often incorrectly regarded as being just for design teams. This continues to impact adoption across wider project teams.

## MODEL MANAGEMENT AND THE CHALLENGE WITH COMPLEXITY

Although the importance of open and transparent collaboration has become a well-known and addressed topic in construction – certainly over the last two decades – the model management process in BIM projects has tended to be overly complex. This is due, in part, to often being limited to specialists who use proprietary modelling tools and come in only during certain phases of the project. This can prevent the systematic participation of other parties (such as the client or funder/bank) because project information is not captured in a single place and therefore is not transparent or complete.

The use of multiple proprietary tools without one central base creates inefficiencies and problems. Especially in the model management process, it can be challenging to keep the data together and provide an accurate view of the full process. So, for example, issues and clash detection out of federated models are shared as PDFs or Excel documents, partly from one platform into another platform. In practice, issues and clashes are instead administrated then managed. At least the main potential for the project cannot be addressed properly. This results in more errors, rework, and quality issues that can impact the entire project.

The industry needs a solution, a process that flows better through a single platform capturing all the relevant data and information in one place and encouraging a more collaborative approach for all teams involved on a project.

## THE MOVE TO MODEL COORDINATION

Model coordination based on a true CDE is the next generation of model management. It is a cloud-based approach that enables all team members to access the same central platform. It allows for seamless integration with common authoring and model checking tools, reducing the need for numerous applications in favour of project-wide BIM participation. What's more, because the process operates through a single platform, it enables all relevant information and data to flow into the CDE, helping to build a high-quality digital twin – a true picture of the entire project.

A cloud-based approach to model coordination and the entire BIM process, all within a true neutral and highly secure CDE, provides projects with an unprecedented level of efficiency, precision and foresight to the entire construction process. It also helps to reduce problems caused by duplication or versioning.

Using shared models helps different teams optimise the processes they are responsible for. Team members can track the progress of the build more closely, while responsibility clearly stays with the owner of the model. All of this can lead to full transparency over the entire lifecycle, from materials tracking and management, through to safety monitoring and design reviews. Approvals are easier to obtain at every stage as team members can access the most up-to-date project information.

## THE FUTURE OF BIM

Through the further evolution of BIM standards and greater adoption of true CDEs, all stakeholders involved in the construction cycle will be able to take a step back and see the big picture. In fact, things become easier. Better access and visualisation of possible scenarios can create more transparency and trust during a building's construction.

Under such an approach, all parties are working from a sole source of truth for project information, so project teams can easily plan the most efficient workflow and identify issues and clashes during early planning stages.

The future of BIM – and the digital transformation of the industry – lies in greater openness and the use of true CDEs. Only then can we achieve higher levels of integration across applications and technologies. This allows teams to work with the best tools for their job and redefines how teams work.

Robust collaboration bridges the gap between the design team, construction workers and building owners, ensuring all parties involved are reading from the same blueprint from the minute the project starts to its close. New technologies like virtual reality and other applications within the process can offer even greater visibility and increase work quality. Taken together, these developments can and will profoundly improve how assets are designed, built and operated, with model data at the centre.

Frank Weiss is senior director of new products, BIM and innovation at Oracle Construction and Engineering.





Speaker discussion at Dissent, the 2019 Australasian Student Architecture Congress in Christchurch, New Zealand (left), and Peggy Deamer's presentation (right)

# Dissent 2019

Dissent 2019 was the 25th iteration of the Australasian Student Architecture Congress (ASAC) and took place in Ōtautahi, Christchurch over the first five days of October 2019. The gathering of 75 delegates and 21 speakers resonated a defiant spirit of optimism that things must and will change in how architects can challenge the status quo and approach to some of the world's larger looming issues.

The dissent theme was political by nature and firmly validated the importance of this independent and student-led and organised activist event. Conversations and presentations echoed the idea that architecture can and must do better and beyond this; the congress attendees collectively generated practical strategies and methods for doing so. This gathering was not only radically inspiring, it was exceptionally productive.

