Digital dialogues
Informing and impacting education, research and practice
Greater Sydney Commission

When the NSW Minister for Planning Pru Goward attended this year’s NSW Architecture Awards ceremony I reminded her that, with population growth and increased density there must be a corresponding improvement in the quality of the city. The challenge is to ensure the city becomes better as it becomes bigger.

The decision to establish a Greater Sydney Commission that will provide a whole-of-government framework for the future planning and development of the Sydney region is something the Institute has been advocating for many years. I met with the minister in July with Institute colleagues Philip Graus and Paul Walter, Chair of the Built Environment Committee. We had a lively discussion about the ways other cities had gone about planning their growth in a regional framework without losing sight of quality, and she showed a keen interest in what we had to say. Subsequently we sent her a 20-page submission summarising the Institute’s views on strategic planning and urban design, including case studies of four planning regimes: Western Australia; Melbourne, Chicago, US; and Vancouver, Canada. We anticipate taking the conversation further with the Minister as the role and function of the commission is defined.

SEPP 66 Review

My predecessor in the President’s role, Matthew Pullinger, attended a forum in December 2012 in which the findings of the NSW Department of Planning’s review of SEPP 66 were presented. Now, many months later, it’s good to have the official release of the new SEPP. All the key positive elements have been retained and modifications are mostly in line with the Institute’s recommendations. The key change is that the Residential Flat Design Code will now be a guideline, rather than a set of instructions. Some council planners were using the code metrics like a checklist, whereas they were only ever intended as quantified illustrations of the SEPP’s design principles.

The digital age

This issue of Architecture Bulletin righlly explores the ways in which digital technology impacts on the profession, particularly on architectural education. I share with other non-digital natives the need to more actively embrace the possibilities presented by the new era we live in. Apps for architectural walking tours are one thing, but what other design content will the app world give us access to?

Many of you will have attended the ePlanning workshops run by the Department of Planning recently. The advantages of an online planning system should be readily apparent. We should all be willing to seize the opportunities to use digital technology to help us professionally, while also recognising that the humble pencil is still perhaps the most powerful tool of all. Sketching, the agile marriage of hand and eye and imagination, can never be replaced as the most fundamental architectural skill.

Joe Agius
NSW Chapter President

Chapter Manager’s report

It’s that time of year again, the time to celebrate architecture and promote its value to our built environment. This year’s Sydney Architecture Festival will run from 11-30 November and feature a number of exciting talks, films, exhibitions and events, including this year’s Venice Architecture Biennale exhibition Australian Augments, a virtual reality exhibition featuring 33 unbuilt Australian projects. Starting at Sydney’s Customs House you will be able to obtain a map, download the app and walk around Sydney and Parramatta to view the geo-positioned full-scale virtual models.

Architecture On Show talks will be held during the festival at Lane Cove, Mosman, Hornsby, Marrickville, Randwick, North Sydney and Woolahra. For more information about the Sydney Architecture Festival or to download a calendar please go to www.sydneyarchitecturefestival.org.

An event not to be missed at this year’s Sydney Architecture Festival is The Colloquium: Growing a Greater Sydney: Connecting People and Places. Hosted by ABC’s Tony Jones, The Colloquium brings together policymakers, architects, urban designers and government representatives to consider the themes of growing, connecting and improving our city. Speakers will include Lucy Turnbull, Committee for Sydney; Bob Meyer, Cox; Paul Donegan, Grattan Institute; Ross De la Motte, Hassell; Peter Poulet, NSW Government Architect; and Rod Simpson, Simpson-Wilson. It is very pleasing to report that in September NSW News membership grew to 33,349, representing a 9.84 per cent increase on 2013, with member engagement at events held around the state on target to exceed last year’s record total.

Earlier this year the Practice Committee and the Large Practice Forum amalgamated resulting in the development of a number of task groups assigned to investigate several new initiatives for the Chapter. In line with the Institute’s new policy, a task group was formed to address gender equity issues and it was decided early on that rather than talking about equity, a number of actions were required to initiate change within the profession. The actions include a presentation from Dr Elizabeth Broderick, Sex Discrimination Commissioner, which will be held early next year, and the 2015 launch of a new program, Champions of Change, based on the Australian Human Rights Commission model, to accelerate the advancement of women in leadership.

A task group including members of SONA and DARCH was established to review the mentor program. It was agreed that a survey was required to determine what members want from mentoring; the results of which will assist in the development of a new program to be launched early in 2015. Another exciting new initiative next year will be the launch of a new research portal similar to RIBA’s Research and Innovation portal to help develop stronger links between practice and academia and encourage research-based knowledge within practices.

The Built Environment Committee was kept busy throughout the year with responses to State Government on several issues including Rebuilding NSW, Building Certification and Regulation: Serving a New Planning System for NSW, IPART’s Reforming Licensing in NSW, and an invitation for members to participate in the Bays Precinct Summit in late November. A comprehensive report on continuing professional development was prepared by the CPD Committee, and the Education Committee was again instrumental in organising the successful NSW Graduate & Student Awards. The NSW Awards task group is also to be thanked for coordinating what was probably the most collegiate awards night in the Institute’s history. The Design Culture Committee together with program curators prepared an interesting program of Tuesday@Tusculum, Architecture On Show, and other Institute activities for the Sydney Architecture Festival.

NSW Country Division

Winners of the 2014 NSW Country Division Architecture Awards were announced at the October Annual Conference. A full list of winners will feature in the Summer 2015 edition of Architecture Bulletins. Many thanks to the Country Division Jury for 2014, Michael Marshman, Chantal Carr, David Travali, Katharina Hendel and Gillian MacMillan.

Upcoming events include the Wagga Wagga Architecture and Design Festival on Friday 14 November at Catche Store of Food, and Wagga Wagga Architecture On Show, a free event at the same venue from 6pm.

Newcastle Division

We extend a warm welcome to our new Newcastle Chair Debra McKendry-Hunt, from McKendry-Hunt Architects, and our new Regional Events Coordinator Kandis Von Holdt at the regional office in Newcastle. Congratulations to the 2014 Lower Hunter Urban Design Winners announced 5 September at Tempe’s Two Estate. For a full list of winners see www.ithaca.com.au.

Upcoming events include: Newcastle ArchMEET 02, ‘Invisible Architecture: Working with Glass’ on Friday 7 November at Newcastle Museum, Hettyette, Honeysuckle; and the Annual BLASÉ Yacht Race at the Newcastle Yacht Club, Wickham, on Wednesday 19 November, when you can join us for a cruise out through Newcastle harbour. For more information on NSW Country Division and Newcastle events, please visit www.architecture.com.au/events/state-territory/newscountry-division-events-awards.

On behalf of everyone at the Chapter, I would like to thank Chapter Councillors and all the committee members who have worked with throughout the year to create services that are highly valued by the membership in New South Wales. The staff has enjoyed working with you to deliver these services, and looks forward to next year after a well-earned break. I would also like to thank the staff in Newcastle and Sydney for their hard work; they are a pleasure to work with.

Happy Christmas and New Year! 

Roslyn Irons
NSW Chapter Manager
Men: GET it, and GET onboard! Shaun Carter asserts that gender equity cannot be achieved without the male of the species.

I am incredibly fortunate because, as my business has grown, I have found the right employees to support that growth. The senior roles at Carterwilliamson have always been women. Lisa Merkewiström, Fiona Hints, Nicola Collins and Kellie Bantrey have provided a rare combination of skill, temperament and ability. I also work with another business partner Linda Matthews. Linda and I have worked together on a long-term project and it seemed natural to form a partnership with her. Linda won most of the university and state-based awards for a graduating architecture student. For me, it has never been about gender, but ability. I have promoted the person most suitable for the role. I have formed a business with women because they were the right people to form a business with.

I am also fortunate because I have a strong mother who has always made it clear to me that women are the equal of men. I have a strong wife who is a success in a development industry that typically has been dominated by men. I have a daughter who we teach is the equal of the boys in her school.

International institutions were called upon to protect students and graduates from unpaid and underpaid work. In response, SONA will be issuing every student member and non-member with a business card outlining their employment and right to work. Please see your local SONA representative for a copy of this card.

