

Encountering Drawing

Sarosh Mulla, Aaron Paterson, Marian Macken

This collaborative artistic research in architecture explores contemporary performative drawing practices within architecture. It investigates full scale drawing's potential for us to inhabit, occupy and be immersed within drawing. In addition, it suggests ways in which speculative drawing and exhibition practices, which sit beside professional practice, influence developing architectural spatial propositions and built work.

Inhabitable drawings I: *Drawing the Room | Drawing within the Room* (2019–2020)

Architectural drawing is primarily seen as producing and documenting future buildings. These drawings picture miniature versions of as-yet-unbuilt spaces, simulations of rooms that will be inhabited in the future. Architects spend time with the drawings that they create: eyes and hands move over both the drawing's physical surface and represented space. Reading the sketched marginalia on physical copies of these drawings, we sense the duration of the architect's imagined inhabitation of the rooms depicted during the design process. The architect and client are future inhabitants of these drawings, and the space of the plan may be seen as a surface over which we travel.

The notion of the inhabitation of architectural drawings usually refers to this imagined self within orthographic representations of a future built project. We put ourselves within the drawings we make, occupying the emerging spatial proposition, imagining inhabitation. Paul Emmons writes that this inhabitation is 'as if occupying the future building rather than looking at the drawing from outside as an object. Architectural design is a projective act of imaginal embodiment.'¹

The word inhabitation implies full scale occupation. This scale is often employed in architectural design processes to make tectonic fragments to aid the perception of proposed space or details or as partial recreations for exhibition, that is, non-drawing practices. Another aspect of full scale regards the inhabitation of drawing in terms of the body's making and encountering drawing.

'Drawing the Room | Drawing within the Room' (2019–2020) couples projective drawings with *post factum* documentation – or creative post-occupancy data – of built houses by Pac Studio in Auckland, New Zealand.²

¹ Emmons 2014, p. 550.

² <https://www.pacstudio.nz/>

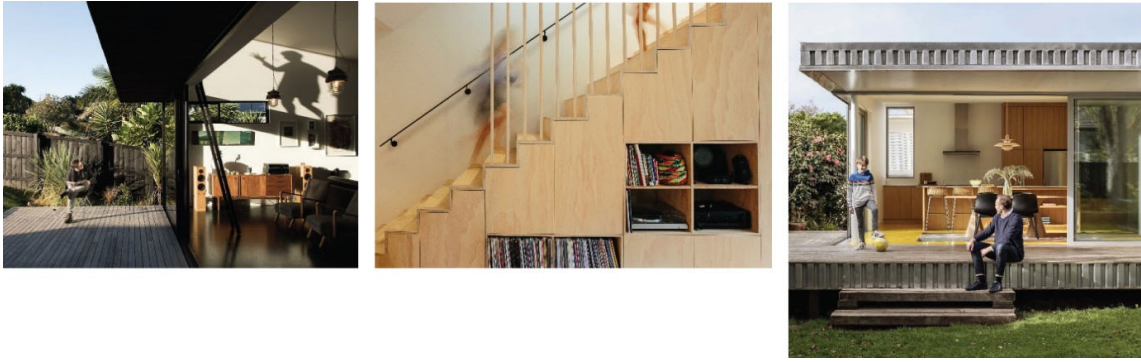


Figure 1: Pac Studio: Space Invader House (2015); Pop Up Gable House (2015); Yolk House (2018). Photography David Straight; Sarah Henderson; David Straight.

Using motion capture technology, the movements of inhabitation are captured and translated to line work animations. The resulting drawings of inhabitation are projected full scale, exhibited in the space of the architectural office, the site of conceiving and production of both drawings and architecture.

In this work, everyday actions, such as cooking and cleaning, were recorded using OptiTrack motion capture and three-dimensional tracking systems: 37 markers were attached to body suits; data was used from these sensors to triangulate the three-dimensional position of the body between six cameras, calibrated to provide overlapping projections. This data was then played as line work animations: each action-as-line was visible for 35 seconds before fading away. The digital model, created in BIM software Revit, was added – the projective drawings to ‘get to’ the houses – allowing additional viewing with virtual reality headsets.



