Implicated Architecture: Extending Responsibility in the Automated Environment

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Artificial Intelligence
Ethics in Design
Ritualisation
Technological Constraints
Water

Contemporary architecture exists at the intersection of material form, societal influence, and systemic forces, yet it is frequently evaluated as a collection of discrete objects, celebrated for formal innovation, visibility, or prestige. This emphasis on the isolated object creates a structural gap between the act of production and the cultural, environmental, and temporal conditions it engages with. Within this framework, the architect is positioned as a singular author, a designation granting professional authority while allowing recognition to operate independently of responsibility.

Architectural production unfolds within interdependent networks, where outcomes emerge jointly rather than from a singular intent. The growing integration of artificial intelligence and robotics further complicates this landscape, mediating design and construction in ways that challenge conventional accountability. As these systems operate as active participants, locating responsibility within existing professional models becomes difficult.

This paper approaches architecture as a system of distributed responsibility, with the architect as an implicated subject embedded in broader networks of influence. Drawing on Michael Rothberg's concept of implication, responsibility is reframed as a

forward-looking and a collective condition extending beyond individual intent.[1] By examining how architectural outcomes emerge through interactions between human and non-human actors, this research proposes a framework for rethinking practice in an era of automation, moving beyond object-centered evaluation toward understanding architecture as a symbiotic and relational medium.

Detached Authorship and the Production of Prestige: Modern architecture has long positioned the architect as a figure of singular agency, credited as the sole author of the built environment. This designation drives professional focus toward prestige and recognition, which

depend on visible, notable output rather than the broader impacts the work produces. As Kengo Kuma observes, "architecture often prioritizes visual recognition, producing iconic objects rather than mediating lived experience and environmental outcomes".[2]

By centering the individual as the source of a project's success, the profession reinforces a system in which architecture is primarily evaluated as an isolated design object. Within this framework, recognition is granted for the formal qualities of the object itself, rather than for how the work engages with the ecological, social, and material contexts it inhabits. Acclaim for these objects then further reinforces this mode of evaluation, rewarding architecture that performs well as a recognizable artifact while sidelining the broader consequences of its production. In doing so, recognition validates the methods of the project while obscuring its wider impacts, allowing architects to advance their careers without fully engaging with the broader implications of their work.

Liquid Modernity and the Collapse of the Promethean: This disjunction between recognition and responsibility reflects a broader transformation in the social conditions under which architecture is produced. In Liquid Modernity, Zygmunt Bauman describes a shift from the "solid modernity", a mid-twentieth-century condition structured by stable institutions and long-term commitments that sought permanence, to "liquid modernity", our contemporary condition of constant flux in which structures such as jobs, relationships, and identities are no longer fixed but remain continually reformulated. This social transition has fundamentally altered architectural practice. As Bauman notes, "to 'be modern' means to modernize… forever 'becoming', avoiding completion, staying undefined", reflecting the constant flux and instability of contemporary society.[3] For architects, this condition of perpetual reforming dissolves the Promethean vocation, the ideal of the lone visionary architect shaping society.[4] Consequently, architecture, once understood as a social

