

INTRODUCTION

**Design Making –  
The Values Had, The Object Made,  
The Value Had –  
Practice · Making · Praxis**

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James Stevens

04–11

#design making

#makers

#value

#design praxis

#design research

## Design Making

This issue of *Cubic Journal* concerns *making*, and the value-structures connected to the premise, before and after execution. Fifteen authors and constituent research teams present their work in manifested design research here. In this work, physical, semi-physical, and transitionally physical embodiments of objects, spaces, and prototypical design conjectures are part and parcel of the researchers' progress. Embodiment neither preempts, nor follows their work, but is essentially the substance of research itself within these manuscripts. The editors collected this work as status-taking for a broad range of creative and scholarly enterprises in several regions of the world. European, Southeast Asian, and American authors in architectural and product design fields provide perspectives on making-centric design research, across manual, digital, post-digital, and post-consumer spectra of fabrication. But as an assemblage, these works are more than a catalogue. They prompt retrospective thought on the values held, and the value given, by these authors' conjectural experiments in material form.

In this issue's title, the word *value* pivots on a semiotic hinge between different uses of the word. *The values had*, including the plural, suggests *starting biases*,<sup>1</sup> research frameworks, and/or institutional foundations that underpin designers and researchers as both individuals and members of institutions, disciplines, or professions. As much as the authors are academics within a global disposition to create knowledge, their predispositions within their research and professional surroundings are, perhaps, what lead their work to this journal issue as *makers* rather than other types of researchers. With *the object made* in between, a second and decidedly material use of the word *value* implies that value itself *can be had*, grasped or made *objective* as well as an *object* after manifestation. This second usage is perhaps more familiar in the industrial, post-

industrial, to generally capitalist contexts of all design and research presented here: for what is expended, what positive impact, benefit, or amortisation is gained? What *value*?

Implicitly or explicitly, each text presented takes a standpoint on the second premise of value. Making research carries an inherent optimism common to all design research, emphasised in practices where material manifestation, as a time-stamp, test, or milestone, must occur for the work to move forward. The optimism lies in the bravery, ambition, or hubris to employ resources to manifest objects. These authors fix material, labour, and thought *in place* through manifestation, such that they cannot be used for other purposes. Without value gained through subsequent time, users, and research, these resources are lost. Therefore, each body of work presented here requires a measure of courage to assert that value *will be had* if the larger environment beyond the researcher tolerates this resource concentration and fixing. These authors conduct work that they believe to be valuable; they do so at their own considerable opportunity cost and risk given the unknown and untested territory of the material research within this issue. In concert with the authors' self-confidence, the writing that accompanies these objects is partially a negotiation of the first definition of values against the second definition of *value*: some constructions of *value* are only appreciable when motivating *values* are shared, reconciled, or debated. Texts giving access to studio environments, connecting research product texts and literature review contexts, or providing insight to the mindset that precedes making, reveal the value structures that differentiate and connect design research with other productive fields.

**David Schafer** of StudioMake and Rangsit University in Thailand, provides granular insight into haptic feedback criteria during and after a bespoke door hardware fabrication project. Photographs of Schafer's work, conducted in

the author's studio and with help from nearby fabricators, argue their own aesthetic value. Editors and readers can subjectively accept or reject this value, though viewing the brass, teak, and wax prototypes elicits broadly-appreciable gratification as imagery alone. In addition to these images, Schafer engages his colleagues in an intimate work discussion regarding his set of values-as-design-criteria. These criteria, which experience and professional interest drive and frame, relate to micro-experiences during spatial transitions and in fabrication. Concurring with Juhani Pallasmaa,<sup>2</sup> Schafer conceives of hands almost as a set of voices. Before fabrication, they discuss inter-scalar and cross-spatial uses for architectural components, converting architectural fragments like steel wide flange segments into a door pull as readily as they form raw material. After manifestation, hands communicate across the substance of doors themselves, seeking information through heat exchange, texture, and mechanical-operational response. With designers' value sets and starting biases, Schafer's research is immediately comprehensible within the discipline. Similar to Pallasmaa, Schafer articulates design values and constraints; values perhaps intuitively palpable, but insubstantively described in design discourse. Admittedly esoteric, some of these experience values benefit from Schafer's description as an experienced design voice as well as a researcher and maker. To demonstrate one possible range of the outcome's breadth, regarding *what design can do, and what can be made* through these rich haptic experiences, is a returnable value easily understood by designers and educators. As they communicate with sceptical clients, students, or stakeholders, the maker's resource-fixing through manifestation returns value, partially because the subtleties of the aesthetic experiences are so minute. As Schafer implies, *these objects must be touched to be proven*. Verbal discussion of such experiences is substantively idle. When the currency of

