On Interference. Designing Strange Life Forms that Don't Always Listen

Lydia Kallipoliti

Abstract
If "we judge every object by analogy with our own bodies," as Heinrich Wölfflin argues, then Robin Evan's piezoelectric arthropods and the Boston Dynamic's robotic mules are disturbing, because they are a type of self-mirroring. These mechanical creatures that project our unchecked desires, reveal anthropomorphic characteristics of a contemporary subject: hysterically tumbling and staying afloat throughout adverse and changing external conditions, by reorganizing their internal structure and operative protocols. Partially primal and partially produced with advanced technology, they also reflect a contemporary body of work in architectural discourse that seems particularly relevant in a time of ideological diffusion, when clusters of positions and ideas emerge precariously, not as tactfully positioned manifestoes, but more so, as unnerving life-forms.
This paper will unfold a story intersecting the design of anthropomorphic robots and the projection of architectural desires to the agency of living systems. It will showcase through a science-art-architecture complex the increasing integration of performative, environmental and mechanical functions in building and urban systems, with architecture becoming itself a strange life-form that reacts to the teleology of determinist thinking in design processes.

Affiliation
The Cooper Union, The Irwin S. Chanin School of Architecture

Contacts:
Lydia [dot] kallipoliti [at] cooper [dot] edu

Received:
11 October 2019

Accepted:
10 December 2019

DOI:
10.17454/ARDETH05.13

ARDETH#05

In identifying the origins of innovation in design and entrepreneurship, the positivist ethos of solving a difficult problem as envisioned from the start, is not only the residue of an economic regime, that is neoliberalism, but also a modality of operating in the world and of understanding it.

In unearthing the roots of the Jeffrey Epstein scandal and its multifarious connections with the MIT Media Lab, historian of science Orit Halpern brilliantly exhumes Joi Ito's (former director of the MIT Media Lab) famous slogan: "Deploy or Die!" (Halpern, 2019). Halpern argues, as has Molly Wright Steenson also recently argued, (Steenson, 2019) that Ito's callous call to innovate or perish was well-founded in the history of the global innovation hub. Ito's motto echoed the one of its founder Nicholas Negroponte, "Demo or Die!"– a spin on the academic aphorism "publish or perish". Evidently, this comes as no news in the world of neoliberal governmentality and ethics. To innovate, one must overcome all barriers and initial obstacles against all odds; a vision must be maintained unbroken and it is one's commitment to a cause unaltered that grants valor and eventually yields results. This persistence in surpassing hurdles, which appeals to the corporate propaganda of productivity and the Silicon Valley modus operandi, "think different," "work smarter," or "just do it," has been espoused by architects. Think of Buckminster Fuller's biographical story that on the verge of suicide after losing his daughter, an epiphany occurred to him in developing his lifelong project. Likewise, in the corporate world, temporary failure and its defeat, are essential stages in an individual's progress toward lucrative self-fulfillment (O'Connell, 2014). The most obvious example of an architect determined to trail through rejection is the fictional character Howard Roark – possibly representative of the figure of the modern architect in the twentieth century- in Ayn Rand's *The Fountainhead.* Roark's emergence at the top of the skyscraper he envisioned from the start, becomes a robust material type of advocacy in marketing determinism as a courageous, ethical enterprise, divulging a contested relationship between architecture and neoliberalism. In identifying the origins of innovation in design and entrepreneurship, the positivist ethos of solving a difficult problem as envisioned from the start, is not only the residue of an economic regime, that is neoliberalism, but also a modality of operating in the world and of understanding it.

