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Extended Directions in Design Research

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Editorial: Extended Directions in Design Research

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Abstract: The open track welcomes design research that explores distinctive directions beyond the conference's thematic streams, thereby enriching the scholarly discourse with diverse perspectives. The selected papers are divided into four sessions. The first session, Relational and Situated Design Practice, foregrounds embodiment, exchange, co-exploration, ritual performance, feminist critique, and cultural remembrance. The second session, Material, Mind and Machine, investigates the entanglements among physical matter, human cognition, and computational processes, challenging the separation among the object, the mind, and the machine that mediates them. The third session, Strategic Design Practices for Learning, Attention, and Co-Creation, discusses strategic design, together with means of engaging with complex problems in contemporary organizations and across different fields, and the fourth session, Human Experience in Product and Interface Design, brings together empirical studies across product design, interface and interaction design and studies that deal with customer reaction to advertising strategies and customer decision-making journeys.

Keywords: relational design, situated design, materiality, human cognition, strategic design, product interface, human experience.

1. Introduction

The open track welcomes design research that explores distinctive directions beyond the conference's thematic streams, thereby enriching the scholarly discourse with diverse perspectives. With a total number of 22 papers, the track is divided into four sessions. The first session, Relational and Situated Design Practice, foregrounds embodiment, exchange, co-exploration, ritual performance, feminist critique, and cultural remembrance. The second session, Material, Mind and Machine, investigates the entanglements among physical matter, human cognition, and computational processes, challenging the separation among the object, the mind, and the machine that mediates them. The third session, Strategic Design Practices for Learning, Attention, and Co-Creation, investigates meaning-making and strategic decision-making in organisational practices, accounting for the unique



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contemporary complexities. The fourth session, Human Experience in Product and Interface Design, presents empirical studies that span product design, interface and interaction design, and work that aims to shed light on the effects of multi-modal and sensory advertising strategies and unpack customer decision-making journeys.

2. Session A - Relational and Situated Design Practices

The papers presented in this session foreground relational embodiment, exchange, co-exploration, ritual performance, feminist critique, and cultural remembrance as situated practices, based on cases from Central and South America, Oceania, Europe and Asia. The relations between artefacts and the body are central in the paper *Relational Embodiment: Rethinking Artifacts as Mediators of Being-with-others* by Yufei Zeng and Junjie Zhang, who explore how embodied design generates relations among the body, artefacts, and society. Based on a literature review, the paper reveals that embodied interaction is shifting from functional control toward relational generation, presenting four tendencies: micro-intimacy, ambient co-presence, culturally embedded bodily rituals, and slow relational rhythms. It then suggests a relational framework to explain how embodied mediation operates across individual, social, and cultural contexts. With a similar focus, Thais Alvarenga and Michael Nitsche expand the methodology of body mapping in the paper *Reciprocal Sensing: Expanding Body Mapping through Lenca and Mestizo Ontologies of Relational Embodiment* to account for pluriversal ways of knowing through exchange with materials, environments, and the more-than-human world. Based on self-ethnography, the authors engage with three artefacts made by indigenous groups in Honduras and El Salvador, and map the relationships that emerged between the human actors and the materials, providing visual evidence of how the body's sensing emerges through exchange, reciprocity, and mutual awareness. In *Disrupting and Reimagining Women's Identities: A Feminist Design Methodology Inspired by the Self-combing Women's 'Goddess Fctual' Practice* by Lu Lia, Catherine Caudwell, and Rosie Scotta, the authors translate resistance to patriarchal marriage identities in late-nineteenth-century China into a contemporary design methodology. The paper situates women's ritual performances within lived goddess fictions—materialised through shrines and props—and proposes a four-stage feminist design framework, *Design Goddess Fictual*, which adapts the practice into a methodology for constructing feminist identity. A feminist perspective is also at the core of the paper *Data and Power: A Tool for Designing Data Visualisations from a Feminist Perspective* by Bianca Novais Queiroza and Virginia Tiradentes Souto, which proposes a critical, analytical and methodological set of principles to assist information designers in transcending normative biases in their work, challenge conversations, and create more inclusive and socially committed data narratives. To empirically validate these principles, the authors applied them to data visualisations in Brazilian, France and Mexican newspapers, which provided information on the presence of women in institutional politics. In *Urban Typography and Cultural Memory: A Literature Review in Support of a Design-led Approach to Heritage and Preservation* by Carolina Short and Gareth Schott, the typographical urban surface, including letterforms found in architecture, desktop publications, websites and digital interfaces, is approached as a palimpsest of graphic expression manifesting how “the city remembers itself”. Through a design-led inquiry in Aotearoa New Zealand, the paper examines how to support the documentation, reinterpretation, and revitalisation of those letterforms, approaching them

as public expressions of cultural heritage. Tavs Jorgensen, James Burch, Nina Shoulder, and Antonietta Amato tell the story of the design and construction of an experimental pavilion in England in their paper COB CLUB: Co-exploratory earth building experiments, foolish in technique and form. The authors describe how researchers, facilitators, students, makers, and materials are participating in an unstructured, fragmented process through a series of exchanges and semi-controlled co-exploration, promoting foolishness and play and highlighting the creative benefits of unmanaged collaborative spaces enabled by design research.