1. Kengo Kuma, Anti-Object: The Dissolution and Transformation of Architecture (Tokyo: Kodansha International, 2011).

2. Zygmunt Bauman, Liquid Modernity (Cambridge: Polity Press, 2000), 2.

3. Carlo Ratti and Matthew Claudel, Open Source Architecture (London: Thames & Hudson, 2015), 12.

4. Bauman, Liquid Modernity, 138.

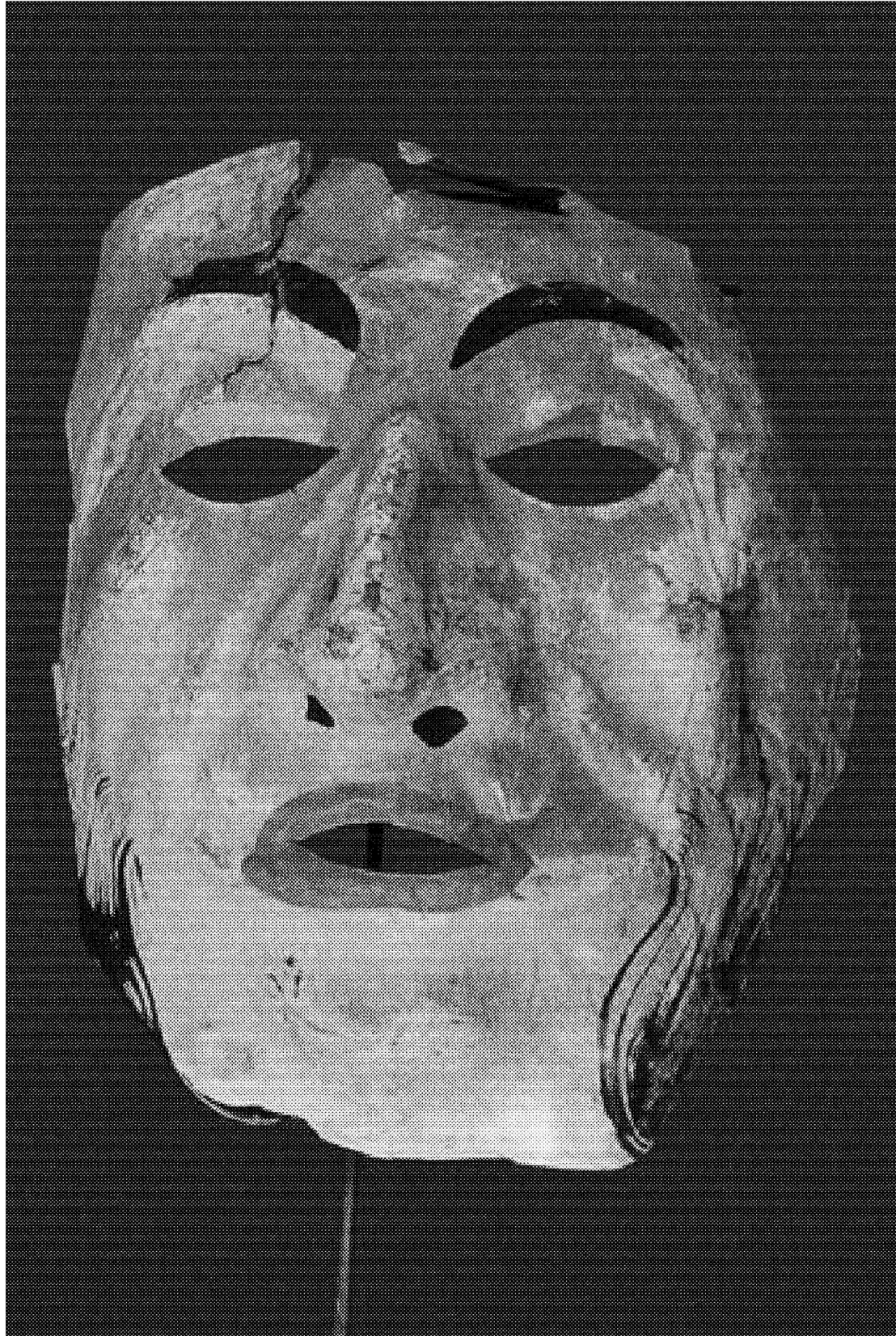
contract for building society, is now expected to gratify immediate demands of visibility, novelty, and career progression rather than achieve enduring social value.

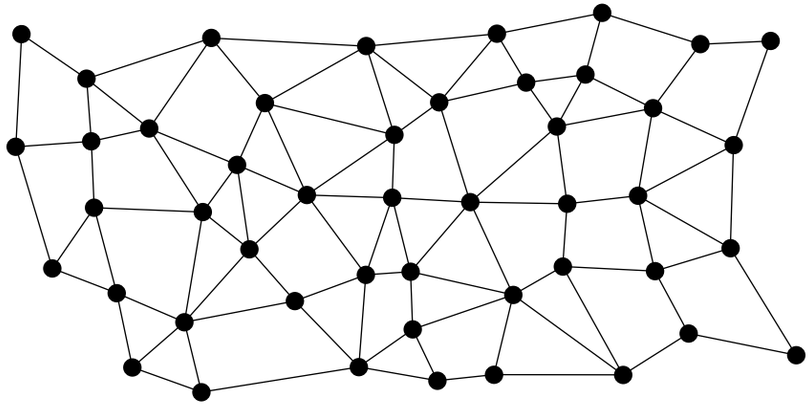
This change creates a crisis of accountability. Architects operate within networks shaped by economic, political, and cultural pressures, yet remain culturally recognized as singular visionaries. As Bauman observes, "work has drifted… to the realm of a game", where short-term objectives dominate over long-term consequences.[5] The architect's agency is diffused, but the expectation of full responsibility persists, producing tension between systemic influence and individual accountability.