Against this grain, the then young Robin Evans, author of the landmark book *Translations from Drawing to Building* (Evans, 1997), introduced in 1969 the concept of interference. To Evans, interference was a critical

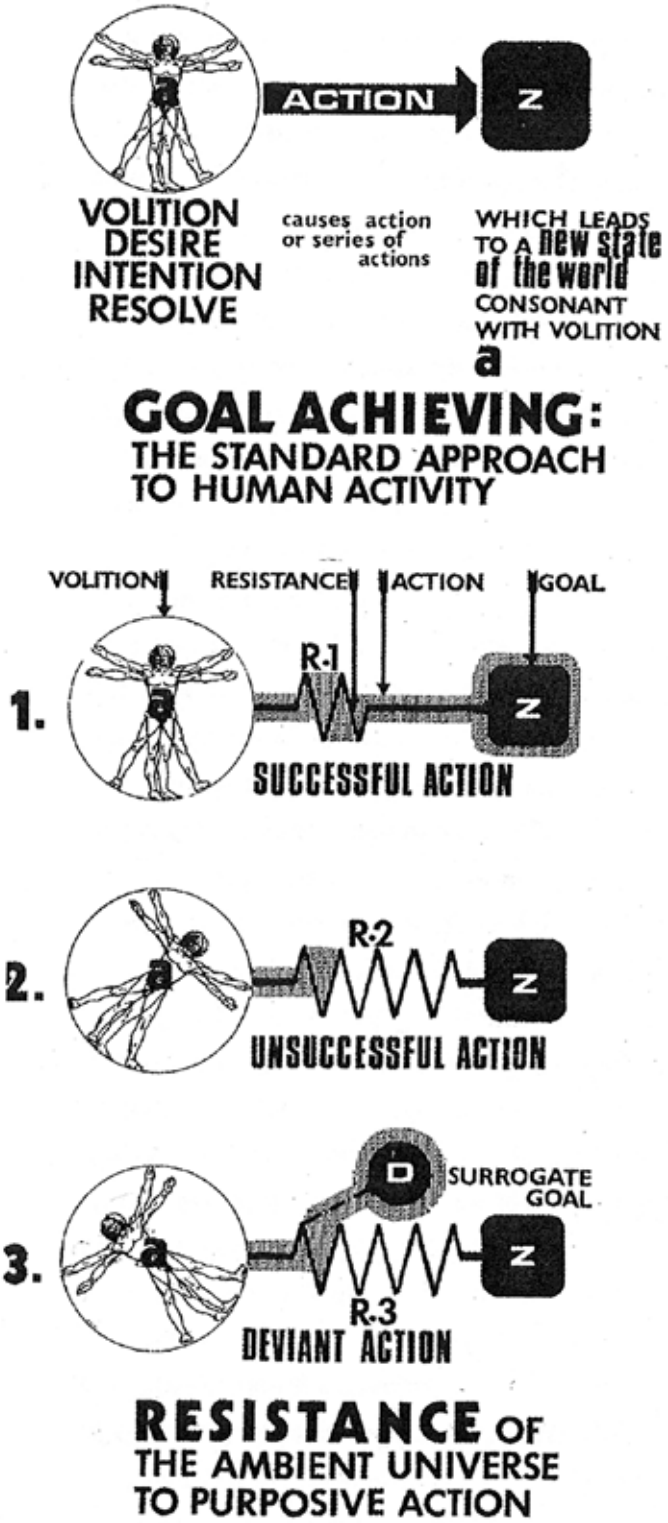

Fig. 1 – Robin Evan's diagram of interference in the transference of energy towards purposive human action. In Robin Evans, Translations from Drawing to Building (Cambridge, MA: MIT Press, 1997).

design parameter to creatively disrupt the expected turn of events. In his thesis at the Architectural Association in London, Evans argued interference was not blocking the course of actions, but revealing a path which would have been invisible in the design process otherwise. Evans used the graphic language of electrical circuits to describe interference in the transference of energy, but was in actuality interested in the course of human actions and the course of history as a metaphor for the design process. He called interference the "resistance of the ambient universe to purposive action" (Evans, 1969) and attested that it was a crucial piece of the puzzle to approximate the complexity of life and design, both non-linear systems. Deviation helped derail a system from its normative end goal and therefore unveil a "surrogate goal," which would open new paths of investigation.