In July, a group of enthusiastic architects and architecture enthusiasts gathered at the blithe showroom in Chippendale for a recap presentation of this year’s Dulux Study Tour. Jenna Rowe, Cheryl Williamson and Michael Zanardo, the New South Wales-based winners of the 2014 tour, presented their observations and reflections from the experience, which took in two of America’s iconic architectural cities: Chicago and New York. Although there were clearly stunning architectural masterpieces and urban spaces included on the tour, perhaps the most interesting reflections came from the interview the group conducted with well-known architectural practitioners. It seemed there was a great diversity in office culture between each firm they visited, and this resulted in different architectural outcomes.

For example, visits to Foster + Partners revealed a top-down management structure based in London, while practices like Family NY take a more contemporary approach, going so far as to fund projects via Kickstarter. Two key observations were noted as common between almost all the practices visited: first, the importance of physical models (both hand-made and machine-assisted); and second, ongoing involvement in education and academia. This was true regardless of practice size, from Strawn Sierralta’s two employees, to Skidmore, Owings and Merrill’s ( SOM) 1,000-plus employees. The Dulux Study Tour was a collaborative initiative between Dulux, the Australian Institute of Architects, and the Emerging Architect and Graduate Network (EmAGN). To read more about the 2014 tour, visit http://wp.architecture.com.au/ duluxstudytourblog/.

Chloe Rayfield
DARCH
SONA

In August I attended the International Union of Architects World Congress – a global gathering of architecture students, academics and professionals – in Durban, South Africa, to contribute to the debate on the state of architectural education. While there have been steady improvements, architectural education seems to face similar challenges on a global scale, including potential deregulation of fees (yes, we are not alone).

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As second semester draws to a close, do not forget that nominations for the BlueScope Glenn Murcutt Student Prize are now open. If you would like to take your involvement with SONA to a new level in 2015, I would also strongly encourage you to nominate to become a local representative. More details on www.sona.com.au.

Good luck for your final presentations!

Peter Nguyen
SONA National President

Gender equity is a fundamental issue the architecture profession is grappling with at the moment. Those firms that are not confronting this issue head-on will lose competitive advantage.

And don’t forget that gender equity is not just about women. Men are just as important as women in this discussion. Many men don’t know or don’t care about their role in the gender equity issue. I imagine there are plenty of men out there who would like to work part-time, but don’t know how they have to ask their boss who is likely to be a man if they can. Or they’re too scared to rock the boat, because the unknown message in the firm is that “contemporary” workplace situations are not tolerated, they’re a known form of career suicide. Just look at what happens to the women who try.

Some men don’t care about gender equity because they want to maintain the status quo. The world is changing though and no longer are care responsibilities the exclusive domain of women. The workforce too must be shared. Addressing gender equity in architectural practice means supporting flexibility, endorsing pay equity and consciously working towards changing a culture of long hours. It’s about supporting employees and recognising non-linear career paths.

Adopting gender equity can only ensure that business is more successful; after all, it retains at 10 per cent of your talent after the age of 35. And that’s an economic issue; who doesn’t want a thriving business that makes more money?

So why aren’t companies doing it already? Some are. Have a look at the most successful practices in New South Wales and you are likely to find they have a better balance of women at all levels of the business hierarchy. They are perceived as doing it well, it’s likely that the culture of those practices doesn’t recognise or promote new and more flexible ways of composing their workforce. By not adopting gender equity, they risk their success, and increasingly, their survival.

It has been recognised that gender equity is not easily accepted in organisations dominated by men. The Australian Human Rights Commission’s Sex Discrimination Commissioner, Elizabeth Broderick has long understood this, and has designed and started a program called Male Champions of Change.

It is an important initiative. It began with 10 men, CEO’s of ASX 500 companies, determined to use their influence to accomplish change by making positive gender equity actions within their workplace and field of endeavour. Over time they become Champions of Change to be held up in the broader work environment. To show other men that it is possible to make a difference through active commitment and a willingness to get involved.

Gender equity cannot be achieved without men. Encourage all men in our profession to GET involved. Architecture will be better for it.
Architect and academic Nicole Gardner examines the issue of digital culture in architecture, looking at the ways digital technologies, techniques and practices influence architectural education and the profession, and offers a vision of the future in which digital tools play diverse roles in the creation of new and different forms of learning and working.

Recently, I found myself at the University of Technology, Sydney (UTS) Library at Ultimo, Sydney across a range of projects including multi-unit residential, and major public transport projects. She has lectured in architecture and design at the University of Adelaide, the University of Technology Sydney (UTS), and the University of New South Wales, and is currently completing a PhD at UTS.

Back to the future: digital cultures and new dialogues

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Footnotes
8.  Associate Professor Lee Stickells, ‘New tools and new mobile, distributed, and embedded in the built and urban environment in a host of ways.”

Nicole Gardner is an architect with fifteen years experience in Adelaide, London, and Sydney across a range of projects including multi-unit residential, and major public transport projects. She has lectured in architecture and design at the University of Adelaide, the University of Technology Sydney (UTS), and the University of New South Wales, and is currently completing a PhD at UTS.

Digital culture crossover: audiences interact with Cellular Tessellation at this year’s Vivid festival in Sydney. Image: Peter Bird.
Bridging the Digital Divide, a roundtable discussion held on 6 August at the NSW Chapter of the Australian Institute of Architects, was convened and chaired by Architecture Bulletin Guest Editor Nicole Gardner. Taking part in the panel were Melanie Bayl-Smith, Director of Bijl Architecture and Adjunct Professor University of Technology Sydney (UTS); Robert Beson, Director of A+MA; Dr Ning Gu, Senior Lecturer University of Newcastle; Dr M. Hank Haeusler, Senior Lecturer and Discipline Director of Computational Design degree at the University of New South Wales (UNSW) and board member of the Media Architecture Institute; Dr Sandra Loschke, Senior Lecturer University of Sydney (USyd); Russell Lowe, Senior Lecturer UNSW; Iain (Max) Maxwell, Senior Lecturer USyd and Director of Supermancorve; Dr Dagmar Reinhardt, Lecturer USyd and Director of Reinhardt Jung Architecture and Design, and Shaowen Wang, UNSW and USyd.

The discussion aimed to move past talk of digital technology as purely an instrument in form finding and aesthetic manipulation, and to address future directions and opportunities for modes of collaboration, techniques and practices in architectural education and the profession. For this reason, Nicola Gardner began the discussion with reference to a critical view expressed by digital design theorist Mario Carpo, in which he suggests that the architectural discipline is yet to meaningfully explore, and thus potentially capitalise on, the collaborative opportunities of the past Web 2.0 ‘digital turn’. Carpo notes that over the past ten years Web 2.0 developments have heralded a new range of collaborative and interactive tools that have given rise to an emphasis on shared agency. Given this, he argues: “Communal making is fast becoming a dominant technical and cultural paradigm of our age, yet with one significant exception: architecture. Architects, for the most part, have neglected or rejected the new digital commons.”

Further, Carpo speculates on why this might be the case; ‘traditional’ ideas of the architectural profession and the authoritative role of the architect creating a barrier to the exploration of the participatory and collaborative potentials afforded by a range of Web 2.0 (digital) technologies, or are architectural projects simply less suited to modes of ‘communal making’ that are being readily explored in other design disciplines?

This provocative quote was met by an almost humorously long pause from roundtable participants, but after Shaowen Wang bravely kicked off, the conversation swiftly took its own divergent course. Wang began by recounting her time in New York in the 1990s, and the educational game changer that was the Paperless Studios run at Columbia University. These studios represented a radical shift in architectural education and were the first real alternative to architectural design as a paper-based process. Here digital technology was pushed to the forefront of the architectural program and participants explored the parameters and potentialities of a range of digital platforms – CAD software - to achieve a complexity of geometry, form and surface that had not previously been possible. Wang noted, when the former dean of the school, Bernard Tschumi, was asked in 2003 to reflect on where we are now, he expressed disappointment as what had begun as a frontier exploration through a range of computational platforms, had now shifted to the dominant use of a limited range of software that produces homogenised design outcomes. Fellow Paperless Studios participant and architect Hani Rashid commented that, “The unfortunate thing is that it tended to stay at the level of the envelope and the formal iteration.”

This tendency of the profession to focus on formal exploration was a view shared by Loschke, who argued that the increased focus on formal language, and on the exploration of geometries and surfaces, has tended to detract from addressing other fundamental questions that are inherent to architecture. She further argued that “there is a certain vanity within the profession” that prevents us from realising that “digital technologies do not necessarily have to be used to address problems of performance and function”. In this way, authorial vanity and ‘captivation’ with form have obscured our potential to recognise and actualise the broader potentialities and larger benefits of certain technologies.