Dissent was done on a budget – returning to its original format of open conversational discussions, workshops and lectures. From the committee's chosen leadership approach to the format of each event, this congress flattened hierarchies and walked the talk on new ways of practicing, organising and doing. The volunteer organisational committee included 15 students and recent graduates from Wellington and Auckland and was led by two unwavering creative directors Elise Proby-Cautley and Riley Adams-Winch. Together, they created a unit, fuelled with unfathomable passion and commitment to pull this congress off. The team hustled to curate, contact and connect speakers from around the world into a format that thrived from its diversity.

Keynote topics included: the work of the Architecture Lobby and the agency and rights of the architect as worker (Peggy Deamer, Keefer Dunn), representation and queerness within academia and practice (Adam Nathaniel Furman) and new aspiring models of working (Jack Self). Dr Emina Petrović expressed the importance of student political activism; Rau Hoskins and Dr Becky Kiddle discussed decolonisation and methods for engaging with mana whenua; Justine Clark and Dr Gill Matthewson shared the work of Parlour on equity in architecture; Elisapeta Heta poetically shared her experience as wāhine toa in the discipline; and, alongside Dr Ryan Reynolds (Gap Filler) and Jess Haliday (Te Pūtahi), many local contributors helped site all this in Christchurch – a city that resonates an indescribable hope.

Given the nature of the congress, it didn't take long for discussions to channel into the issues that arise through architectural education. Fixations on employability, lacking diversity and representation through curriculum and pedagogy, along with studio culture that fuels unsustainable work habits and all-nighter mentality are all key concerns that students were quick to seek solutions for. Dissent gave attendees the space to connect, share problems and solutions, and make commitments for change when returning home.

Furman spoke of the congress spirit: 'The energy, resourcefulness and positivity of a student-led event stuck to a razor-sharp focus on the issues it raised and with practical takeaway strategies for students and all attendees to [...] go into the world as ultra-proactive activists and positive dissenters, agitating for change in an otherwise sclerotic architectural culture.' Conversations among attendees urged for this 'razor-sharp' focus to translate into actionable change in each person's workplace, studio or community.

Keefer Dunn spoke of the opportunities from congress: 'At a student-run conference, there are no pretensions or academic clout chasing – just a clear focus and reflection on how we, as architects, can work to make the world a better place. With climate change, inequality and other issues looming large, this generation knows that they have no choice but to dissent and fight back.'

Dissent was another chapter in a history of student congresses, but the attendees and organising team behind Dissent intend for its ideas and conversations to be ongoing. Intentions and ambitions of this magnitude must be constantly in self-learning mode – critically reflecting, iterating and adapting. Stay tuned. The next chapter of the congress will take the theme of 'Occupy 2020' and will be hosted in Brisbane later this year.

**Ekta Nathu** is a currently completing her Master of Architecture at Victoria University of Wellington. She was a finalist in the 2019 NZIA Resene Student Design Awards and spoke in Melbourne at the 'Transformations: Action on Equity' 2019 symposium organised by Parlour.



# Broadening the scope of city making with ethics and openness

*Building and Dwelling: Ethics for the City* by Richard Sennett  
First American edition (Farrar, Straus and Giroux, 2018)  
Penguin Press, 2019

Richard Sennett’s *Building and Dwelling* is an important book arguing for an ‘ethical’ city, open to the experience of dwelling. ‘Ideal’ city proposals since Vitruvius have ranged from aesthetic ideals to the practicalities of health. Le Corbusier’s Radiant City sits firmly in this tradition, complete with sketches of Modular Man boxing in his light-filled apartment in the air. Sennett departs from such traditional ideals, in particular the Modernist city.