The testing ground for interference was for Evans a series of piezoelectric structures that he designed

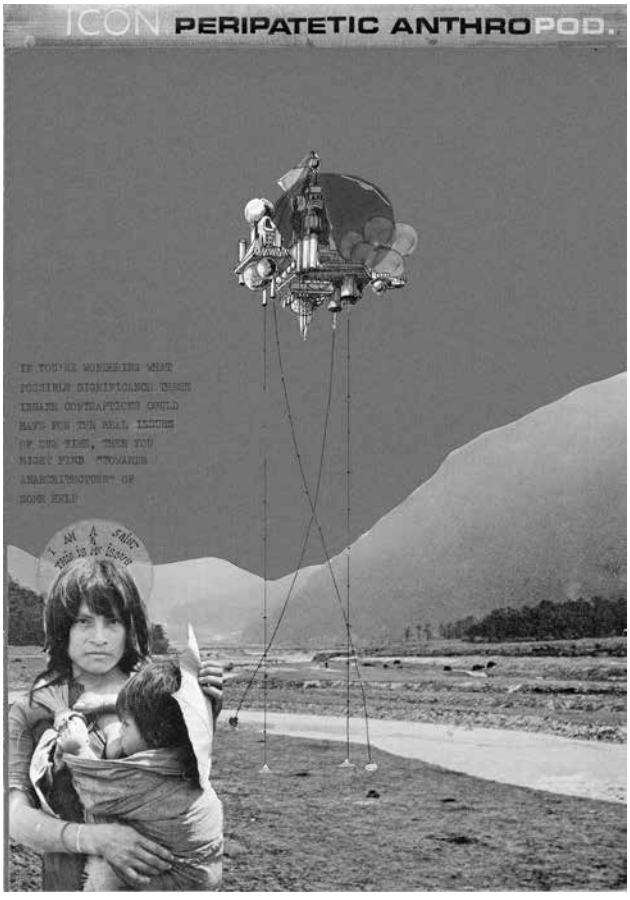

Fig. 2 – Robin Evan's thesis at the Architectural Association in London in 1969 on the creative use of piezoelectric materials. Courtesy of the archives of the Architectural Association.

for this thesis at the AA. As energy-fed structures, these systems were strange mechanical life-forms, alarmingly lively or full of vitality he intermittently pointed out in his notes, sometimes responding to actual needs, other times responding to random and unexpected events. Obedience and teleology were not sought after in Evans' project; the intention was rather to "energize the artifactual world" (Evans, 1969). From early on, Evans was not designing structures to be placed in a passive historized context, be positioned inside environments. He was alternatively designing structures as environments themselves, decentralized to ambient systems of information, where organisms were not the main protagonists. The protagonists were in fact the ambient spheres of interrelated forces.

Evan's peripatetic anthropods, creatures that would respond to environmental forces, demonstrated his belief in a different kind of design agency, one in one in which predetermination was obsolete. Rather than the realization of a single vision, the object of creation could be the crossroad of several different paths.

Rather than the realization of a single vision, the object of creation could be the crossroad of several different paths.

A similarly strange mechanical life-form, peripatetic like Evan's anthropods though prototyped and funded by DARPA, is Boston Dynamic's BigDog, the first four-legged rough terrain robot to leave the lab and take on the real world (Boston Dynamics, 2017). BigDog was rejected by US marines in 2015 because, as they said, it was too loud and would give away their position (Hern, 2015). What is even more disturbing, other than the screechy noise of an adolescent wounded animal, is the fact that anyone encountering a BigDog, is uncertain of whether it is an animal or a machine. In a battlefield, this ambiguity is common to both the enemy and the offender. The two are strangely, albeit unwittingly, united by their common sensation of alienation, of not knowing what it is that they are confronting. BigDog's legs are excerpted from a donkey, while the jumble of wires and mechanical gadgetry on its saddle are proof of its belonging to a long legacy of cybernetic animals and machines.

Despite DARPA's funding and the ongoing need to use BigDog as an efficient pack mule in combat, BigDog is not an unyielding race horse, destined to bring unbridled chaos in combat. In fact, it looks quite nervous and fragile, anxious to restore its balance after

consistently being pushed and abused by Boston Dynamic's engineers. Arguably, the power of this strange mechanical life-form is not redolent of its ability to stay erect, vertical to the ground, but of its continuous state of tumbling. Even more so, the commanding effect it has on viewers is unrelated to the creature's accomplishments of demanding tasks, but its disturbing resemblance to useless features and characteristics of living organisms, such as the chicken's ability to keep its head straight, while the rest of its body is moving (Dillet, 2016). This commanding effect, is not simply a visual categorical mismatch, similar to descriptions of monsters and aberrations as heterogeneous entities that stich together different creatures. Possibly, Boston Dynamic's robot series, acquired by Google in 2013, renders more than anything aesthetic preoccupations on the replication of life, in all its flaws and weaknesses; in all the tumbling effects of creatures that might fall, yet try very hard not to.