value is *evidence*, rather than *truth*, physical manifestation bridges value gaps by pulling a small number of material experiences out of the infinite field of possibilities. Schafer's values driving his work return to core of the design discipline, with attention to infinitesimal aspects of lived experience embodied and gratefully communicated in his discussion of bespoke fabrication praxis.

**Sara Codarin's** work at the boundary of technological application adds value at the frontiers of knowledge, within a subset of architectural practice such technology touches less readily. Her work with the Lawrence Technological University College of Architecture and Design applies site robotics and automation with 3D scanning technologies to cultural heritage preservation. Codarin's work adopts architectural preservationists' widely-held values regarding deteriorating, abandoned structures in Detroit's metropolitan area. Seeking new and innovative ways to repair and preserve this architecture, Codarin's work approaches the problem as a maker interested in innovative tools and expressive problem-solving. The predominating question of *how* to apply the technology and truly make it viable in this unusual scenario leads to Codarin's innovative toolpath generation algorithms and new robotic material deposition workflows upon a test bed generated from a 3D scan. Drawing on an intervention tradition including Sverre Fehn and Peter Zumthor, Codarin's experiences with drone-propeller-blown dust and time-damaged eccentric geometries demonstrate persistence in service of straightforward, easily appreciable value-sets: *if the technology works, the deterioration will stop*. Sites for conflicting values to meet, doubtless encountered at Fehn's Hedmark and Zumthor's Kolumba Museums, occur between choices of technologies and materials: her work, like many of her fellow architects', does not blend into the material or tectonic context of the test-site, but

interjects as a transitional statement. Woodward Avenue Presbyterian Church, which Codarin uses for testing, reflects craft and construction traditions different from the Kuka Kr6-arc robotic arm's diligent progress setting layers of aqueous clay into a stone masonry gap. The people who laid that original masonry, alive and present, would undoubtedly comprehend the dedication and problem-solving ambition driving Codarin's research as similar to their own space-making ambitions. Ten miles from the archive of industry and making in the Henry Ford Museum, Codarin's manuscript is a snapshot into twenty-first-century production, at the leading edge of technology where innovative workflows demonstrate value through application in new fields.

**Brian Lee's** research on design prototyping process directly argues for a value field in Hong Kong's social innovation industry context, which is suspicious of designers' abilities to add consensually-agreed worth. His writing, diagrams, and case study projects finely examine movement between mindsets and prototyping media to concretely answer the question, *what value is gained by making prototypes?*, particularly in projects where audiences are under-served and material risks to clients and publics are high. Lee explicitly expresses what many of the texts here imply: that designers add value to many innovation processes through their simple ability to make *thoughts into images, and images into objects*. His case studies at The Hong Kong Polytechnic University touch on urban infrastructure and aging populations: researchers refit an antique tram with transparent fairings to reveal its internal workings to users and passers-by. An elderly man uses a LEGO model to rearrange partitions and furniture in his apartment. Within these scenarios, doubt raised against designerly ways of thinking and working sits at every margin in the face of developmental inertia and safety-preoccupied constituencies. Prototype-making provides value by allowing

retrospective reflection upon negative fears and, even more difficult to describe in the absence of a tangible, physical prototype, *positive, imaginative possibilities*. The transparent-sided tram not only functioned *normally and safely*, it was also *beautiful and revelatory*. The elderly apartment residents' livelihood was undamaged by designers' participation, and they *discovered spatial autonomy, which they believed unattainable*. Lee's writing clarifies the structure behind the value physical making as prototyping can provide, allowing access to design thinking's complex and laterally-moving depths within the social innovation enterprise.