3. Session B - Material, Mind, and Machine

The second session of this track brings together six papers that investigate the entanglements among physical matter, human cognition, and computational processes, challenging the separation among the object, the mind, and the machine that mediates them.

The first two papers interrogate the creative practice. Oliver Bates, Ben Kirman, Marcia Tavares Smith, and Davide Philip Green make the case for Research through Game Design, arguing that designing games is itself a generative research method. Through the analysis of four games, they invite us to treat the game design process as a site of knowledge production that needs to be captured and communicated. Martin Disley and Murad Khan discuss a specific challenge for creative practice, design fixation, and how it can be exacerbated by human-AI creative collaboration. In their paper, Unlearning to Rest: Machine Unlearning as a Method of Mitigating Design Fixation in Human-AI Creative Collaboration, they propose to use machine unlearning to selectively remove concepts from a language model, forcing designers to rethink a design problem from scratch, highlighting how the absence of a concept can be particularly generative during ideation. The relation between AI tools and imagination is also explored by Chinmay Pade in their paper “Why Do All the Schools Look the Same?” Exploring Children’s Spatial Design Preferences through Generative AI in India. The author presents a case study of primary school children in India adopting AI in participatory workshops with the aim of imagining their ideal school. They analyse the emerging tensions of AI as a tool that supports instant visualisations, and so the ideation process, but at the same time flattens the pupils’ imagination by proposing globalised aesthetics that override local knowledge and cultural identity. The paper suggests the need for critical engagement in participatory spatial design through generative visualisations, highlighting how algorithms mediate creativity and the cultural imagination of space.

A couple of papers in this session explore in particular the understanding of the human-artefact relationship. Stefano Caggiano, in their paper titled Meaning at a Distance: Redefining Aesthetics in the Age of Intelligent Objects, argues that as objects become intelligent by embedding AI, the understanding of affordance needs to broaden. The paper introduces the concept of aesthetic affordance, referring to the designed capacity of an object’s form to make its internal states and behaviours legible without demanding active attention.

On the other end, Xiaoshan Wang offers a systematic account of “physicality” in human-artefact interaction, deriving five core attributes from an evolutionary analysis of the

concept. Material substantiality, perceptibility, two-way interaction, embodied correlation, and affordance are attributes presented within a structured framework that support a better understanding of physicality for exploration and application in interaction design.

In *Tectonic Computation: Crafting Logic through Material and Geometry*, Dimitris Papanikolaou discusses computation not as a digital phenomenon but as a physical and architectural one. Through pedagogical experiments in mechanical computing, enacting logic through material, geometry, and environmental energy, the author proposes that architecture is inherently computational, while also positioning computation as an architectural inquiry.

4. Session C - Strategic Design Practices for Learning, Attention, and Co-Creation

The four papers in this session all make theoretical contributions across strategic design, systemic change, and how co-design is understood and operationalised across different domains. Three papers engage with strategic design from different angles. In *Linking an Attention-Based View of the Firm and Critical Design in Strategising: Attention to Harmful Consequences*, Pääkkönen and Miettinen connect the attention-based view of a firm with critical and speculative design to examine how organisational attention is allocated and what is neglected in strategy-making. The paper argues that firm-centric strategic decisions frequently produce harmful consequences for end users. Drawing on examples of digital exclusion and sociotechnical harm, the authors propose four speculative "games" representing different strategic orientations: the traditional management game, the instrumental digital game, the risky business model game, and the purpose transformation game. These frameworks invite designers and managers to surface assumptions, question prevailing priorities, and redirect attention toward neglected user situations. The authors position design as an attention-shaping, communicative activity capable of fostering emotional engagement and ethical reflection in strategy-making, ultimately advocating for more socially responsible organisational decision-making that centres citizen wellbeing over profit. In *Strategic Design as Learning Infrastructure*, Prashant Matta argues that strategic design functions as a structural learning system in early-stage organisations, not only a product development tool. Drawing on two consulting engagements with technology startups, the study uses qualitative, practice-based analysis to identify four interdependent mechanisms through which design enables organisational learning: sensemaking (externalising ambiguity through artefacts), coordination (aligning teams across disciplines), reflection (questioning assumptions iteratively), and decision-making (translating insights into action). Together, these form a cyclical learning infrastructure that connects short-term experimentation with longer-term strategic direction. The paper concludes that embedding design into everyday organisational routines builds adaptability and resilience under uncertainty. Applying an even wider lens to how contemporary organisations function in their decision-making processes, Kees Dorst, in *The Studio model - creating space for continuous change*, discusses problem-solving in complex systems and argues that contemporary organisations must move beyond conventional problem-solving toward a design-based approach capable of driving continuous, systemic change. This is because today's challenges are too open, complex, dynamic, and networked for linear problem-