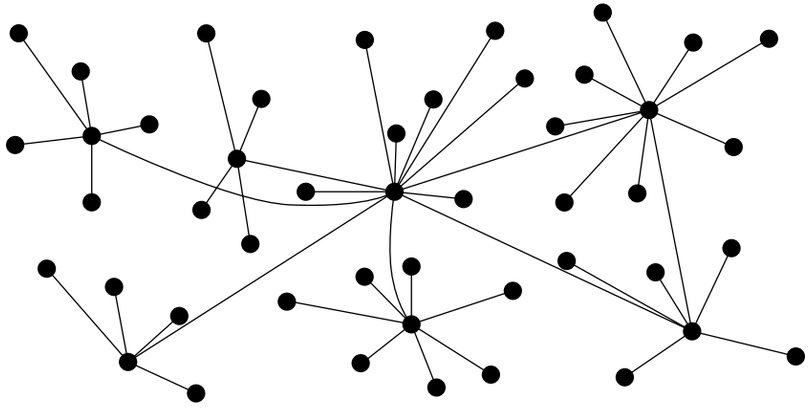
The Visionary Mask and the Burden of Singular Responsibility: To address responsibility within contemporary architectural practice, it must first be understood not as a voluntary ethical stance, but as an imposed expectation. Within existing professional, legal, and cultural frameworks, accountability is largely confined to technical and regulatory obligations such as permits, safety, and compliance. The broader social, cultural, and environmental consequences of architecture, however, lack clear channels through which responsibility can be meaningfully enforced. Under these conditions, architects remain legally accountable for technical obligations, yet the broader, intangible impacts of their work demand an expectation of responsibility imposed not only on the architect individually but also by society and cultural norms.

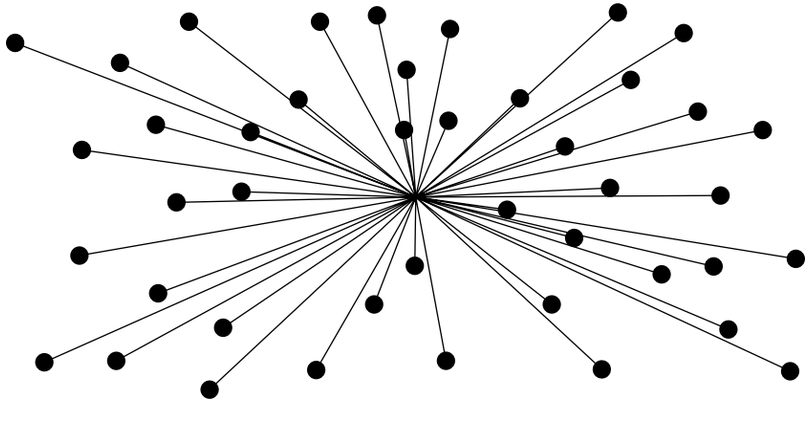
Within this paradigm, responsibility operates less as a reflection of agency and more as a structural requirement. Accountability is concentrated in the architect not because they alone control outcomes, but because the system demands a visible bearer of responsibility. The persistence of the architect as visionary sustains this concentration, reinforcing the appearance of individual authorship. Yet the broader social, economic, and technical forces that shape architectural outcomes distribute influence across many actors, making it impossible for architects to bear responsibility

5. Mario Carpo, The Second Digital Turn: Design Beyond Intelligence (Cambridge, MA: MIT Press, 2017), 46.









for the intangible effects on culture, communities, and the environment alone. Responsibility for these outcomes must therefore be recognized as a shared expectation across the network.