**Dr. Guan Lee and Daniel Widrig's** expressive modular design experiments privilege transgressive aesthetics and experimentation values, contrasting with normative tectonics through an algorithmic, digitally-driven vocabulary. Contemporary drawing and fabrication techniques allow modular and fractal geometries as holistic spatial expression systems, which Widrig and Lee explore through various media. Modules, for Lee and Widrig, act as the translational device to physicalise digital zoom-facility between the scale of the atom and the scale of the city. In a tradition of digital fabrication and design research, the authors embody an argument for modular aggregations collecting, like colonies of ants or termites, into constructions large enough to enclose bodies and human life. In the process, their preference for expressive geometry and novel aesthetics profoundly disturbs the hierarchy and tectonic separation underpinning normative construction: trabeation, frame and infill, and any structural rhythm as simplistic *bearing-span-bearing-span* can be discarded as aesthetic and organisational values underpinned by normative construction practices and their limitations. In their absence, fog-like fields of scalar and connective transitions underpinned by diffuse-but-ironclad logics take shape. The last of their digital collages project

futures where digital fabrication equipment scaling broadly disseminates such logic. Will a displacement of twenty-first-century construction economies, and their constituent value preferences for industrial standardisation and scaling, accompany this aesthetic change, as some twentieth-century architects and designers contended?<sup>3</sup> Lee and Widrig make no such claims, confining the value given by their mathematical and formal experiments primarily to making-internal concerns; modularity allows their researchers a method of clarity within variety and expressiveness. Modular assemblies scale up easily for researchers who erect their own work into overhead spans, unlike trabeated structures which may require additional manpower or equipment. For them, modularity enables their radical aesthetics, and these radical aesthetics enable spatial discovery as its own revelatory condition.

**Philippe Casens** and **Nathalie Bruyère** offer a retrospective on their work at the Institut Supérieur des arts de Toulouse, soon to be published in a larger manuscript. Their consumer and user engagement work is founded in the *Global Tools* post-Marxist philosophy and socio-economic theory. Perhaps the text most explicitly dealing with value constructs outside of design, Bruyère and Casens' article discusses post-consumerist economic and social structures related to co-production tools and workshops. Bruyère's research collaboration *Ultra Ordinaire* designed image conversion software, allowing consumers at Bonnefoy Social Center to convert their personal imagery into embroidery artefacts. Among other manuscripts here, their work connects *tool use* and *tool making* to the radical project of craft: to undermine, disturb, or provide alternatives to consumerist and industrialised *making patterns* and *parallel lifestyle patterns*. *The commons* and *commoning*<sup>4</sup> structures in their writing connect object making to object and intellectual property ownership, and the constituent values internet connectivity and digital fabrication both

destabilised. Their writing suggests that peoples' values and objects they make are less cause and effect, and more chicken and the egg: *could a change in the way we jointly make things create a change in the way we live together?* The text Casens and Bruyère present in this issue provides the post-industrial, post-Marxist intellectual setting for the larger monograph due for forthcoming publication, a setting shared by a number of texts in this volume's investigation of innovative production initiatives.

In Sichuan Province, the People's Republic of China (PRC), **Kuo Sze Yi** and his partners' research *chuan dou* wooden framing and other carpentry techniques in changing rural contexts. Kuo's work progresses the carpentry vocabulary to new manifestations of communal development action, both in professional and student workshop projects. Their making depends upon craft traditions adapted over time to demographic and geographic change as villagers move house, recover from earthquakes, and negotiate the PRC's changing economic structure. Ritual and symbolic values of the *chuan dou* system reflect complex relationships among the villagers, and among villages. Against this richness, Kuo works to help villagers cope with *hollowing out*: the aging and displacement of villages' able-bodied population groups as younger generations leave for work in Chengdu and other nearby cities. Small gestures, simultaneously novel and antique, such as village wayfinding projects and adaptable outdoor gathering pavilions, suggest new purposes and new everyday experiences for villagers whose place in society has changed. The design research here combines formal pursuit of new vocabulary, and humanistic re-assertion of experiential values, in environments where neither old nor new praxis can predict the future. Kuo's work demonstrates a pragmatic inventiveness interested in returning concrete value through available means, concretely sympathetic to the carpenters and villagers with whom he works.