Figure 2: Sarosh Mulla, Aaron Paterson and Marian Macken, ‘Drawing the Room | Drawing within the Room’ (2019–2020); motion capture, recording the acts of cooking and eating in Pop Up Gable House (2015) and Yolk House (2018). Photography: Aaron Paterson and Stephen Njoto.

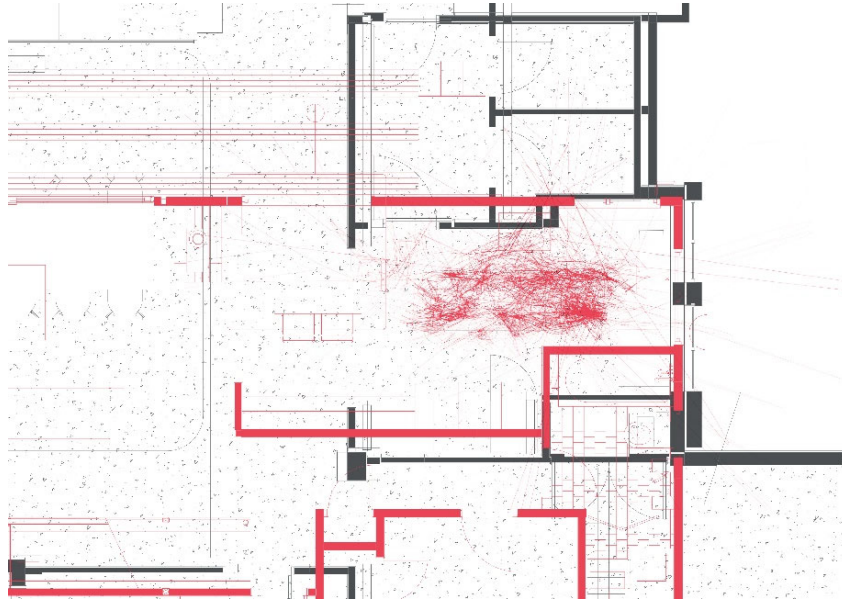


Figure 3: Sarosh Mulla, Aaron Paterson and Marian Macken, 'Drawing the Room | Drawing within the Room' (2019–2020); superimposed plans of Pac Studio office and Pop Up Gable House (2015), with the trace overlay of the inhabitant's movement, while making an omelette, as line work animation from motion capture. © Aaron Paterson, Sarosh Mulla, Marian Macken.

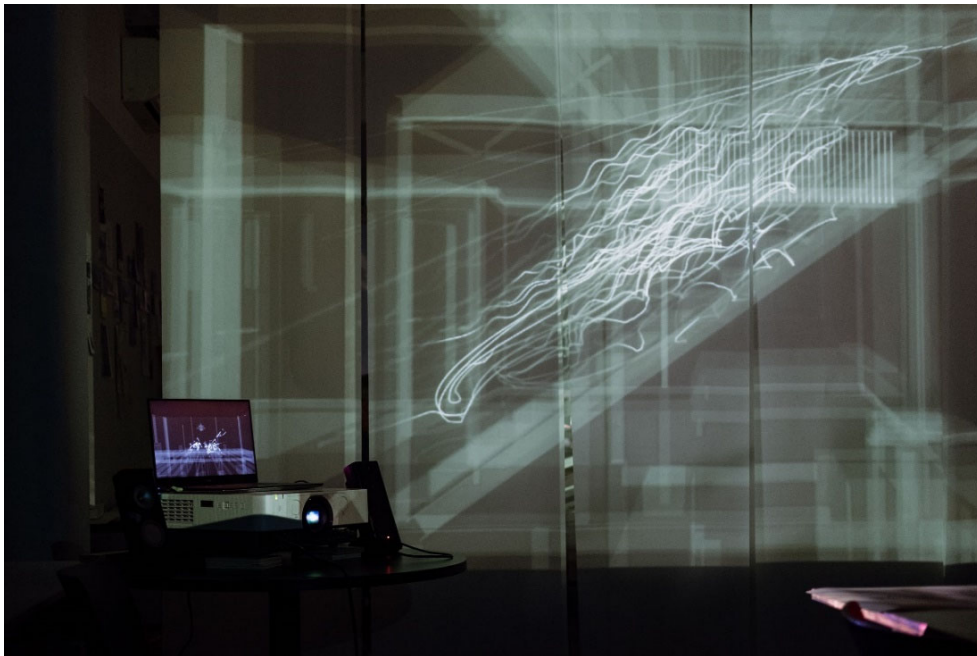


Figure 4: Sarosh Mulla, Aaron Paterson and Marian Macken, 'Drawing the Room | Drawing within the Room' (2019–2020); photograph of digital model of stair of Pop Up Gable House (2015) superimposed with the trace of the inhabitant's movement as line work animation from motion capture, while running upstairs, projected on internal wall of PAC Studio office; New Zealand Institute of Architects Festival of Architecture, Auckland, New Zealand. Photography: David St George.