Loschke argued that this is an issue understood by notable figures such as architect and engineer Arno Wals of Design to Production. Wals’s approach to parametric and digital processes concerns exploring solutions for structural and environmental issues, including renowned projects such as the Mercedes-Benz Museum in Stuttgart, the P&G Werstladthaus in Cologne, the new Porsche Museum in Stuttgart, and the Luftansa headquarters in Frankfurt, all in Germany, as well as the Paul Klee Centre in Bern, Switzerland, and the Smithsonian Institution in Washington, US.

Reflecting on the role of specialist consultants on projects, Beson noted that the profession frequently relied too heavily on their input, which might suggest that we, as architects, fail to be experts in our own right. He further asserted that we should be master of our own tools and, for example, must be taught how to use and manipulate code in order that we may critique and improve what is available to us. A re-expanded role and hence increased autonomy of the architect through computational methods was a position shared by several of the panelists throughout the discussion. Though Beson argued for increased autonomy of the architect, this is not to say that we should reassume a traditional role of sole authorship, but rather have a stronger voice within a multidisciplinary framework.

Haeusler, in response, suggested that Wals’s methodology was inherently the thing to teach students. “The understanding that if you have certain kinds of variables and certain kinds of rules, that ‘will enable an outcome you don’t already know. The establishment of the variables and the rules at the front end; that’s what [can] alternatively drive your design’.

For Maxwell a key opportunity of digital technologies, such as computational methods and digital fabrication, lies in a sort of retrieval of the “things [architects] once used to control”; in particular, making. Further to this, Maxwell argued that such technologies enable a way of speaking, a common language, “Whether that’s direct communication through modes of fabrication, through robotics, or through other forms. Or whether it is about dealing with allied disciplines, which once used to be us”. Reflecting on how certain digital technologies can enable new modes of collaboration, he noted that: “Certainly in our practice, we’re doing a lot of projects with people in ways where communication or collaboration is completely flattened. It is amazing that you can have the ability for all the players to participate in the construction of a world of discovery, which is really design method.”

Subsequently this suggests that forms of computational commodity can provide the basis for increased collaboration and knowledge exchange. Yet in our current conception of ‘re-engineering’ the architect is an objective that, Loschle Gardner describes this as computing to take us back 500 years ago…to fabricate directly, to recapture our engineering heritage, to be able to fabricate without intervention’. He proposed that rather than look back to try and recapture the past, the potential lies with education and allowing students to explore the potentialities of technologies. “Look forward. See what these students do with the technologies they have; technologies that full fill roles and are instrumental in ways that were inconceivable five to ten years ago.”

Looking forward, one can see the prominent role research and education can play in the transformation of the profession.

Beyond the consideration of technology in architecture simply pertaining to the tools of design and fabrication, Haeusler turned the focus to a broader technological picture. “We live in a different kind of world than we did 10 years ago; a world with things like smartphones, sensors, and more and more technology in the built environment. Today, any kind of washing machine has more computing power than the computers of 20 years ago. That is important to teach students as well. That trend is completely outside of architecture, however, it will have an enormous influence over how architecture is perceived, what kind of architecture we demand, and how architecture will change.” Certainly, incoming and current students have grown up in a world where digital technologies are part of everyday life. Thanks to gaming and virtual reality software, high school students considering a career in architecture will start their tertiary studies completely accustomed to working in the digital realm and be at ease with 3D spatiality, opening the field to more specific and specialised training.

In Architecture in Formation: On the nature of information in digital architecture, Carpo describes this ‘bigger picture’, to which Haeusler referred, as expressing the nature of inclusive modes – already advanced in other professions – with open-source platforms of exchange and authorship such as the ‘crowd sourcing’ phenomenon.
Crowd sourcing is a process in which an online community contributes to producing work through mass participation; it is an emerging method of design and production that has the voice of an underprivileged public, rather than a specific expert group. Gu said that through such platforms, architectural culture can potentially address broader social issues and allow us to engage as “global citizens.” However, Back-Smith stated: “In order to enable these technologies to upend architectural processes, there does have to be a change in the culture of practice. There has to be a willingness to learn from others. There has to be a dismantling of the pride, the ego and the facades that people start to build around both their practice as an entity, and [also] practice as what we do as architects.”

This shift in the manner in which practice operates is necessary given that the architectural discipline can potentially innovate and benefit through open collaboration and is a matter of time for the right kind of project, not a ‘deal’ project to emerge, which will suit this mode of production, said Gu. Beson agreed that this represented a significant barrier to innovation: “Architects are always too reactive, we’re always waiting for something: when there’s no one better placed within the construction industry to move forward independently and actually do something to change the situation.” He said we should aspire to be “producers, not consumers of technology.”

Throughout the discussion different scales and possibilities of design thinking are discussed. Panel members relied differing visions of the directions digital culture would take in a disciplinary, professional and educational sense. While several of the panelists expressed the view that a range of new digital technologies would afford opportunities to re-engage with roles formerly within the domain of the architect, and to work in more collaborative modes, others, including Haeusler and Wang, foresee a historical moment where “computational design attempts to become a discipline.”

The discussion posed big questions, and while the panel was largely comprised of like-minded ‘technophiles’, the aim was to get into the nitty gritty and uncover examples of how individual practices deal with these big challenges. As Gardner noted in her introduction, new technologies are often met with incredible enthusiasm. Such enthusiasm can be quickly discarded when the software interface is difficult to understand and time consuming, or when it does not easily interface with other existing platforms. Does practice have the time for this? How do we try and bridge the divide between what is happening at universities and what is happening in practices of varying scales? The willingness to explore and embrace new emerging technologies was fundamental to the future nature of the Paperless Studio in the 1990s. Today, Haeusler sees the potential for research and development to provide linkages. “We can do it through universities. By exploring these things with the students, you teach them. So, in the future, they have this kind of knowledge when they come to your practice; in a small or big firm they can apply [this knowledge]”. “This speaks to the common question of how can the graduate use their recently acquired skills and find a voice in the design process, not only in a collaborative sense, but also in a critical sense, with the understanding that digital tools can and should provide far more than a complex and sometimes superficial form-finding process that results in the final production of seductive renderings.”

Reflecting on our education and transition into practice, most central to the design process is a critical, inquiring mind and a constant continued questioning of why we make design decisions and why we employ different tools. As Beson commented on his own approach, “The thing that bugs me is the word ‘digital’, because it is clearly just design. I could not care less about computers. It [technology] allows me to do things that I could not do otherwise; it allows me to be a better designer.”

Returning to the title of the roundtable discussion - Bridging the Digital Divide - the word ‘bridging’ implies a linear progression between practice and education. However, as Reinhardt pointed out, it is “research that nearly sits between the two of them”, thus emphasising a more cyclical relationship in which the three entities [education, research, practice] constantly react and respond to each other, and in which the boundaries cannot always be clearly defined.

Madeleine Rose
University of New South Wales
Sophie Camarri
University of Sydney

Footnotes
3. Dr M. Hank Haeusler
Australian School of Architecture and Design University of New South Wales
The University of New South Wales (UNSW) Built Environment faculty has a longstanding tradition in addressing the nexus between architecture and computing. The Bachelor of Science (Architecture) commenced in 1981, followed in 1998 by the introduction of a computing stream concentrating on producing and documenting preconceived designs through CAD software. From 2008 onwards, the Bachelor of Architectural

Computational Design Thinking
Dr Ning Gu
School of Architecture and Built Environment University of Newcastle
With the emergence of new design technologies, digital design has become a seminal medium in the evolution of architecture, supplementing and challenging traditional practices. To better facilitate the industry’s transition and help it make more informed business decisions, academic institutes are providing the critical understandings about the phenomena based on their research; they will also supply the future generation of designers and specialists possessing the required knowledge and skills through education. At the University of Newcastle, as an ongoing exploration of, and response to, these challenges, the Digital Design sub-committee was recently established in the architecture program. The committee aims to reform the existing communication courses and consider ways of implementing digital design more effectively in the studio. The redesign of the courses will be based on a shared vision of design communication and digital design within the program, and consider the overall learning outcomes, the progression of student learning, and the potential for studio integration. It will begin with a range of minor reforms in 2015, and proceed with majority reforms in 2016. One of the main themes of this curriculum reform is the introduction of computational design thinking and its implementation for design generation and analysis.