BigDog is unsettling because it is a type of self-mirroring. It reveals and projects anthropomorphic characteristics of a contemporary subject.

In fact, BigDog might as well be disturbing, because abstract behavioural aesthetic decisions might have preceded its operational protocols. Considering the remarks of art historian Heinrich Wölfflin, that "we judge every object by analogy with our own bodies," (Wölfflin, 1964: 77) BigDog is unsettling because it is a type of self-mirroring. It reveals and projects anthropomorphic characteristics of a contemporary subject: hysterically tumbling and staying afloat throughout adverse and changing external conditions, by reorganizing its internal structure and operative protocol. This questionable species, partially primal and partially produced with advanced technology, reflects in many ways a contemporary body of work in architectural discourse that seems particularly relevant in a time of ideological diffusion, when clusters of positions and ideas emerge precariously, not as tactfully positioned manifestoes, but more so, as unnerving life-forms. BigDog may also serve as an analogy for a contemporary body of design work, both in its figural character and in its metabolism. With the increasing integration of performative, environmental and mechanical functions in building and urban systems, architecture has become itself a strange life-form that deploys humans to nourish it (Colomina, Wigley, 2016: 75).

The projection of a body to formal organization, independently of whether this body is human, animal or

mechanical, is as longstanding as architecture itself. Vitruvius made a sequence of claims on proportion, symmetry and harmony comparing the human body directly to a building (Vesely, 2002: 192), while Leon Battista Alberti became animalistic in *De re aedifactoria,* as Caroline O'Donnell argues, understanding architecture as analogous to an animal, both as an embodiment of organizational principles, as well as architecture's relationships to climatic and site-related givens (O'Donnell, 2015: 192). The question of balance was key to Alberti -- even numbered supports for buildings analogous to four-legged animals-- and in many respects foundational to Renaissance humanist discourse establishing buildings as whole, stable and balanced bodies. As Anthony Vidler observes, the demolition of the classical body from its privileged place in architectural theory and practice came to foster an aesthetic of calculated disequilibrium in the 1980s and 1990s (Vidler, 1992: xii). The notion of the dismembered, fragmented and composite body, most evident in Donna Haraway's cyborg, rendered an architecture that resisted utopia and wholeness as a generic idea, proposing in its place biotic components -fragments- that can be interfaced and interconnected in endless ways. For Haraway, the cyborg reversed and displaced the hierarchical dualisms of naturalized identities and was detached from biological processes, like birth (Haraway, 1991: 175).

As easy as it would be to claim the BigDog and Evan's anthropods as direct descendants of the cyborg, a hybrid of machine and organism, they imply a different body. It is not a renegade body that asserts itself in the world, allowing the indeterminate to subsist as Deleuze argues for monsters (Villani, 1981: 129-131); it is a destabilized body, arguably a hysteric life-form that one might want to pet. Unlike, performative machines that are mimicking efficient natural functions, these strange life forms are tumbling; arguably, BigDog is not always taking the most efficient route, but instead trying to read the terrain it walks on, mimicking the feats and failures of donkeys. The very concept of biomimicry subordinates technical inventions to the supremacy of natural mechanisms, like self-filling water bottles, and other water collection systems that copy the Stenocara beetle that harvests fog water on its back for future scarcity. And yet,

The disturbing aesthetics of BigDog, divulge our deeply rooted sentimentality in a vain search of primeval ancestral origins.