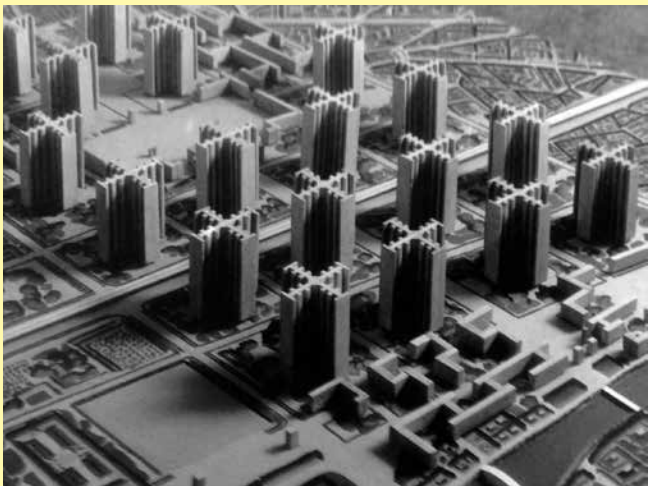
Sennett examines the relationship between how we build and dwell in the contemporary city, arguing that an ‘ethical’ city, open to all, cannot exist where building and dwelling are divorced. Sennett elaborates on this distinction; the first a physical place, the second the experienced city. The French used the words *ville* and *cite* to distinguish the two. Initially *ville* referred to the whole city and *cite* a particular place. By the 16th century, *cite* referred to the character and life of a place; built incrementally, adapted over time by those that dwelt there.

Sennett examines the disconnect between the cities we build and the places where we dwell. For him this rupture is at the heart of today’s metropolitan cities, where we no longer build cities for dwelling but instead ‘immodest’ cities closed to the more complex experience of dwelling.

For Sennett the ‘dwelt in’ city is best described by turn-of-century authors like Proust whose characters’ detailed descriptions of their experience of places in which they dwelt create a collective city picture. It’s no coincidence that Proust, translator of Ruskin’s *The Seven Lamps of Architecture*, was able to describe architecture as experience to life so memorably, one where *ville* and *cite* co-existed.

Sennett is critical of the 19th-century *urbanistes*, the ‘great generation’ of Cerda, Haussmann and Olmstead whose efforts to shape the *ville* – linking it to the *cite* of humanity and sociability failed, exacerbating the split. Cerda’s Barcelona grid conceived as a *cite* of equality created a monoculture *ville* of additive blocks; Haussmann’s accessible city of grand boulevards put space above place with mobility at its heart. Even Olmstead’s Central Park, a social place of nature accessible to all, in Sennett’s view fails as *cite*, a place of privilege for those who can afford to live around the park. Not all will agree with this view.

By the 1930s this split was well on the way to divorce, exemplified by the Plan Voisin of 1929. Le Corbusier’s own words tell the story: ‘the street wears us out and when all is said and done we have to admit it disgusts us’. The Charter of Athens – drafted by CIAM on a boat in the Mediterranean – would also ‘design’ the universally applicable ideal city.



Le Corbusier's unrealised project for Paris, Plan Voisin (1929) Photo: SiefkinDR

Critics including Mumford and Jacobs objected to the Modernists’ ‘folly of creating a physical structure at the price of destroying the intimate physical structure of a community’s life’. The two disagreed with respect to *cite* and *ville*. Jacobs advocated an anarchic, bottom-up small-scale form emerging gradually from how people dwell. Mumford believed that design must order the city. For Mumford, localism was unable to scale up to the realities of growing cities.

So, what is Sennett’s solution? When he confronted Jacobs with the question of choosing between Jacobs’ or Mumford’s vision, Jacobs retorted, ‘Which would you do?!’ Sennett attempts to bring both together, proposing five forms that allow the *cite* to become complex and *ville* accommodating of *cite*:

1. *Synchronous forms* – public places that accommodate many things at once – synchronous not sequential
2. *Punctuated forms* – diverse urban elements; ‘exclamation marks, semi-colons, quote marks’
3. *Porous forms* – membrane like places with permeable borders privileged over fixed boundaries
4. *Incomplete forms* – flexible ‘shells’ and ‘type’ forms rather than narrow, functional ones
5. *Multiple forms* – seeing the whole city but not top-down; minimum specification of form.

Sennett illustrates his vision for an ‘open’ and ‘ethical’ city by examining two projects. The first is the Googleplex in the West Village, an internally focussed campus with a controlled boundary. The amenities of the city are self-contained. It is in the city and not of or open to the city. Sennett contrasts this with Battery Park conceived as an extension of the Manhattan grid inspired by Jacobs. The plan is ‘open’ to the public domain, accommodating a variety of activities. While porous to a degree it is still severed from Manhattan by the freeway.