The purposes of computational design technologies and methods are to go beyond design documentation and presentation to address more ambitious design processes and issues, such as ideation and generation (through parametric design), and interoperability and collaboration (through BIM). Digital design is beginning to impact not only the visual characteristics of contemporary architecture, but also to create a new paradigm of design thinking. Current design education has been so focused on teaching the ‘tools’, it has often overlooked the needs and adequateness of teaching the theories and principles that underpin the design-application of these tools.

Computational design thinking as an emerging topic is different from traditional design thinking: it formulates problems in a way that enables designers to use computational tools to help solve them; it represents the data through abstraction, such as models and rules, and it generates the solution and alternatives through algorithms (formal procedures of a series of ordered steps). This conceptualisation is an internal process within the digital designer, and can be executed with or without a computer. The challenges of teaching computational design thinking lie in the effective explication and exploration of the approaches and techniques in capturing design knowledge through algorithms, which can then be applied by a computer for design generation.

Academics from the four New South Wales universities recount recent studio outcomes and new directions that address issues of digital culture in architecture.
1. ‘Constructing’ relates to the design of objects and artefacts through computational modes, including gaming engines and digital fabrication

2. ‘Contextualising’ addresses the design of ‘responsive’ environments, including the application of sensors and screens, and the consideration of mobile devices, and issues relating to ‘smart’ and ‘ubiquitous’ cities

3. ‘Calibrating’ concerns design optimisation processes and collaborative decision support software such as BIM.

Program grouping productively links these spheres together, the first being ‘Place and Technology’, which links the performance of buildings with sensory data collected in the built environment. Consequently, this address topics that bring together urbanism and architecture with electrical engineering and science disciplines, namely computer science and computer engineering.

Second, ‘Form and Experience’ addresses the connection between space making, experience, and situational media communication. It draws industrial design, user-experience design, and architecture together with human computer interaction and cybernetics. Third, ‘Space and Documentation’ addresses the spatial assemblies calibrated through digital means and connect architecture and urbanism together with civil and structural engineering. Recent projects that exemplify this approach have included the Orkestra installation—showcased in Luminale in Frankfurt, Germany, and at the Powerhouse Museum for Sydney Design 2014 (see photo above)—and also the Interchanging exhibition featuring a 3D mock-up of a bus stop design generated through computational design software and digital fabrication methods. Unique in Australia, the Bachelor of Computational Design (CoDe) will offer students specialised computational design skills within an interdisciplinary conceptual framework, to provide a greater degree of adaptability to meet the changing needs of contemporary architecture and design practices.

### Transforming Architectural Practice

Jain Maxwell and Dave Pigram
School of Architecture
University of Technology, Sydney

The academy has always been central to the definition and transformation of architectural practice. The University of Technology, Sydney (UTS) currently does this in three ways:

- By theorising the redefinition of the architectural practice itself, as exemplified by Antonio Burke and Gerard Reinmuth’s curations of the Australian Pavilion at the 2012 Venice Architecture Biennale.
- By engaging with the forces that shape the city (politics, power and planning) through the Professional Practice subjects and overarching Masters agenda: The Sydney Metropolitan Project.
- By redefining disciplinary methodologies via computation and robotics; the domain of the authors and focus of this text.

The transformative role of academia was arguably first established by the Beaux-Arts’ Ecole Polytechnique system: architecture’s first formalised schools. The then director Jean-Nicolas-Louis Durand (1760-1834) believed that the institution’s primary task was to explicitly capture ‘discipline-specific knowledge in order to allow its productive transfer’. Durand staked a claim for a diagrammatic basis of architecture in his seminal work, Précis des leçons d’architecture donné à l’École polytechnique (1806). Thus he began the architectural project of the diagram, which served as an abstract descriptive system capable of recording and analysing historical processes—organisation, structure, performance, and geometry—as well as providing a generative framework for disciplinary expansion and transformation. A trajectory in continual revision by almost all ensuing academies, notably: the Bauhaus and, later, Harvard University, following the migration of Walter Gropius, John Hejduk and Peter Eisenman at the Cooper Union School of Art and Architecture, and Bernard Tschumi and Greg Lynn—albeit in very different ways— at Columbia Graduate School of Architecture, Planning and Preservation. The outcome of this focus on procedural design methods is that, as observed by Robert E. Stolar: “the fundamental technique and procedure of architectural knowledge has seemingly shifted, over the second half of the 20th century, from the drawing to the diagram”. At UTS—the first of the Sydney schools to embrace the transformative potential of computational design processes—we are actively engaged in posting the next shift: from the diagram to the algorithm. These are framed via design studios, theory electives and intensive International Masterclasses (Francois Roche, Columbia University; Tom Wiscombe, Southern California Institute of Architecture; Alisa Andraeuskaya, The Bartlett, University College London; Roland Snoeks, University of Pennsylvania; and Philippe Block, ETH Zurich).

We view the visualisation and digitalisation of the rich histories of discipline-specific knowledge evolution. The motivations underlying our position stem from a desire to expand the number and nature of operative design influences. Program, environmental performance, material properties, fabrication constraints, construction logistics, building codes, economic concerns, spatial and aesthetic desires, each collaborating towards enriched architectural possibilities, enabled by computation (code). The control and variation enabled by computation has more recently afforded opportunities to engage advanced modes of computer numerical control (CNC) and robotic fabrication. Building on the work of our practice Supermarinovare and a strong international network of research collaborators (University of Michigan; ETH Zurich; Institute for Advanced Architecture of Catalonia, Aarhus University, Denmark). UTS is now establishing a world-class robotic fabrication facility.

The key mandate of architectural education should be to expand the discipline’s possibilities and self-awareness via a focus on its techniques of production. Algorithmic processes represent the latest evolution of the academy’s role in serving to transform the discipline. The drawing of texts (compositional) objects is rejected in favour of the explicit definition of the relationships and procedural steps necessary to their formation.

### Engineering Architecture - SmartStructuresLab

Dr Dagmar Reinhardt
Faculty of Architecture, Design and Planning
University of Sydney

Through computational methods, design research paralleled with practice-based models in digital architectural education can support intense dialogues between students, researchers and professionals. This shift from standard educational curricula towards collaborative approaches between different disciplinary areas marks a significant change, specifically in the work between architects and engineers.

A recent postgraduate studio of the Master of Digital Architecture at the University of Sydney, SmartStructuresLab.2014, explores precedents of Frei Otto, Heinz Isler, Eladio Dieste and Felix Candela to rethink the legacy of recent advances in digital design. Computer-aided design (CAD) and computational design, the control over rule-based designs with a mathematical logic becomes possible. SmartStructuresLab.2014 approached an engineering of architecture in process, as a dialogue between analogue design models; computational design series, engineered structural analysis and optimisations, and through continuous digital fabrication of 1:1 prototype projects; 3D-skeleton structures and 3D printed form studies.

SmartStructuresLab.2014 employed for the architectural design process the advanced structural engineering software karambu (www.karambugmbh.com), developed by Bollinger-Grohmann-Schneider, in order to optimise spatial and structural performance. In a workshop with Clemens Preisig, Matthew Tam and Tascha Rohlenberger, the studio explored design iterations, structural behaviour and material affordances that were fully integrated and seamlessly crossing between 3D modelling (Rhino/McNeel Rhinoceros), parametric design (Grasshopper) and structural analysis (karambu) environments. Thus, a descriptive language of complex curved surfaces becomes available that combines parameterised geometry, finite element calculations and optimised algorithms in rule-based scenarios at the intersection between digital and analogue modelling. As a consequence, the resulting design models develop for computational processes for design, compression, or hybrid systems, to be deployed as grid shell, masonry, concrete or membrane structures. In this research design, a systemic process of collaborations and sharing design intelligence advances knowledge in the field of digital architecture education. By developing potentials for methodologies as interdisciplinary practice, a horizontal learning structure empowered paradigms of the digital — through advanced geometries, structural engineering and digital fabrication — that can act as pilot on and prototypes for, new architectural and engineering approaches.

This postgraduate Master of Digital Architecture Research studio at the Faculty of Architecture, Design and Planning, University of Sydney was led by Dr Dagmar Reinhardt with Eduardo de Oliveira Barata, UFOPsyDny, Rob Beson, ARMA, and Alexander Jung, Reinhardt Jung Architecture. Prototype structures were displayed as performative collaboration in a multi-disciplinary installation commissioned by Art in Threads for a Brand X exhibition, and the overall research was shown as part of the Powerhouse Museum Sydney Design 2014.