Additional to the line work bodily traces, audio recordings were captured simultaneously: these offer atmospheric clues to the reading of the projected drawings and make explicit the temporal duration. This work was exhibited, projected full scale, in the space of the Pac Studio office.

Paul Carter writes, 'Our world is composed of the traces of movement but our representations conceal this. Our thinking is a movement of the mind, but our forms of thought are static.'³ Similarly, Greg Lynn describes the effects of this: 'An architecture of static bodies rejects all contiguous, contingent forces, leaving the flows between bodies unattended.'⁴ The performative drawing practice of motion capture focuses on these traces and marks made by bodies in space.

With the technique of motion capture, the body enters and makes the drawing: it is a trace of the body's movement within space. Rather than drawings having the presence of the human figure as a scale reference, in this technique it is the movement of bodies, grounded in the habits of the houses' inhabitants, which generate the drawings. Lois Weinthal writes that it is within the house that we first understand both the act of dwelling and 'an architectural scale that gives us a gauge by which we encounter all other architecture.'⁵ By recording this act of dwelling through motion capture, this scalar understanding is given a drawn manifestation.

Inhabitable drawings II: *Drawing Room: Edge of Shadow* (2020–2021)

'Drawing Room', exhibited at Toi Moroki Centre of Contemporary Art Christchurch (CoCA), New Zealand, included two components – a drawing apparatus ['Drawing Machine'] and virtual reality animation ['Edge of Shadow'] – which are inter-related in conception and site.

'Edge of Shadow' begins with a digital rendering of 'Drawing Machine'; its projected shadows are captured within a VR environment. In the animation, the room it occupies disintegrates; the apparatus itself is then doubled and mirrored. The plan grid of CoCA provides a framework for a new context and geometry as virtual space shifts and expands. The projected shadows are materialised, casting their own shadows. These shadows need planes and surfaces to fall on: a new peripheral edge catches them. As the virtual space shifts and expands, the sound environment evolves in parallel; vast new shapes turn and shift and the sound of their passing echoes outward, resonating with the familiar and the impossible, with music and distortion.

³ Carter, 2008, p. 5.

⁴ Lynn, 2001, p. 67–68.

⁵ Weinthal, 2006, p. 25.



Figure 5: Aaron Paterson, Sarosh Mulla, Marian Macken, 'Drawing Room: Edge of Shadow', Toi Moroki Centre of Contemporary Art Christchurch, New Zealand (2020–2021); VR projection. Photography: John Collie.

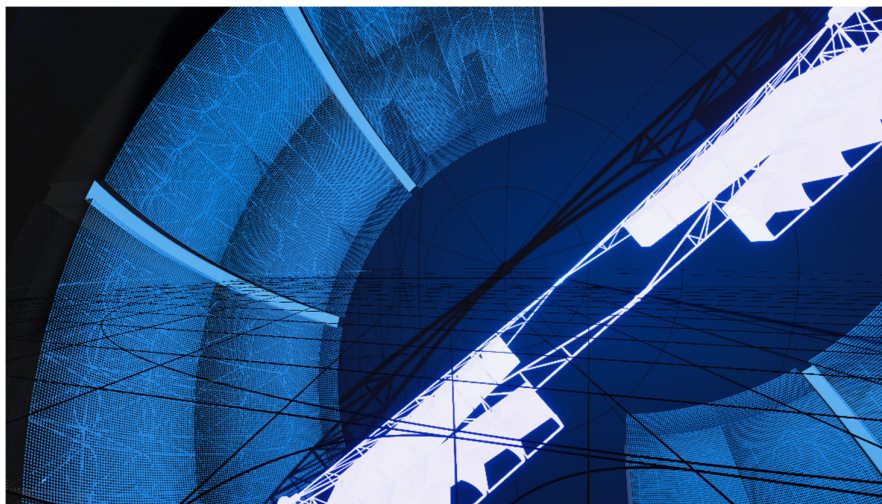


Figure 6: Aaron Paterson, Sarosh Mulla, Marian Macken, 'Drawing Room: Edge of Shadow', Toi Moroki Centre of Contemporary Art Christchurch, New Zealand (2020–2021); VR projection.