While Sennett’s critique offers no silver bullet, it asks us to think beyond the relatively superficial placemaking slogans largely appropriated by project marketing, bringing the physicality of city making back to a more profound question of ethics and openness. If we want both Jacobs’ and Mumford’s vision of the city, what structures do we need to challenge? One suspects that may include challenging broader economic and governance drivers that narrow the scope of city making.

Philip Graus is an architect and urban planner. He is also an adjunct professor at UTS.



## Our changing climate

In 2019, the Oxford English Dictionary deemed the phrase 'climate emergency' to be the word of the year. This linguistic transition – from mere change to catastrophe – reflects the destruction inflicted on our planet. This is unsurprising, given the devastation that's scarred the last decade: the predicted extinctions, the burning of the Amazon and the fading out of our Great Barrier Reef.

Of course, 2019 also saw a groundswell of recognition that the climate emergency exists and we need to do something about it. In Australia, more than 700 studios signed the Architects Declare pledge, making a commitment to more sustainable practices. And last September 350 000 citizens took part in student-led climate strikes, forming the largest display of public protest since the Iraq War. Architects Declare is undoubtedly a significant social movement and one I wholeheartedly support. Ultimately, however, it's meaningless without deep and lasting action – without the deliberate pursuit of change.

There is, of course, a perilous gap between reaction and action: while it's easy to summon disdain, it's difficult to change our behaviour. As Jia Tolentino writes: 'Our world – digitally mediated, utterly consumed by capitalism – makes communication about morality very easy but makes actual moral living very hard.'

With email chains and [change.org](https://change.org), it's all too easy to add our names to a chorus of dissent. It's easy to read opinion pieces and lament our nation's leadership. It's easy to blame others for their inaction, while quietly avoiding the complex quagmire of changing our status quo. So while Architects Declare has the potential to change our climate – and create a culture of change – we ultimately have a choice: to continue to pursue what is safe and familiar, or to alter our course.

Last year, we saw a number of events – alongside Architects Declare – that may change the trajectory of our profession. Famous architects like Junyai Ishigami were rightfully called out for their culture of unpaid internships. In the UK, a social housing project won the Stirling Prize and the first grassroots architectural trade union, UVW-SAW, took hold. Closer to home, we held conferences that openly acknowledged our fraught relationships with country and indigeneity. Our conversations are shifting, slowly but assuredly, towards equity and fairness. While our physical environment is irreparably damaged, our cultural landscape can change.

I am tremendously excited by the prospect of a profession that embraces this climate crisis. At our core, architects are problem solvers. We are creative and clever; we thrive on constraint.

*'We have the tools – of imagination and rhetoric – to propose alternatives. If we so choose, we can produce buildings that are carbon neutral or positive, that are flexible and progressive. Building can be a conscious and moral act, if we let it.'*

We have the tools – of imagination and rhetoric – to propose alternatives. If we so choose, we can produce buildings that are carbon neutral or positive, that are flexible and progressive. Wittgenstein once wrote that 'ethics and aesthetics are one'. As architects, we can advocate though active practice. Building can be a conscious and moral act, if we let it.

I'm writing this over the summer holidays, as I take shelter inside. The sky outside is smudged by smoke and our state is alight: at present, 4.2 million hectares and almost 1500 homes have burned.

I've always loved New Year's: as a relentless optimist, I adore the act of making resolutions. It gives focus and shape to the year to come. In 2019, we declared a climate emergency. We started important conversations with our clients and teams. We painted placards and took to social media and showed up at marches en masse. Many of us signed Architects Declare. Now, we need to act. I don't know what this year, or this decade, will look like. I don't know how many more hectares of habitat will be destroyed in these coming weeks. What I do know, however, is that this devastating start to 2020 has given me the courage to change. After all, as our climate changes, we must change too.

Jennifer McMaster is the founder and principal of Trias.