### Footnotes


Digital design and the profession

Cellular Tessellation, an architectural installation developed for Vivid Sydney 2014, is a softly glowing, geometric form that responds to movement to create an ever-shifting space of pattern and light. Chris Knapp and Jonathan Nelson from Bond University discuss their involvement in the project, and its implications for digital practice and research.

The separation of ornament from Modern architecture—declared famously in Adolf Loos’s essay “Ornament and Crime” placed space as the primary concern of architecture, with evidence of craftmanship and symbolism removed from the canonical and conventional public buildings of the past century. Yet, Harvard Graduate School of Design’s historian Professor Antoine Picon notes the widespread return of ornamental expression in architecture today is “inseparable from the massive increased importance attached to surface.”1

Today is “inseparable from the massive increased importance attached to surface.”

The research undertaken at Vivid served as a vehicle for examining architectural questions and craft. Ornament is a vehicle for examining architectural questions through the expressive potential of architecture today.2 This positions architectural practice within a relatively new space where the opportunity to understand, simplify and control information related to construction practice – and to even engage in the act of construction itself – presents a novel opportunity to re-establish participation in building procurement for the architect.

Cellular Tessellation

The project brief’s very loose requirements – to achieve the spectacle of illumination for pedestrian interaction on a very tight budget – offered an opportunity to explore the aforementioned areas of interest through its geometric complexity, fabrication process, computational design, and structural integration with the building envelope.

The CT project employed innovative computational form-generation techniques to create and resolve the geometry and componentry of the pavilion. The project is fully parametric and digitally fabricated from flat sheet materials that are folded and interlocked to create a shell comprised of 390 unique cells. Aluminium composite panels form the fundamental pavilion structure, which is akin to a rigid but non-hierarchical net of self-jigging elements. Each cell is in-filled with 3 millimetre thick acrylic sheet and clad with 1.5 millimetre HDPE skin to house 100 LED meters of light emitting diodes (LED’s), which are wired in series and capable of displaying 16 colours.

Advancing practice

When the early stages of digital design and computation tools entered the architecture studio in the 1990s, the focus was on form with little regard for constructability. However, the tools we have access to today – namely McNeel Rhinoceros with the plug-in Grasshopper in the case of CT – are very inexpensive and robust, enabling one to have total control of fabrication as well as geometry in a way that is purposeful and intentional. With tighter integration and intelligent incorporation of the material and tool constraints into the design process as one of information management, questions of both technical and formal complexity can be addressed in a profound way that was not possible previously in the context of construction. This positions architectural practice within a relatively new space where the opportunity to understand, simplify and control information related to construction practice – and even engage in the act of construction itself – presents a novel opportunity to re-establish participation in building procurement for the architect.

The CT project exemplifies this proactive attitude toward construction and materiality. In this case, a smooth or curving geometry is utilised to address multiple contextual relationships; namely the direction of entry to the pavilion by visitors and their subsequent restriction to highlighted views, which are then punctuated by revealing both the Sydney Opera House and Sydney Harbour Bridge.

Additionally, the curving form of the project provides a continuous and singular structural solution – a monocoque of integrated cells and skin that distribute loads in a multivariant manner. To achieve this, the primary surface geometry was panelised into relatively equal cells using a custom ‘definition’ (for example, code) that is similar to, but a more highly attuned version of, the Voronoi algorithm.

Successes and shortcomings

The Voronoi diagram has, of course, been a very popular design motif in recent years, but it is not without its problems in respect to digital fabrication. Designers generally attempt to achieve a controlled randomness when using it, and while it tends to be acceptable in representational format, it often fails during fabrication. Common problems include highly irregular shapes that are difficult to fabricate with extremely short segments, severely acute internal angles, and cell sizes that vary greatly and are prone to becoming awkward.

The resolution of geometric, doubly curved surfaces using a Voronoi panelisation with very tight tolerances and zero errors is a highlight of CT, and such precision is the outcome of an approach concerned with craftsmanship. Not only did this lead to a structure with a compelling aesthetic resolution, it also resulted in a very strong, rigid structure that could accommodate six workers standing on it. The even panelisation allowed us to create cells with very tight and predictable tolerances for fabrication and assembly, resulting in variations of less than 5 millimetres over the 9 metre length of the pavilion.

An aspect of digital fabrication projects that is still to be resolved is that of assembly. Projects such as these are seldom achieved without copious volunteer labour. Fortunately, the process enables assembly by unskilled individuals, however, ironically, it also proves that the more digital fabrication, the more by-hand assembly. Three thousand bolts do not tighten themselves, and in this case the man hours totalled into the thousands. One shortcoming of CT was due to over-ambition. The project was conceived as incorporating a high degree of user interactivity through the use of motion sensors and programmable LEDs. At the end of the day though, we were simply happy to see the lights come on at all in time for the festival launch, despite lacking true actuated interactivity. While less than originally conceived, the subsuming and atmospheric effect of light within the tunnelled volume of the project still provided a satisfactory level of user experience. The three-week duration of Vivid pushed the wiring and lighting to the limit, but overall the project was robust enough to withstand crowds totalling 1.4 million over the length of the festival.

The value of Vivid

At the conclusion of the 2014 iteration of Vivid Sydney, The Guardian newspaper published a piece with the headline “Vivid Sydney: Festival for the Instagram generation, stunning but superficial!”3 It is easy to brand festivals like Vivid or Wellington LUX in New Zealand, as mere entertainment for the masses with little substance; for some reason, a parade of illuminated structures and projection-mapped displays is a simple but effective formula to entice participation by the masses. From a critical perspective, it can be seen as excess, populist and spectacle rather than ‘proper’ art.

Yet for researchers and practitioners alike, these festivals offer an ideal opportunity to undertake meaningful and productive research activities, especially one that provides some funding and a very loose programmatic brief.

As is the case with Vivid Sydney, the CT project provided the opportunity for us to ‘practice what we preach’ in the classroom about advancing the state of architectural practice, and, more so, to test out strategies for computational design, fabrication and social engagement where most digital work never gets past the computer screen. This work provides an important means for the advancement of architectural technology, expression, and construction within an educational and professional context.

Chris Knapp is Assistant Professor and Discipline Leader of the Abedian School of Architecture, Bond University. Concurrently, he directs Built-Environment Practice and is a PhD candidate at RMIT.

Jonathan Nelson is an Assistant Professor and founder of the Architecture Fabrication and Research Laboratory at the Abedian School of Architecture, Bond University.

References

The effect of digital design technology on student learning in architectural education

Nicholas Foulcher
University of Newcastle

The fabric of modern day life and business is exposed to a constant stream of technological innovation. As such, fields of design education and research are in a dynamic state of response. Over the past two decades, the growing popularity and gradual acceptance of digital technology has created a challenge; not only for professional architectural design, but also for educators in the design faculty. Schools and faculties of design and architecture are expected to develop and upgrade the traditional curriculum in order to create a program that aims to produce graduates possessing high competency in digital technologies. Accordingly, educators are experiencing a cognitive dissonance and engaging in an ongoing debate surrounding the role of digital technologies in the curriculum.

This PhD research, The effect of digital design technology on student learning in architectural education, seeks to explore the phenomenon of digital technologies in architectural education, assessing issues of the impact of digital technologies on the discipline and professional practice. We see our research informing developers in the market of digital design, aiming future development of digital technologies in this industry.

Nicholas Foulcher is a casual academic undertaking his PhD candidature at the University of Newcastle, and is the principle of design consultancy thebighthink.

Documenting generative architecture: A practice-based method for describing a generative architectural approach using design patterns

Eduardo de Oliveira Barata
University of Sydney

The research is informed by two key components: first, generative design, which, in itself, can be subdivided into categories such as design logic, structure and materialisation; and second, the packaging of this information in a manner that is transferable.

In order to address the first key component, the research instrumentalises generative or computational architectural approaches, which can be defined as procedural design outcomes whereby the end results are characterised by a logical, often mathematical framework through explicit rule sets. These can result in varied, unpredictable and dynamic systems, patterns and constructs.