In architectural practice, virtual reality offers clients a point of view within proposed designs, to aid comprehension of the scale of these spaces. It models proposed built architecture as close to reality as possible, yet often inadequately simulates shadows and light quality.

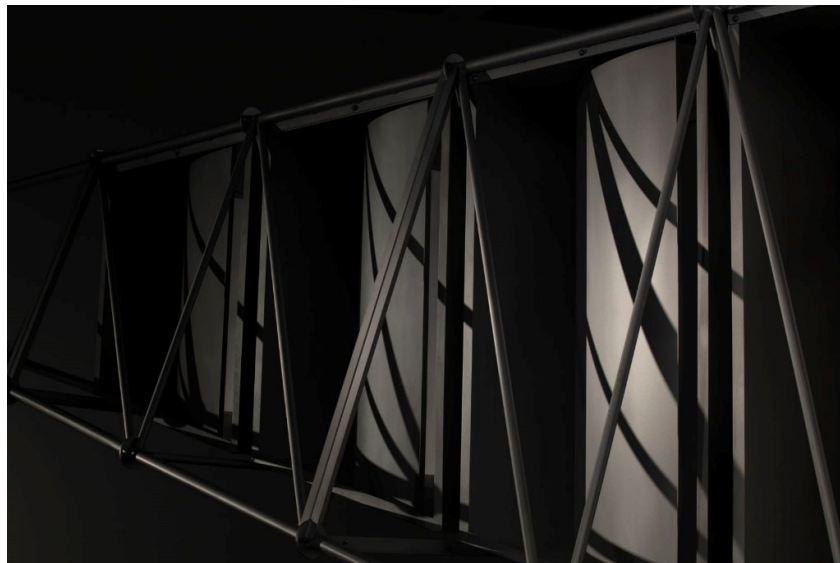
'Edge of Shadow' removes VR from its role as instructive simulation. Instead, it uses realistic rendering as a point of departure, towards forms that will never be built. Scale is maintained but it is immersed within a vastness of space. The real becomes an abstracted fiction yet

built upon concrete space. A new drawing is created, generated from the physical context of the gallery, but expanded beyond these bounds.

A fundamental difference of motion capture technology from photography is that the information gathered is not an image, but rather data. Since the data gathered is a collection of trajectories recorded in space, the viewer is able to manipulate their position within that space. In the virtual reality model, the viewer can in fact be within the lines, that is, be positioned where the drawer was positioned in creating the movement.

Drawings made with light: *Drawing Room: Drawing Machine* (2020–2021)

‘Drawing Machine’, exhibited alongside ‘Edge of Shadow’ at CoCA, explores drawing *in* space, rather than *of* spaces. ‘Drawing Machine’ is a drawing apparatus which offers techniques for drawing with light. In this space, an aluminium frame slowly arcs across the floor in an endless repetition. It passes through beams of light, generating shifting conditions for creating shadows. These shadows are designed, not accidental. A full scale drawing with light comes and goes: light and shadow are manipulated to create an occupiable volume. Accompanying this are algorithmically generated sounds, intensifying in parts of the room during its trajectory. Rather than this being the demonstration of a prior simulation, it is intended as a tethering point for future drawing, holding the place from which a VR sequence expands and returns.





Figures 7, 8, 9: Aaron Paterson, Sarosh Mulla, Marian Macken, 'Drawing Room: Drawing Machine', Toi Moroki Centre of Contemporary Art Christchurch, New Zealand (2020–2021); bead blasted aluminium frame, rubber tyres, electric motor and gearbox; 2.5 minute cycle. Photography: Simon Devitt.