The Automation of the Author: Design has reached a threshold where it is increasingly mediated by AI, shifting the architect from singular form-giver to curator of computational processes. Generative systems produce iterations that optimize outcomes beyond conventional human reasoning. As Mario Carpo observes, "information retrieval… is more effective than the traditional, deductive application of scientific formulas".[6] Unlike earlier CAD tools, which merely digitized skills already possessed by architects, current AI tools utilize different logics that transcend typical cognitive capabilities. Rather than executing predefined intentions, these systems generate outcomes that cannot be fully attributed to human intent. As a result, these architectural outcomes can no longer be understood as the product of a singular authorial vision.

Carpo describes this as a posthuman complexity that exceeds traditional small-data logic, making interpretation difficult to trace.[7] When design emerges through the selection and negotiation of learned datasets rather than an act of sole human authorship, the architect's status as author is structurally undermined. The role of the singular visionary persists as a performance, but it no longer reflects how decisions are made across complex, AI-mediated networks.

Robotics and Mediated Outcomes: Robotic fabrication amplifies the diffusion of agency from digital design into material production. Programmers, robotics teams, and automated systems shape the outcome alongside the architect, whose control over material realization is increasingly mediated by technology. As Carpo notes, "the [agents] now tasked to deliver that human touch may not be entirely human anymore," suggesting the architect as one participant within a post-human network.[8] The architect must now negotiate with robotic behaviors, as design becomes a dialogue between pre-pro-

6. Carpo, The Second Digital Turn, 48.

7. Carpo, The Second Digital Turn, 67.

8. Carpo, The Second Digital Turn, 68.

grammed logic and physical constraint. This expansion of the network further increases the architect's distance from the physical outcome. As Carpo states, "instruction to behavior-based fabrication, marks the end of the modern separation between design and building".[9] If the architectural vision is largely shaped by these automated behaviors, the architect's status as the sole author must come into question.

This shift transforms design from a purely human-driven act into a collaborative process between human and non-human agents. The material outcome is no longer solely determined by the architect, and the traditional idea of authorship becomes increasingly uncertain. As the boundary between conception and execution dissolves, the profession faces new questions about responsibility and the distribution of agency in architectural practice.

Distributed Practice: Architects as a Network Node: The cumulative adoption of AI and robotic fabrication transforms the architect from a singular visionary into one node within a larger, distributed network of design. Now, computational systems are capable of participating directly in the design process alongside the human architect, shaping decisions and outcomes in collaboration.

Machine learning systems are generating forms and spatial arrangements from selected parameters, while autonomous robotic systems respond to environmental or behavioral data to shape, place, and articulate architectural components. Together, these technologies actively co-produce our architectural outcomes, making the product of both human and computational authorship.

This shift is a technological reflection of Bauman's notion of liquid modernity, where traditional boundaries of professional authority dissolve into fluid networks of evolving responsibilities.[10] As the role of the architect 'liquefies', authorship and with it responsibility can no longer be understood as a burden assigned to a single actor.

Instead, it emerges collectively between the architect and the technological actors shaping the process. Responsibility is negotiated across both the technologies that mediate design and construction and the human participants whomanage these systems. This establishes a model of shared accountability that mirrors the dispersed roles and diverse contributions shaping contemporary architectural outcomes.

Authorship is no longer absolute but relational, with design decisions arising from the network rather than from isolated acts.

These dynamics lay the groundwork for considering architecture as an implicated discipline, as professionals' decisions are embedded within broader social, technological, and cultural systems. Historically, architects have been perceived as the singular authors of architectural vision, despite the distributed processes through which buildings are actually produced. While these collaborators shaped the outcome, authorship remained attributed to the architect as the originator of the design. The introduction of AI and robotic fabrication further complicates this model, as computational systems increasingly participate in generating and evaluating design decisions rather than simply executing them. The following chapter explores how responsibility is reframed within these interdependent networks, moving from shared agency to implication.

From Detachment to Implication: Building on the understanding of distributed agency, architecture can be understood as an implicated subject operating within networks of culture, media, technology, and political economy, rather than a detached discipline producing isolated works. The practice is shaped by these networks, as decisions, norms, and trends are influenced by external pressures. This interdependence positions architects as participants within a system rather than isolated creators, raising questions about how responsibility should be understood within such networks.