the strange life forms are more naturalized than the Stenocara beetle water collection systems, precisely because they mimic a donkey's stubbornness, distress and resistance beyond the teleology of performance (carrying load to a certain location). In this sense, they overcome nature, while in search of their own agency in the universe; while several computational feedback loops are at play. It is then their flaws, pathologies and state of indeterminacy that render anthropods and BigDogs disturbingly life-like and hysterically dexterous in recognizing its terrain and opponents. BigDog's investment in its animalistic origins, which are manifest materially and behaviourally via advanced computational protocols and algorithms, parallels the synchronized attentiveness, in the work of an emerging group of architects and theorists, on technical innovation and primal sources. Arguably the design of these robotic prototypes is linked to anthropomorphism, both formally, as well as in the ability of developing machines with primeval interactions, capable of experiencing empathy – a sense of identification with other subjects of the exterior world. Then, if future machines are informed by premodern subjects, possibly the division that Reyner Banham announced in 1960, the one between tradition and technology, or between 'science' and 'history, as he phrased it, has been eviscerated (Banham, 1960). If Banham devised a divide of architecture looking forward – in science –, and architecture looking backwards – in history –, he was firmly located in a point of linear time, in 1960. And as Vidler has argued, during the last 50 years or more, based on this division, the profession needed to re-define its limits in the midst of these competing bids for intellectual domination (Vidler, 2012). Big Dog and Evan's anthropods, nevertheless, as well as a body of design work that is its kin, implies an arrow of time that has been skewed; it reveals a peculiar defensive reaction against the fear of the unknown, manifest by projecting the future not as an entirely new course of events but as an organic thread to primitive instincts. In this sense, the disturbing aesthetics of Big Dog, divulge our deeply rooted sentimentality in a vain search of primeval ancestral origins, or the pathology of pastoralism as Leo Marx put it in his nominal book *The Machine in the Garden.* Marx conjures the writing of Ortega y Gasset in the 1930s and his depiction of

Fig. 3 – BigDog by Boston Dynamics, under a contract with the Defense Advanced Research Projects Agency (DARPA) to make a Legged Squad Support System (LS3). The program's goal is to develop a walking quadruped platform that will augment squads by carrying traditional and new equipment autonomously and will be capable of managing complex terrains.

a new kind of subject rising up in the civilized world the *Naturmensch,* the naturalized man. "This new man wants a motor-car, and enjoys it, but he believes that it is the spontaneous fruit of an Edenic tree. In the depths of this soul he is unaware of the artificial, almost incredible character of civilization, and does not extend his enthusiasm for the instruments to the principles that make them possible." (Marx, 1964: 7-8). In the case of the Big Dog, it could arguably account for the necessity to overlay advanced algorithms for rough terrain navigation with the natural movements of four-legged animals. Then it is the primitive tumbling of this advanced autonomous robot that gratifies the viewer's need for a phantom truth: a stretched notion of time between the past and the future.

The tumbling anthropomorphism of these strange life forms has urgency today. Architecture critics have never ceased to venture in new projections of the body to architectural form, but our contemporary moment shares surprisingly much with the lineage of a primal, unstable, yet skilled tumbling life form that asserts itself, albeit hysterically.

Are strange life forms reflective of a modern subject that is tumbling and navigating precariously

Our contemporary moment shares surprisingly much with the lineage of a primal, unstable, yet skilled tumbling life form that asserts itself, albeit hysterically.

in rough terrains? Today, the only way to navigate through the unimaginable carcass of information we receive, store and upload daily is relative to oneself. Networks, flows and connections between individual units are on their way to extinction. There is only a hyperobject, as Timothy Morton has proposed, which is constantly moving;(Morton, 2010: 130) and, it does not allow you to understand it, which fundamentally alters your mode of existence in space. You are lost unless your only point of origin for navigation is yourself alone. This tumbling corresponds to an ontogenetic, and phylogenetic stage of development (the stage of the "protopsyche"), an operative self-containment, at which the organism has control over nothing but itself. Therefore, the subject enters a state of precarious tumbling relative to its surroundings, a voluntary sense of loss relative to its context. To navigate a rough terrain today, one must use only direction from the self as parameter. In this sense, our need for embeddedness in the world might be obsolete.

Notes

Part of this paper has already been published in M. F. Gage (ed.) *Aesthetics Equals Politics. New Discourses across Art, Architecture, and Philosophy*, Cambridge (MA), The MIT Press, 2019.