In order to address the second key component and develop systems for transfer, the research identifies an existing methodology that describes design approaches in an abstract, transferable manner in the form of design patterns. A design pattern is a method of developing solutions for design problems in a specific field as reusable descriptions, originally conceived by Christopher Alexander in the late 1960s. These design patterns will define a particular problem and an anticipated approach for solving this problem. A number of design patterns can be defined as a pattern language.

The research aims to realise a tool that clearly illustrates the documentation process of generative architecture by testing the hypothesis that design patterns are a useful method for doing so. The research will develop a series of documentation patterns that describe these generative processes alongside each case study, and aims to cultivate an initial pattern language that encapsulates generative design approaches.

Eduardo de Oliveira Barata is the co-director of Urban Future Organization (Australia) and holds the position of design tutor at the Faculty of Architecture, University of Sydney for the Masters Digital Architecture Research Studio.

Temporary urbanism in a network society: An approach to spontaneous design of space applying digital media

Homa Rahmat
University of New South Wales

In a host of ways people’s use of digital technologies is changing urban rhythms and the experience of time and place in cities. Many scholars have argued that the use of digital information and telecommunication systems has resulted in less emphasis on human interactions that require physical proximity. More recently this has extended to geolocation-based and smartphone applications, which are further argued to have catalysed shifts in ‘place’ occupation and regulation. Additionally, as a widely connected digital network of people are now generating place-based information through a host of new media platforms, it is suggested that urban environments are being perceived in new ways. This PhD research argues that architectural and urban design practice can capitalise on better understanding these new forms of perception as they represent new ways to give focus to ‘personal’ understandings of spatial use and experience.

Networked digital technologies have not only facilitated new modes of perception, in parallel they have also contributed to generating new design tools and methods to architectural and urban design. More specifically this research explores the relationships between these new modes of perception and participation with consideration of ‘temporariness’ that is, temporary interventions in urban space that have been enabled through digital platforms and tools. It then investigates how the emerging culture of spontaneous actions and real-time expressions in this new media space finds expression in physical places. A case study included in this research is the DIY Rainbow Movement: an example of community action that has created rainbow pedestrian crossings in chalk (see image below left). This illustrates how the individual actions of people can be brought together in a singular process through social networking websites. Tracking the flows of urban data by retrieving them from Facebook and Twitter application programming interfaces reveals the spatial outcomes of social interaction in virtual space.

Such analysis serves to advance our understanding of the extension of people’s abilities through new media platforms to appropriate and personalise their physical realities.

Homa Rahmat is a PhD student at the School of Built Environment, UNSW since February 2014. Her area of interest is the interaction of virtual space and physical places.

Saudi culture and the introduction of digital architectural influences and interactions

Wajdy Qattan
University of Technology, Sydney

Why are newer digital design skills and practices such as architectural computation and the design of geometric and executable components of design processes needed? More specifically this research explores the relationships between these new modes of perception and participation with consideration of ‘temporariness’; that is, temporary interventions in urban space that have been enabled through digital platforms and tools. It then investigates how the emerging culture of spontaneous actions and real-time expressions in this new media space finds expression in physical places. A case study included in this research is the DIY Rainbow Movement: an example of community action that has created rainbow pedestrian crossings in chalk (see image below left). This illustrates how the individual actions of people can be brought together in a singular process through social networking websites. Tracking the flows of urban data by retrieving them from Facebook and Twitter application programming interfaces reveals the spatial outcomes of social interaction in virtual space. Such analysis serves to advance our understanding of the extension of people’s abilities through new media platforms to appropriate and personalise their physical realities.

Saudi culture and the introduction of digital architectural influences and interactions

Wajdy Qattan: an architect holding Master of Advanced Architecture in Design, Urbanism and Master of Islamic Architecture degrees. He is a PhD candidate in the School of Architecture at UTS. He has an interest in architectural design, Islamic architecture, and new designing technology with a range of research activities permeated his practice since 2003.

Footnotes
MOOCs: the future of online learning. Will it affect face-to-face education?

Massive open online courses, or MOOCs, were first developed around 2011 at Stanford University by Sebastian Thrun and Peter Norvig. Typically a MOOC is a single course that is free; it has no admission requirements; it provides no credit, although some universities offer ‘certificates of completion’, and the student’s attendance is flexible. Assessments are generally optional and, in some instances, the course could be compared to viewing a David Attenborough documentary on the internet, but with questions provided at the end that are graded online.

From a student’s perspective, particularly a causal lifelong learner, they appear cost-effective when compared with university attendance, which in Australia could cost several thousands of dollars. Their title it says all, they are massively subscribed, according to University World News, Thrun’s first course attracted 160,000 students. However, Inside Higher Ed suggests that the dropout rate is nearly as dramatic as the initial enrolments’, suggesting that the ability to deliver student satisfaction in a MOOC would be similar to a traditional course and vary according to the course and the lecturer running it. Several universities in Australia moved quickly in 2012 and 2013 to develop online courses on specific subjects that have broad appeal to both established and aspiring architects. Internationally, there are many MOOCs available from different providers [see http://www.moooc-list.com/]. Udacity, Coursera and edX are well-known in the MOOC space, delivering a broad range of courses on many diverse topics. A quick review of Coursera at the time of writing this article provided a list of eight courses relevant to an architect or those interested in architecture.

The new national Curriculum on Design and Technologies could be an opportunity for architects to have an input into education in our schools, suggests Beverly Garlick.

Over the past five years, the Australian Curriculum Assessment and Reporting Authority (ACARA) has been responsible for developing the national curriculum, recognising the educational outcomes of all young Australians. Of particular importance to architecture is the development of the technologies component of the curriculum. This section has been divided into two parts: one, design and technologies; and two, digital technologies. Architecture will be taught primarily within design and technologies; however, it could well straddle the two disciplinary areas.

While the curriculum is national, its implementation lies with the individual states and territories. Over the past five years, the Australian Curriculum Assessment and Reporting Authority (ACARA) has been responsible for developing a national curriculum to improve the educational outcomes of all young Australians. ACARA has been responsible for developing a national curriculum to improve the educational outcomes of all young Australians.

Beverly Garlick graduated in architecture from the University of Newcastle. After moving to Sydney, she worked for Allen Jack and Cottier for several years followed by 10 years for the Government Architects Branch (now the NSW Government Architects’ Office) before establishing her own practice in Leichhardt where she continues to practice.

For MOOCs
- Alternative to university credentials, which suits gen Y and possibly business alike; a positive for students
- Cheap fees; a positive for students
- Potential nation by the best in the world; celebrity professors; a positive for students
- Skill supplementation; a positive for students
- A hook to entice potential students to “formal” degrees; a positive for providers
- Cost effective; a positive for providers
- Flexible; a positive for students and providers

Against MOOCs
- Lack of on-campus experience, a negative for students
- No credit for formal courses; a negative for students
- Affects local universities; a negative for providers

Early intervention

The national Curriculum on Design and Technologies could be an opportunity for architects to have an input into education in our schools, suggests Beverly Garlick.

The engineers already have a similar program in place. It is most important that projects are funded properly and architects should not be doing such work for nothing. As well, projects without adequate funding might not be such a problem. The engineers already have a similar program in place. It is most important that projects are funded properly and architects should not be doing such work for nothing. As well, projects without adequate funding might not be such a problem.

Beverly Garlick graduated in architecture from the University of Newcastle. After moving to Sydney, she worked for Allen Jack and Cottier for several years followed by 10 years for the Government Architects Branch (now the NSW Government Architects’ Office) before establishing her own practice in Leichhardt where she continues to practice.
New tools and techniques for learning in the field

A study investigating the potential for new forms of field-based learning recommends educators proceed with caution.

Associate Professor Lee Stickells from the University of Sydney explains why.

The growing ubiquity of mobile digital technologies in the infrastructures of daily urban life has profound implications for architectural education. Amy Kulper and Sheila Crane argued in a recent issue of the Journal of Architectural Education that such technologies are a vector of the "new forms of architectural agency that students are presented with as they move into the profession". With this context in mind, recent research at the University of Sydney explored the potential for mobile digital technologies to 'emplace' students in the theories that shape the insights and practices of architecture and urbanism.

The Sydney study was a component of a national research project, led by Associate Professor Hannah Levi and Dr Wally Smith at the University of Melbourne and funded by the Federal Government's Office for Learning and Teaching. The project, New tools and techniques for learning in the field: studying the built environment, aimed to investigate the potential for new forms of field-based learning in university education stimulated by recent advances in mobile digital technology. The project team conducted four interrelated but distinctive studies to evaluate a range of innovative techniques for fieldwork in built environment education.