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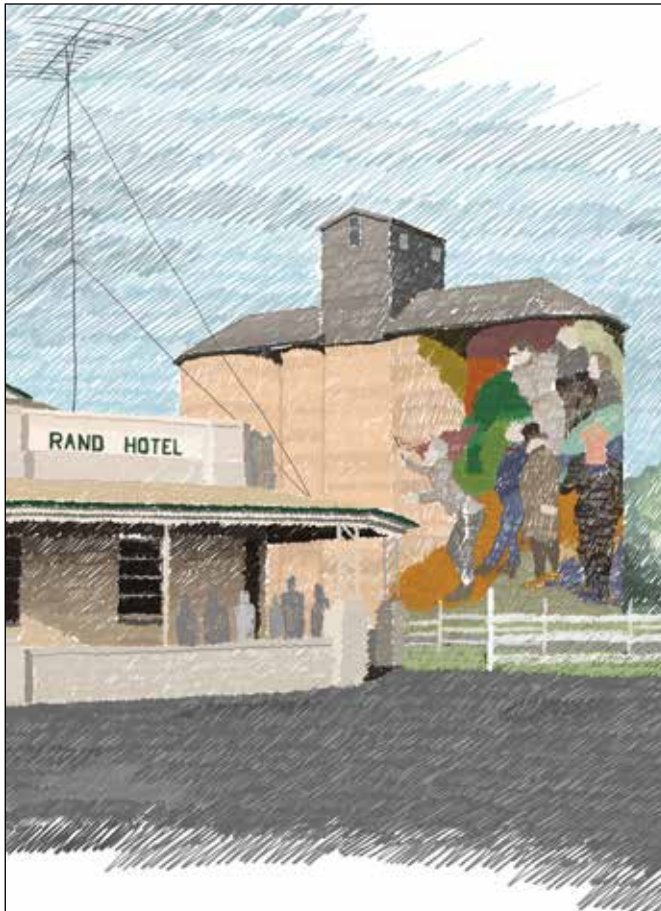
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The NSW Regional Showcase series of one-day CPD events brings together regional architects to learn and network, and provides the opportunity for you to engage directly with key regulatory bodies, suppliers, local council, tradespeople, and community members. Travelling to locations across NSW throughout the year, in 2020 our first stop is Bathurst.

MORE INFO  
[architecture.com.au/nsw](http://architecture.com.au/nsw)  
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FEATURE

- Creativity and the rise of artificial intelligence**  
Gregor Strachotta 2
- Futures: going by the book**  
Sue Wittenoom 4
- Human-centred design for rejuvenating the environment**  
Adam Hannouch 6
- Sustainability to sustain humanity**  
Maryam Houda 7
- Harnessing big data to make cities**  
Michelle Cramer 9
- Whose future? On the politics of building smart cities**  
Jathan Sadowski 10
- A conversation with the building commissioner David Chandler**  
David Welsh 12
- Alternative Housing Ideas Challenge**  
Stephen Varady 14
- Wikitecture by the open source architect**  
HY William Chan 16

- Do we need workplace designers in the future?**  
Jamileh Jahangiri 18
- Cohesive approaches to disruption in architectural practice**  
Gavin Crump 22
- Regaining control**  
Ben Berwick 24
- Mutations/Creations: documenting the history of the future at the Centre Pompidou**  
Melika Aljukic 26
- Heritage: from technophobia to technophilia?**  
Hugo Chan 28
- The great debate: Will artificial intelligence and robotics fundamentally re-shape the construction industry?**  
Review by Sarah Lawlor 30
- Interactions of the future**  
Sarah Gilder 32
- The second turn of non-standard architecture**  
Melika Aljukic 33
- From object to site: returning philosophy to architecture**  
Andrew Benjamin 37

CHAPTER

- Message from the NSW state manager**  
Kate Concannon 39
- Progressing the 2020 advocacy agenda**  
Wilma Walsh 41
- Patrons' news** 41
- Western Sydney Parklands: Duncan Corrigan on the new model of city making**  
Interview by Peter Salhani 42
- Research and design – whole of life architecture**  
Andrew Duffin 43
- The future of BIM: getting the most value out of model management**  
Frank Weiss 44
- Congress review: Dissent 2019**  
Ekta Nathu 45
- Book review: Richard Sennett's *Building and Dwelling: Ethics for the City***  
Philip Graus 46
- Provoke: Our changing climate**  
Jennifer McMaster 47