For Pac Studio, architecture has the ability to draw with light and shadow: these may occur within buildings, on their outside surfaces, and on their surrounding ground. These changing conditions are temporal: cyclic yet ephemeral. The resulting architecture is in constant flux due to these changing conditions. Architect and educator Lynda Simmons, in her essay 'Interior Darkness/Contained Shadow'⁶, discusses the pleasure derived from shadows set against the exterior brightness connecting the inner realm and the illuminated plane beyond. Simmons's conclusion is that shadow contributes to a particular character of New Zealand architecture, one with a sense of interior intensity.

'Drawing Room: Drawing Machine' explores shadows cast by a moving object generating shifting conditions for creating shadows from stationary lights. In recent work of Pac Studio, techniques and strategies are used for drawing with light that moves. Crinkle Cut House (2022) was built around the spectacle of light and shadow. The raked clerestory windows and a dynamic facade of louvred doors supply a constantly changing atmosphere of light, shadow, and view of the pōhutukawa trees that surround the corner site. These windows also confer a temporal element – allowing occupants to follow the movement of the sun and moon throughout the home's spaces, and enjoy the way light and shadow plays across the interior's carefully crafted structural elements.

⁶ Simmons, 2011, p. 126–130.



Figure 10, 11: Pac Studio, Crinkle Cut House (2022); Waimataruru House (2022). Photography: Simon Devitt; Sam Hartnett.

Waimataruru House (2022) has an aesthetic of shadow and interior darkness accentuated by dark timber tones and earthy rendered plaster. The house cascades from east-west, following the natural fall of the site and arranged around landscape moments and alcoves of darkness. This darkness allows for subtle changes in light quality to be perceived across the course of a day. The effect is a stratum of interior darkness with rich views towards the light.

This continues a seam of speculation and production regarding drawing and light for Mulla, Paterson and Pac Studio: 'Penumbra Reflections' (2018), exhibited at Objectspace Gallery in Auckland, presents a stainless-steel mirror inside a 3.6 metre cubed aluminium skeletal frame within the gallery space. Moving projections, which are simulations of the frame and mirror from four projectors onto two of the gallery walls, are cast across the frame.



Figure 12: Sarosh Mulla and Aaron Paterson, 'Penumbra Reflections', Objectspace Auckland, NZ (2018).
Photography: David St George.

Scale & exhibition / Inhabitable architecture: *future work*

These research projects investigate full scale architectural drawing. Emmons writes that when 'no clear relation exists between body and drawing, this inhabitation is at best partial and shifting.'⁷ These projects demonstrate the making of architectural drawings and the encountering of them, as engaging the entire body: in encountering these, we occupy and inhabit the spaces of these drawings.

This is framed against a background of the rapidly changing ways in which architects draw and visualise their designs. Current fixations on simulation – such as photorealistic collages, BIM and virtual and augmented reality – require a reconciliation with practices that mediate through the idiosyncrasies of translation as the hinge between idea and built form.

'Encountering Drawing' explores the process of translation of speculative drawing studies and exhibitions (named *Shadow-past*) into professional architectural work in the form of architectural inner skins, apertures and surface studies for built forms (named *Future-built*). Pac Studio uses the analogy of cooking stock: these speculative, exhibited projects hold thinking and experience and provide crucial essences which can then be distributed, in smaller amounts, throughout future built projects.

The work explored in these inhabitable drawings, created by light and shadow, propose inhabitable architectures, in particular roof forms and apertures. Four houses across Aotearoa New Zealand, in design development at Pac Studio in 2022, continue to explore this integration of changing light conditions: Second Avenue and Rangitahi Houses both incorporate upper level windows which filter light and direct views; Sherwood Avenue House expresses the roof at the point of the window; and Greers Road House allows for shafts of light through to the interior. Four maquette models of 1:10 fragments of these houses are modelled and included in 'Encountering Drawing'. These 'corners' allow for viewing apertures onto the 'site' of past work – in the form of projections and screenprinted drawings.

⁷ Emmons, 2005, p. 233.