The techniques developed drew on readily available mobile technology to create appropriate digital learning tools. Studies one and two (University of Melbourne) focused on custom-built tools in the form of an iPad/iphone tour of city buildings, and an iPad tour of an urban landscape. Study three (Monash University) used existing apps for physical light measurements of an interior built space. The University of Sydney activity composed study four: taking mobile platforms as a target for students to design for, and developing mock-up screenshots apps informed by the concepts of urban thinkers applied to particular city locations.

The project team examined how students developed test and graphical materials for a mobile medium that defined key urban design concepts and theories, and linked those concepts with local environments to manifest their qualities. They also considered the value of the activity itself — and of mobile and digital media more broadly — to teaching and learning in architecture and urbanism.

The app design activity focused students' engagement with the work of a key thinker in urban design history through fieldwork: the city was explored through enacted theory. Fieldwork activities can be understood as excellent platforms to test theoretical learning gained in the classroom, and the primary aim for the student activities in this study was to link the exploration of theory (and its history) in urban design with the actual formation of urban environments.

More specifically, framing students' thinking about content creation in relation to mobile devices as part of a fieldwork activity was seen as a potentially powerful way to reinforce those linkages and relevance.

The fieldwork study techniques and the supportive tools developed through the national project broadly addressed the structure of mobile learning activities, the design of mobile learning materials and instructions, the design of mobile assessment tasks, the greater integration of field activities into classroom teaching, and the student creation of mobile content. While the Melbourne and Monash studies (one, two and three) did this through testing the use of devices in various fieldwork contexts, the key difference for the Sydney study (four) was its use of a mobile device's potentiality as a context for thought, through the task of designing a mobile app concept.

The Sydney study, like the larger project it sat within, offers a caution against the uncritical embrace of mobile technologies as a way of improving learning in the field. As recent learning in the digital humanities has shown, the use of digital and mobile technologies for learning requires careful attention to the 'computational turn' and its risks to creativity and deep learning. We suggest our app-design activity shows the positive possibilities for the use of mobile technologies as a context of thought in fieldwork — the exercise was able to be "less about the devices, and more about an activity... which is a practice of embodied space in the digital age".

More information about the New tools and techniques for learning in the field: studying the built environment project and the four studies can be found at:

http://mobilefieldworklearning.wordpress.com/2014/02/02/new-tools-and-techniques-for-learning-in-the-field/
CmyView is an app that maps your walk and shares your views about the future of places you care about.

Dr Cristina Garduño Freeman shares her vision for an innovative mobile tool that is currently being developed as a result of a successful crowdfunding campaign made possible through a joint venture between Deakin University and Pozible.

CmyView is a research project that investigates how mobile technologies can facilitate new ways to share, understand and experience the connections that people have with places. Led by Dr Cristina Garduño Freeman, CmyView focuses on the way in which everyday kinds of participation, such as photography and walking, can capture people’s unique views about the places they visit and inhabit.

The project arose from collaborations with Super Sydney, a volunteer community group now operating under the auspices of the Australian Institute of Architects, whose mission is to invite people to share their ideas about the future of their city and build a metropolitan community spirit through creativity and sharing.

CmyView aims to deliver a tool and a methodology. The tool will be a mobile application for smartphones intended to facilitate two kinds of participation. The first experience will allow people to map their own walks and then share them on CmyView. Using spatial mapping technology, the app tracks the route walked and connects this with photographs taken along the way. People will be able to comment on the photographs they take in order to tell others why they are interesting or important aspects of the places they have been. CmyView then packages the route, photos and comments into a shareable walk that others can participate in.

The second experience enables people to engage in one of the contributed walks on CmyView and to share the built environment through someone else’s views. The walk in this mode becomes a visual treasure hunt where the photographs and comments of the contributor act as signposts that guide the experience. By engaging in one of the shared walks on CmyView people will be able to see what is important to others, how they value these aspects of the built environment, and consider how this affects their own views. Mapping and sharing, and engaging in walks on CmyView can be done individually or in groups. CmyView as a tool and platform allows individuals to contribute their ideas, share these with others and connect through an asynchronous informal sharing of social knowledge.

CmyView also delivers a methodology that explains how people’s participation through walking and photographing can be a way to evidence social value. The methodology also seeks to understand how a set of walks, and their component routes, photographs and comments, can be analysed in order to understand the intangible connections that people have with places. By evidencing social value in measurable ways, the methodology seeks to incorporate these important aspects of our relationship with the built environment into the existing decision-making processes of corporate and government institutions.

The methodology also considers how walking and photography can transform the way we assess social value and carry out community consultation. Walking is central to human existence. In her book Wandering, Rebecca Solnit offers a cultural history of walking where she draws together the ways in which walking is embedded in daily life through examinations of its role in pilgrimage, meditation, evolution and even landscape forms such as the labyrinth.1

Walking is a form of transport, a way to increase fitness, or even simply a means to unclutter the mind. Research shows that taking a walk has positive effects on creative thinking. Being physically active through walking can change our mental state.2

Similarly, new research in the social sciences makes an interesting case for developing creative and reflective ways to understand people’s sense of their own identity or attributes to specific issues. Rather than the direct ‘questionnaire’ approach, academics such as David Gauntlett are exploring the way in which creative practices, such as making things or, in this case, taking photographs, can offer a reflective process for individuals and thereby give a richer and deeper understanding of the social processes taking place.

While many apps exist that can track your walk, or take photographs and share them online, such as MapMyWalk or Instagram, CmyView is unique. The research is innovative, not only because of its practical and theoretical contributions to the fields of architecture, media and heritage, but also technologically within the field of information and analytics. The CmyView app will simultaneously bind user-generated content via a social topic and a physical space, thereby extending the experience of social sharing visually and spatially. This will also enable advanced analytics due to the additional semantics. Furthermore, employing mobile technologies to reconsider processes, such as community consultation, can change them from a unidirectional activity centred on data collection, to bi-directional social activity. This potentially builds community through its online participatory culture.

Research funding

Participation is also at the heart of realising CmyView. The pilot has been made financially feasible through Deakin University’s project Research my World, which is an innovative collaboration with Pozible, an Australian crowdfunding platform. Recently, universities and academics have begun to explore the opportunities that crowdfunding offers for delivering small modest research projects CmyView successfully raised 122 per cent of its $6,000 target. While crowdfunding raises questions about governments’ role in funding academic research, it has the benefit of creating opportunities that crowdfunding offers for delivering small modest research projects CmyView currently in its pilot stage, which will resolve the app’s methodology and design experience: The aim of this initial phase is to run two small ‘walkshop’ case studies in Sydney and Geelong that will enable a ‘proof of concept’ of the mobile app to be developed. This will also allow substantive financial support to be sought for the project’s full development. CmyView is an opportunity to develop new innovative approaches to the enduring question: ‘What do our places mean to us?’ As part of the 2014 Sydney Architecture Festival, CmyView, in conjunction with Super Sydney, will be running ‘walkshops’ that will contribute to the development of the project.

For more information visit www.sydneyarchitecturefestival.com.au

Dr Cristina Garduño Freeman completed her Doctorate in Heritage, Architecture and Media at the University of Technology, Sydney. She investigated the social value of the Sydney Opera House through its online participatory culture.

Footnotes


CmyView is a project led by Dr Garduño Freeman in conjunction with the Socio-Cultural Ecologies Group at Deakin University (Dr Marjana Loncanovska, Dr Ursula De Jong, Dr David Reynold and Dr Diego Fullaondo from the School of Architecture and Built Environment, with Dr Ku-K-Leong Org from Business Information and Analytics) as well as Super Sydney (Tim Williams, Gillian Redman-Lloyd, Eva Rodriguez Riestra, Michael Zanardo, Claire Mallin, Miya Krause, Karen King, Stephen Pierce, and Susan Carol).
180 Thomas Street by Bates Smart

Located on a prominent corner in the heart of Sydney’s bustling Haymarket, 180 Thomas Street was won through a City of Sydney Design Excellence Competition and contains 15,000 square metres of commercial accommodation built over an existing building.

Julian Anderson, Associate Director at Bates Smart talks us through the project.