The lead editor's own work in a village context near Hong Kong deals with *construction technology improvement*, a betterment construct driven by seemingly consensual values, but in fact fraught with power imbalances, unsuitable practices, and implementation failure. John F.C. Turner and his colleagues' extensive research provides a foundation for Elkin's technical research implementation methodology, testing *tooling provision* within construction technology networks. The value added by the metalworking tooling concerned – an improved *pressure forming* setup for doubly-curved shell production – seeks an implementation niche within small to medium enterprise contractors' complex constraints. Elkin argues that aspects of the construction technology network members' fabrication practices partially explain the failures of industrial technology implementation within housing and autonomous development markets. Industry and technology research, pushed forward at the *state of the art*, struggle for a firm footing in development markets that do not operate at the state of the art, *and may be harmed in their basic operation if forced to do so*, oftentimes through resource concentration and authority centralisation. Elkin attests that within this framework the values driving new technology development are arguably different from industrial optimisation practices. Furthermore, *maker researchers* may be uniquely equipped to develop that technology. From examination of his own work, Elkin hypothesizes construction technology improvement that uses the maker-researchers' unique knowledge subsets to disentangle new construction technology implementation.

Working closer to the state of the art, **James Stevens'** manuscript frames the future for post-humanist making and fabrication, an increasingly relevant body of practice in the future of a Fourth Industrial Revolution. Stevens' gently projective and encouraging text suggests that within the coming artificial intelligence (AI) enabled

production contexts, craft and the maker as the *liberal subject* of fabrication polemics is likely to have a more complex future than the dire predictions of some postmodern criticism. Stevens works with his *MakeLab* colleagues to develop a material deposition workflow allowing intimate, co-robotic interfaces between computer-numerical controllers and a craftsman, developing a series of posthuman maker objects. Through 3D scanning and analysis, Stevens' projects a method to develop AI fabrication workflows extending the agency and reach of the posthuman fabricator, propagating his, her, or its material intelligence to greater lengths. Stevens' literature review questions values as deep as the definition of humanity within its ecosystem and productive culture. He adopts Katherine Hayles' contention that posthuman ontology will likely animate the human person with new priorities and potentials. With humanist values such as humanity's supremacy and uniqueness suspended, what inter-humanistic objects and ecologies may emerge? Stevens humbly offers a window into this posthuman future, in which *Homo sapiens* and other actors' blended intelligences and values assemble entirely new premises for object-making. In the immediate term, his progressive tool-making research manifests a stimulating series of artefacts and workflows, fully animating the present while projecting the future.

Strongly rooted in present-day practice, **Eddie Chan** offers a pedagogical framework for object-making in the Hong Kong Design Institute's (HKDI's) Department of Architecture, Interior, and Product Design. Chan deals broadly with preconceptions and misconceptions of a changing design education market in Hong Kong and South China. Where drawing production factories and digital renderings predominate students' early professional experiences and expectations, where does design pedagogy insisting on physical manifestation, modelling, and exploration fit? Many professionals share Chan's experience in

the rapid development economy throughout South China and the Greater Bay Region: development, and by extension, design production cycles, that are hyper-dense and hyper-fast. Chan argues the layered value that making gives to students through a number of public installation projects, and demonstrates through students' learning experiences and professional growth the value they can gain by extending themselves into increasingly uncommon design education territory. Chan presents his students' work as design experiments with accompanying hypotheses, testing, and feedback. Students' scale-naïve assumptions about digital fabrication and rendering's capabilities, prefabrication limitations, and the reality of atmospheric effect become real to them as making-centric pedagogy affords them a true testing ground. Value is returned in these students' abilities to closely comprehend some of the most essential components of spatial competency, ironically only partially rendered by spatial design disciplines' primary representation media.

*Arch 002* emerges from the post-consumer processing research which **Elise DeChard** and **Fernando Bales** conducted in their fabrication facilities. Their work repurposing polyethylene drainage piping into concrete formwork subverts tacitly-included values of *single purpose* embraced throughout Home Depot home improvement outlets and their supply chains. Bales and DeChard's work, compared to Antoni Gaudí's catenary model making illustrates one line of progression in the construction industry, from a semi-primordial condition of forces, material, and discovery to a late-stage capitalist society with corporate production as mediator. In this setting which potentially fosters banality, DeChard and Bales borrow Kennedy & Violich Architecture's *material misuse* premise to develop a series of expressive spatial possibilities, encountered by crossing between catalogue aisles in home improvement stores. This cross-pollination is

latent in the experience of nearly every home-builder or home-owner in North America, but not fully appreciated without the transgressive value sets driving formal and structural provocation through *Arch 002*. Accepting their mediated position, Bales and DeChard work to re-process and re-see the formal and spatial value given through transgressive reuse, to develop an expressive formal and spatial vocabulary.