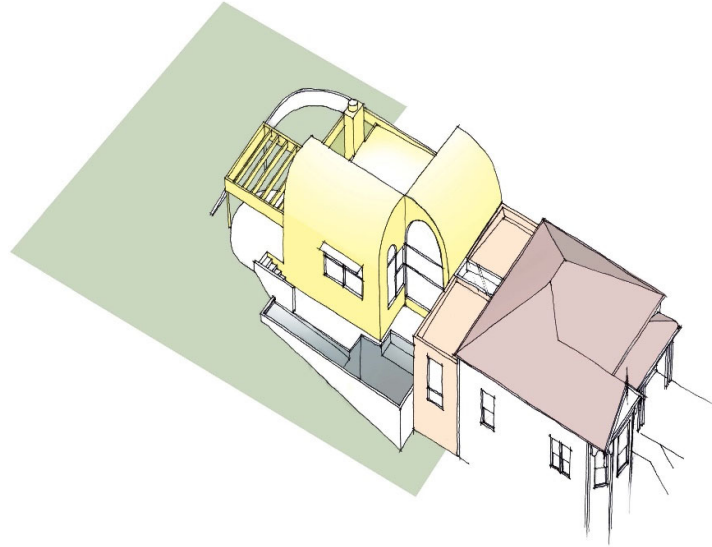


Figure 13: Pac Studio, Second Avenue House (2022), axonometric

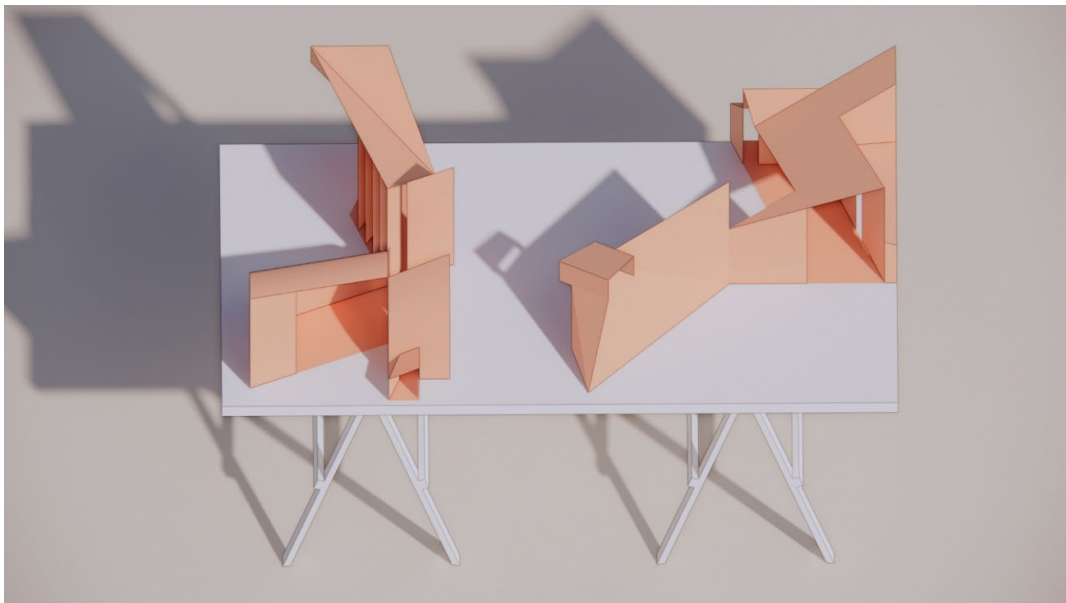


Figure 14: Sarosh Mulla, Aaron Paterson, Marian Macken, 'Encountering Drawing' exhibition detail

In this way, full scale drawing practices are translated into full scale built works: the exhibited work within 'Encountering Drawing' then is a mediator of scales. It offers work that is full scale, scale-less and to scale. The conceptual ground (of screenprints and projections) are read as full scale and scale-less documents of and from 'Drawing Room'; and the modelled apertures are read as both full scale artefacts for encountering the exhibition and as tests for future full scale built works.

Architectural drawings are acknowledged as instruments of ‘interpretive translation’⁸ —that is, they are able to produce another drawing, model, or building element—understood to occupy a different site. In this way, the speculative drawings that have been exhibited have an afterlife within the work of Pac Studio: the intention is that the Studio’s built work will be intertextual in that it will refer to remembered fragments of creative works and drawings that sit beside this work yet feed into it. Drawing then is seen as the site of labour of the maker, or drawer, *and* the site of the viewer, those that encounter it.

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⁸ Goffi, 2018, p. 326.