In Implicated Subjects, Michael Rothberg differentiates between guilt and responsibility, drawing on Hannah Arendt he distinguishes guilt, which looks backwards, from responsibility, which is forward-looking and concerned with the consequences of practice.[11] Architects are implicated not because they are individually guilty, but because they operate within these systems. Responsibility requires reflection on how their decisions influence human experience, the environment, and how their practice contributes to broader social and structural outcomes.

Implications Across Human and Technological Agents: If architecture is understood as an implicated subject, responsibility extends across all actors shaping outcomes with technology directly influencing design and production; it cannot reside solely with architects or tools, but rather, it is shared among government, media, and cultural systems. The work's visibility and emphasis on novelty shape both perception and impact, reinforcing that responsibility cannot be attributed only to individual intent or displaced onto technology alone.

The integration of AI and robotics further complicates traditional responsibility frameworks by obscuring the links between decisions and outcomes. Algorithmic optimization, robotic fabrication, and data-driven workflows introduce forms of agency that are neither fully human nor fully autonomous. Yet these systems operate within cultural and economic structures, playing an active role in shaping architectural outcomes. Responsibility therefore remains distributed, with these technologies as participants in the network of implicated architecture rather than neutral tools.

Architectural Response: Implication in Practice: We can use Frank Hindriks & Herman Veluwenkamp's thought experiment of an autonomous vehicle causing unintended harm to a pedestrian to illustrate distributed responsibility across human and technological networks. In their scenario, no single human is directly responsible and accountability is shared across

9. Bauman, Liquid Modernity.

10. Michael Rothberg, The Implicated Subject: Beyond Victims and Perpetrators (Stanford, CA: Stanford University Press, 2019).

11. Frank Hindriks and Herman Veluwenkamp, "The Risks of Autonomous Machines: From Responsibility Gaps to Control Gaps," Synthese 201, no. 1 (2023): https://doi.org/10.1007/s11229-022-04001-5

all actors involved in the vehicle's design, programming, and deployment.[12] Translating this to architecture, imagine a large public building designed and constructed with AI-assisted design tools and robotic assembly systems. Responsibility is distributed across multiple actors, including architects making design choices, engineers programming and maintaining systems, regulatory bodies approving permits, investors shaping priorities, and the broader cultural adoption of AI tools. If the building produces unforeseen negative consequences, such as reinforcing social inequities, exacerbating economic tension, or undermining cultural engagement, no single actor can bear full responsibility. While the autonomous and algorithmic system created what Hindriks & Veluwenkamp refer to as 'responsibility gap', accountability is not removed; it is shared across the entire network of human and non-human actors that shaped the final project.[13]