Lastly this issue offers **Daniel Echeverri's** ongoing dissertation work on hybrid digital/physical narrative construction. These semi-embodied experiments explore discursive possibilities between storyteller and listener afforded by emergent digital technology. Echeverri's work remains tactile, exploring boundaries between older manifestation media for narrative, and the new frontiers of experience, thus encompassing objects and experiences that have otherwise never *physically* existed. Perhaps fittingly, this last manuscript stands firmly with one foot in a current bodily experience understanding, and the other in fully-binary experiences soon to become commonplace. As an exercise elemental to experience, Echeverri's storytelling returns to this Cubic Journal issue to the topics prompting us to question the value and values after and before making. The objects and experiences we make are part of us, as humans, post-humans, or trans-humans. As such, they speak to our core concerns and our ongoing exercise of understanding our experience. From the universal to the particular, artefacts generating knowledge, or *objets de art* serving *peculiar* times, places, and needs, these objects made, the values had, and the value had, reflect the ongoing narratives of making as research and societal enterprise.

## Notes

1. Philip Plowright uses the term “starting bias” to describe designers’ and architects’ pre-conditional experience, moral, and ethno-cultural preferences distinct from their design work briefs. Refer to: Plowright, Philip D. *Revealing Architectural Design: Methods, Frameworks & Tools*. New York: Routledge, 2014.
2. The specific Pallasmaa text Schafer, and other authors in this issue, refer to is: Pallasmaa, Juhani. *The Eyes of the Skin: Architecture and the Senses*. Chichester, UK: Wiley, 2014.
3. Perhaps the strongest claims made related to novel spatial and construction aesthetics came via deconstructivist linguistic theory applied to architecture. Jacques Derrida correlated social and semiotic destabilisation to new architectural form-making by Peter Eisenmann and other authors, connections which have recently borne intense critical scrutiny. Refer to: Derrida, Jacques, Joana Masó, and Cosmin Popovici-Toma. *Les Arts De L'espace: Écrits Et Interventions Sur L'architecture*. Paris: Éditions De La Différence, 2015.
4. Editors and authors similarly addressed commoning and the creative commons in *Cubic issue #1 vol. 1 – Design Social, Technology – Activism – Anti-Social*. As participants in material culture, design-researchers’ work necessarily crosses between physical manifestation and its consequences, such that while this issue concerns Making, its content transacts with the previous issue’s concern with the Social. Refer to: *Cubic Journal Issue #1 Vol. 1 - Design Social. Technology - Activism - Anti-Social*, no. 1 (2018). doi: <http://10.31182/cubic>.

## Bio

**Daniel Elkin** is a designer and builder working in Hong Kong. Elkin is an assistant professor of Environmental Design and Technical Coordinator for the Department of Environment and Interior Design at The Hong Kong Polytechnic University. His work focuses on spatial agency and its relationships with material practice, tooling, and construction technology. His work has been published in the journal *Architectural Research Quarterly*, at the College Art Association Annual Conference, and in a number of popular publications. His recent research studies stilt house communities in Hong Kong and Southeast Asia, studying intersections between community development, individual development decisions, and owner-builder construction technology. He has masters of architecture degrees from Cranbrook Academy of Art, and the University of Cincinnati.

**James Stevens** is an associate professor and Chair of the Department of Architecture at Lawrence Technological University, where he is the founding director of makeLab, the University’s digital fabrication lab. James is coauthor of the book *Digital Vernacular, Architectural Principles, Tools and Processes* (Routledge 2015). He is a licensed architect in the State of Michigan, USA and certified by the National Council of Architecture Registration Boards (NCARB). He is the recipient of the AIA Henry Adams Medal for Excellence in the Study of Architecture and was the 2016 Fulbright Scholar in Albania. He holds a master of architecture degree from North Carolina State University and a bachelor in fine arts degree from The Savannah College of Art and Design. He is currently a PhD candidate at the University of Ferrara, Italy at the Polis University campus in Tirana, Albania where his research focuses on digital fabrication and digital craft.