solving or one-off innovation projects. Drawing on the meta-practices of leading creative directors in art, design, and architecture, Dorst proposes the Studio Model — four interdependent spaces: the Lab (experimentation and reframing), the Academy (learning within and beyond the organisation), the Podium (open public dialogue on a structured rhythm), and the Temple (personal and organisational growth and reflection). Together, these create infrastructure for continuous innovation rather than isolated projects. A case study of Amsterdam New-West, where social design projects addressed neighbourhood cleanliness and public space, illustrates how bottom-up citizen initiatives and top-down municipal systems can be brought into productive, sustained dialogue. The paper calls for deeper empirical research into the largely unexplored meta-practices of creative leaders. The final paper in this session, Inter-Poly-Creation (IPC): Unifying Mass Customisation and Co-Creation by Chan, Parker and Southee, identifies a terminology issue across design, business, and marketing - where terms such as co-creation, co-design, and mass customisation are used interchangeably despite each term having distinct meanings. Through a scoping review of 828 academic papers, the study uncovers that each discipline values stakeholder participation differently - a fragmentation that limits innovation and cross-disciplinary collaboration. To resolve this, the authors propose Inter-Poly-Creation, a unifying framework that treats stakeholder participation as a flexible continuum of collaboration spanning creative, operational, and strategic dimensions.

5. Session D - Human Experience in Product and Interface Design

This session brings together six papers that move from dealing with product design, interaction and interface design, advertising methods and purchasing intentions and attitudes based on cases from Taiwan and China. In a contribution to product design, Strategic Thermal Design for Smartphones: An Experimental Analysis of Zonal Heat Perception across Hand Contact Regions, Zeng, Xiao and Wang examine how smartphone users experience heating in the device through a user study with 30 participants. The study presents empirical findings on thermal zoning and provides a set of design recommendations for how components with high heat output should be placed within smartphones. Dealing with interface design, Designing Motion Identity: Exploring the Aesthetic Expression of Brand Style through System Motion, by Xie, Guo & Chen, investigates how system animations shape aesthetic experience and communicate brand style by comparing three different operating systems. Twelve motion samples across four functional categories were coded for temporal, spatial, and transformational attributes, then rated by 48 participants using six descriptors. The paper argues that motion functions as a medium for how brands can differentiate their products. Two papers deal with interaction design techniques. Can the Thumb Point Effectively in VR? An Evaluation of Different 3D Pointing Techniques, Wei et al. investigate micro-gestures in VR, focusing specifically on the thumb. Based on two experiments with 26 participants comparing the index finger with the thumb for pointing. The study finds that the thumb is a viable VR pointing tool, especially for fatigue-sensitive scenarios, but the index finger remains the better default for tasks that require speed. Neither yet matches a physical controller. On the other hand, He, Leng & Huang, in Design Considerations for Effective In-Vehicle Interaction, examine how to design interactions for safer driving, looking at icons in vehicle interfaces. The study shows that concrete icons consistently produced faster reactions, higher matching accuracy, and greater cognitive

fluency than abstract ones. The paper provides design recommendations for personalised visual interfaces in vehicles, which would promote safer driving. Finally, two papers aim to understand customer decision-making processes and product evaluation. The paper *When Can ASMR Sound Improve Consumer Product Evaluation? Exploring the Joint Influences of ASMR Sound and Visual Richness* by Chen and Cheng investigated how in Autonomous Sensory Meridian Response (ASMR) sound and visuals jointly affect consumer product evaluation across three experiments with a total of 630 participants. The study demonstrates that ASMR generally enhances immersive experience and contributes to people's intention to purchase products, yet its effectiveness depends on visual complexity and adding too much detail can lead to cognitive overload. Lastly, in *Understanding the Electric Vehicle Purchase Decision through the Lens of Experience*, Chang and Tang reinterpret the Engel-Kollat-Blackwell (EKB) model (a 5-stage framework detailing the consumer decision-making process: need recognition, information search, alternative evaluation, purchase, and post-purchase evaluation) through an experiential lens, examining how Taiwanese electric vehicle buyers navigate their purchase decision-making journeys. Using semi-structured interviews with 11 participants, the study finds that experience plays a distinct role at each of the five decision stages and proposes expanding the EKB model by adding personal beliefs as a long-term internal trigger, and highlighting how third-party referrals can bypass entire decision stages.

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