The existing building, client and site presented a number of complex design challenges. The original building was built with columns and a centrally located lift core integrated into its design to cater for the construction of a new building over the top. The expectation on commencement of the design phase was that this existing lift core would be extended up and through the new building, resulting in a traditional centrally core floor plate. Further, the client, TransGrid, suppliers of wholesale electricity within New South Wales and anchor tenant within the building, had particular aspirations for their fit-out that informed the design of not only their tenancy but the distribution of the primary built elements. In addition, they were committed to achieving the highest standards of environmentally sustainable building.

The site required a special response, both to the rich local historic context and the rapidly developing local built environment. Working collaboratively with structural engineers Enstruct, a design was developed that located six mega trusses on the roof of the existing building to take the loads of the new building and transfer them onto the existing structure. Importantly the introduction of these trusses allowed the building to dramatically cantilever out westwards, maximising floor space for the client.

Building efficiently and expeditiously was one of the key requirements of the TransGrid brief in order to minimise risk and disruption. The use of steel facilitated this outcome, maximising the potential for off-site fabrication and quicker erection due to less time spent on site. Further, by utilising a steel composite structure, including steel columns and a ‘bondek’ slab system, the overall mass of the building was reduced by a third when compared with a concrete framed structure. This provided the opportunity to construct an additional floor of accommodation on the site, a proposal that was supported by the City of Sydney who awarded bonus floor space as well as additional height due to the project satisfying the criteria for ‘design excellence’. Locating the six trusses on the roof of the existing building enabled all of the building’s major plant to be located in the resultant internal spaces. The complexity of designing the services in this space, constrained and divided by the webbed trusses was successfully undertaken by Arup working in a BIM environment. The result is a building with a clean roof line, unencumbered by bulky plant.

As anchor tenants of the building, TransGrid sought the creation of an environment that would foster communication, allow for flexibility and adaptability of the space into the future, maximise the prime views towards Darling Harbour, and achieve separation and privacy from the adjacent residential building that is built up to the site boundary in some parts. These requirements informed the manner in which the cores were arranged on the floor plate.

The design approach challenged the assumption that the existing centrally located lift core within the existing building would be carried on up through the middle of the new building. The new lift core was located on the western edge of the floor plate and designed as an enclosed glass volume, expressing a clean roof line, unencumbered by the vertical movement of the lift cars and tenants within. This served to activate the public domain adjacent, a space that is soon to be refurbished and renamed the Goods Line, Sydney’s version of New York’s High Line.

The escape stairs, service risers and staff amenities were located on the east side of the building, providing a visual buffer to the adjacent residential project. Locating the lifts on the western perimeter and stairs and services to the east led to the creation of a contiguous 1,500 square metre floor plate, which provided a maximum of connectivity and flexibility both for TransGrid and future building tenants.

It was important to provide the building with a strong presence, particularly due to its location across from the Frank Gehry designed University of Technology, Sydney building. The architectural form reinterprets the semi-industrial linear forms of the historic Haymarket to create a contemporary building that respects the diverse scale and content of the area. The form is articulated into a series of seemingly random, stacked horizontal volumes of varying height. Each facade type responds environmentally according to its orientation.

The fit-out received a Green Star As Built Certified Rating of six stars, one of only four to have achieved this rating in New South Wales. In awarding this rating, the Green Building Council Australia confirmed that the project had achieved ‘world leadership in environmental construction’. The base building was successful in achieving a 5 Star Green Star As Built Certified Rating by incorporating measures such as passive solar shading, chilled beam technology and rainwater harvesting.

The building is nearing full occupancy and is now awaiting completion of the adjacent Goods Line before its benefits are fully realised and its place within the city is affirmed.

The building being placed on the roof of the existing building. Image: Brett Boardman.
Architecture Bulletin

**Monditalia**

This 12 minute video installation by Ila Bêka and Louise Lemoine is a research based installation by Folder, mapping the “variable border” of the watershed defining the Italian/Austrian alpine border. A projection onto a 3D topographic model shows the transformation of the border from 1920 until present day. Alongside sits an automated drawing machine, tracing the border onto a stack of maps by receiving hourly co-ordinates from solar powered GPS sensors installed on the Similaun glacier. Together, they illustrate the fragile condition of the geopolitical line, melting away as the climate changes.

**Highlights from the Arsenale**

**Italian Limes** is a research based installation by Folder, mapping the “variable border” of the watershed defining the Italian/Austrian alpine border. A projection onto a 3D topographic model shows the transformation of the border from 1920 until present day. Alongside sits an automated drawing machine, tracing the border onto a stack of maps by receiving hourly co-ordinates from solar powered GPS sensors installed on the Similaun glacier. Together, they illustrate the fragile condition of the geopolitical line, melting away as the climate changes.

**Matt Chan** presents highlights from the **Monditalia** exhibition at this year’s Arsenale.

A camera follows the lonely figure of Italian architect, Stefano Boeri around the island of La Maddalena in Sardinia, as he walks us through the purpose-built complex designed to host the 2009 G8 summit that was abandoned barely a month before its opening; the project is a modern ruin. At the final hour, former Italian Prime Minister, Silvio Berlusconi—who harboured an intense dislike for the G8 summit that was supposed to move the event to La Maddalena in Sardinia, as he walks us from the Giardini, and Monditalia in the Arsenale.

Koolhaas thought the Arsenale was too complex and too vast for the Architecture Biennale to occupy on its own. His curatorial strategy clearly reflects the view that architecture is not autonomous and for the first time we see a collaboration between the Architecture, Cinema, Dance, Theatre and Music Biennales. Koolhaas resolves the complexity of the space, through bisecting it down the middle, leaving two distinctive programmatic bands, one for architecture and the other for film. The bands are only interrupted by the insertion of performance spaces, however the aim, says Koolhaas is “a single environment with a single combined program, creating a subtlety of reading with an enriching character rarely seen”. By skipping the current generation of star architects and the production of star architecture, Koolhaas has created an infinitely more nostalgic tone, full of the ideology that was present at the beginning of his career. As he willingly relinquishes his term as a star architect he gives oxygen to the rise of a new Italian avant-garde. His interest has clearly shifted towards a more modest and thoughtful practice where the direction demands a genuinely inquisitive and ultimately more critical view of architecture’s status quo.

"This biennale is not about looking at projects; rather, it investigates conditions of our modernity affecting and surrounding architecture."
There are generally two camps of digital architecture texts. The first are those that critique and hope to explain the shifts of production that make the digital so unique and perplexing. The second are those that venerate digital outcomes and technologies, and have made them icons by which the profession frames what digital architecture ‘is’ (or could be). The new iteration of the eVolo series sits firmly in the latter.

*eVolo: Digital and Parametric Architecture* opens wearing its intent on its sleeve: “It’s a great time to be an architect! No other period in human history has seen this speed in the advancement of architectural design.” And on that note, the book does not disappoint. It catalogues some of the most innovative and important digital projects from the past few years, including Michael Hansmeyer’s columns, Philip Beesley’s responsive systems and Fabio Gramazio, Matthias Kohler and Raffaello D’Andrea’s drone construction techniques.

The magazine is a catalogue of developing modes of digital representation and the ‘pornographic’ renders and photographs that have become synonymous with the technology. However, for the most part, the actual explanations of the works are superfluous simply because the authors do not explain the reasoning behind them clearly enough to the audience. For example, Hansmeyer’s rationale is radically different to that of Supermanoeuvre’s, even though they both fundamentally reach their outcomes through algorithmic methods of design. The book, therefore, is an unconnected collection of unrelated positions and projects rather than a curated representation of current digital design thinking. Rather than providing useful explanations on the profundity of the more abstract projects – most notably *Swarm Materiality* or *City Breeder* – the text dumsped down the implications these works could have on the future of not only digital architecture, but architecture itself. The text makes it very clear who the intended audience is in those who are learning about and/or have a keen interest in digital architecture, but are not yet familiar with its plethora of theories and technologies. Irrespective of the target audience, the projects contained within the magazine are easily enough to inspire anyone from the student opening Rhinoceros for the first time, the practitioner looking at new modes of architectural production, and all the way to the most hardened of digital architects.

Nevertheless, Carlo Aiello is right, “It’s a great time to be an architect!”, and this magazine will find a home in my subject reading lists for years to come.

Matthew Austin is Director of EndOfLine and a casual academic and tutor at the University of Sydney and the University of Technology, Sydney.
The Colloquium brings together policy makers, architects, urban designers and government to consider the themes of growing, connecting and improving Greater Sydney.

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