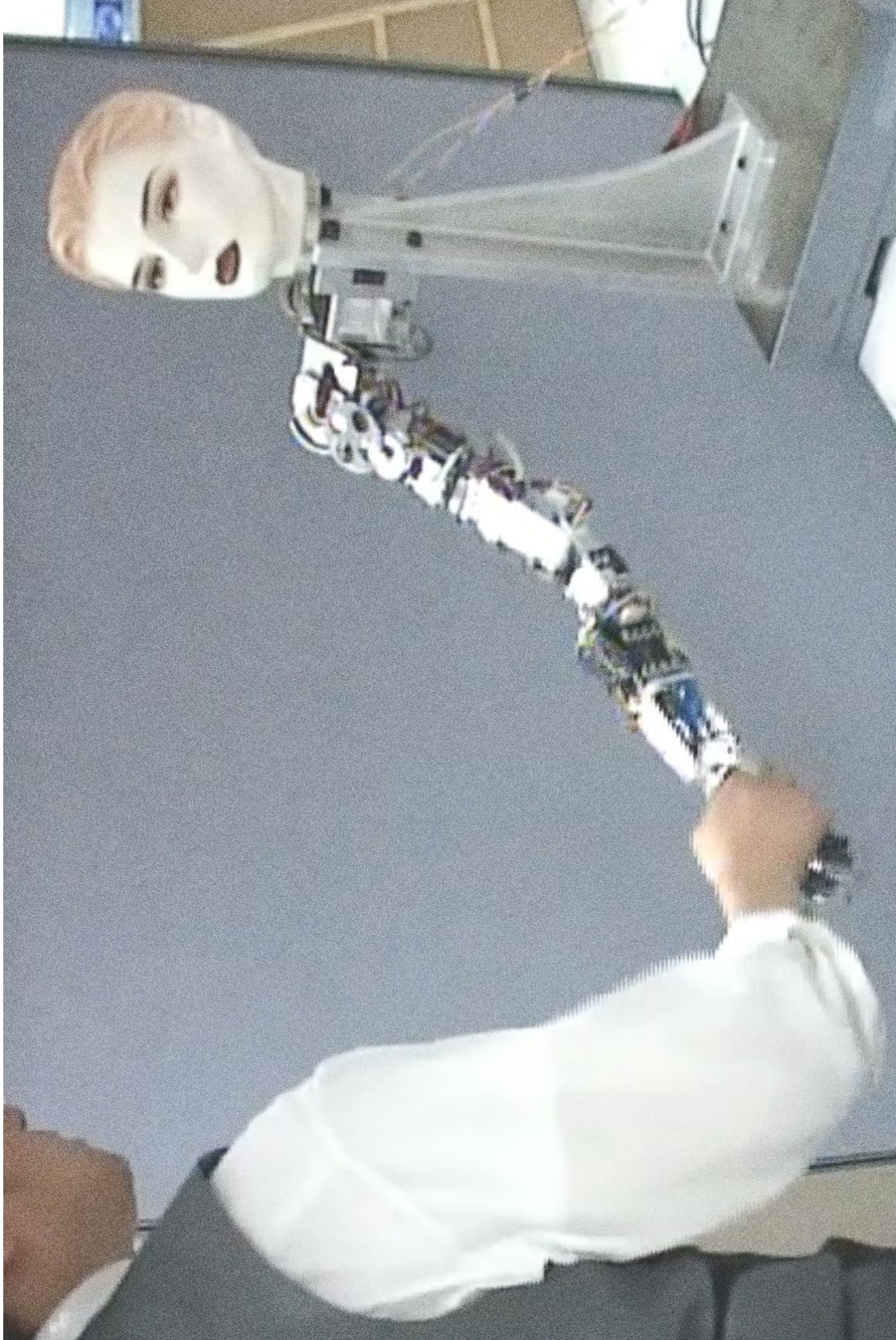
This scenario highlights the ethical implications of technologically mediated architecture. Designers and institutions are responsible not only for construction efficiency or the building's aesthetics, but also for how it affects the people who inhabit and interact with the space and its environment. Negative outcomes emerge not from a single error but from the collective dynamics of the network. Understanding responsibility in this way emphasizes that accountability extends beyond individuals or automated tools.

Contemporary architects often hold authority in shaping the environment without fully facing the responsibilities that come with it, and other actors within the network similarly influence outcomes without always recognizing their own obligations. Responsibility is embedded in these systemic conditions and requires anticipating unintended consequences, whether environmental, social, orcultural. By framing architecture as an implicated subject, the practice demands foresight, reflection, and ethical engagement across the network that shapes architectural outcomes.

12. Hindriks and Veluwenkamp, "The Risks of Autonomous Machines."

13. Rothberg, The Implicated Subject, 47.

14. Kuma, Anti-Object, 42.



Embeddedness in an Anti-Object: Understanding authorship as relational (rather than singularly concentrated) positions it as a continual aspect of architectural practice. In this context, responsibility must also be understood in relational terms, since the attribution of creative agency participates in distributing accountability across the actors involved in architectural production. As Rothberg notes, "we remain captive to a communal responsibility by virtue of our participation in a collective way of life".[14] Architecture is collectively implicated in shaping material, social, and environmental outcomes. As Kuma observes, "architecture is always situated in – and connected to – the world. More precisely, architecture is a device mediating between the subject… and the world".[15] Together, these perspectives highlight how responsibility circulates through networks, extending accountability beyond individual architects to the broader systems and actors shaping architectural outcomes and contributing to the collective experience of architecture.

By reframing responsibility as distributed, traditional notions of authorship are challenged, underscoring the ethical obligation of architects and the networks they operate within to engage critically with produced outcomes. Ultimately, architectural practice is not only a technical or aesthetic endeavor but a moral and social one, requiring foresight, reflection, and collective responsibility across all actors.

14. Kuma, Anti-Object, 42.

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