References

Banham, R. (1960a), *Architecture after 1960*, "Architectural Review", vol. 127, n. 755.

Banham, R. (1960b), *1960: Stocktaking*, "Architectural Review", vol. 127, n. 756, pp. 93-100.

Banham, R. (1960c), *The science side*, "Architectural Review", vol. 127, n. 757, pp. 188-190.

Banham, R. (1960d), *The future of universal man*, "Architectural Review", vol. 127, n. 758, pp. 253-260.

Banham, R. (1960e), *History under revision*, "Architectural Review", vol. 127, n. 759, pp. 325-332.

Banham, R. (1960f), *Propositions*, "Architectural Review", vol. 127, n. 760.

Boston Dynamics (2017), *BigDog* [Online]. Available at: https://www.bostondynamics.com/bigdog [Accessed: 14 October 2017].

Colomina B., Wigley, M. (2016), *Are We Human? Notes on an Archaeology of Design*, Zurich, Lars Muller Publishers.

Dillet, R. (2016), *Boston Dynamics CEO Marc Raibert demos the spot at disrupt*, "Tech-Crunch" [Online]. Available at: https://techcrunch.com/2016/09/14/boston-dynamics-ceo-

marc-raibert-demos-the-spot-at-disrupt/ [Accessed: 22 August 2017].

Epstein Jones, D., Roberts, B. (2014), *New ancients*, "Log", n. 31, pp. 10-12.

Evans, R. (1969), *Piezoelectric structures*, Thesis at the Architectural Association, Archives of the Architectural Association in London.

Evans, R. (1997), *Translations from Drawing to Building and Other Essays*, Cambridge (MA), The MIT Press.

Halpern, O. (2019), *A History of the MIT Media Lab shows why the recent Epstein scandal is no surprise*, "Art in America" [Online]. Available at: https://www.artnews.com/art-in-america/features/mit-media-lab-jeffrey-epstein-joi-ito-nicholas-negroponte-1202668520/ [Accessed: 23 November 2019].

Haraway, D. (1991), *A cyborg manifesto: Science, technology and socialist-feminism in the late twentieth century*, in *Simians, Cyborgs and Women. The Reinvention of Nature*, New York, Routledge, pp. 149-181.

Hern, A. (2015), *US marines reject BigDog robotic packhorse because it's too noisy*, "The Guardian" [Online]. Available at: https://www.theguardian.com/technology/2015/dec/30/us-marines-reject-bigdog-robot-boston-dynamics-ls3-too-noisy [Accessed: 21 August 2017].

Marx, L. (1964), *The Machine in the Garden; Technology and the Pastoral Ideal in America*, Oxford, Oxford University Press.

Morton, T. (2010), *The Ecological Thought*, Cambridge (MA), Harvard University Press.

Morton, T. (2013), *Hyperobjects: Philosophy and Ecology After the End of the World*, Minneapolis, University of Minnesota Press.

O'Connell, M. (2014), *The stunning success of 'fail' better*, "Slate" [Online]. Available at: http://www.slate.com/articles/arts/culturebox/2014/01/samuel_beckett_s_quote_fail_better_becomes_the_mantra_of_silicon_valley.html [Accessed: 3 June 2018].

O'Donnell, C. (2015), *Niche Tactics: Generative Relationships Between Architecture and Site*, New York, Routledge.

Ortega y Gasset, J. (1950 [1930]), *The Revolt of the Masses*, New York, New American Library.

Vesely, D. (2002), *The architectonics of embodiment*, in G. Dodds, R. Tavernor (eds), *Body and Building: Essays on the Changing Relation of Body and Architecture*, Cambridge (MA), The MIT Press.

Vidler, A. (1992), *The Architectural Uncanny: Essays in the Modern Unhomely*, Cambridge (MA), The MIT Press.

Vidler, A. (2012), *Troubles in Theory Part III: The great divide: technology vs tradition*, "The Architectural Review", vol. 232, n. 1386, pp. 96-101.

Villani, A. (1999), *La guêpe et l'orchidée*, Paris, Belin.

Wölfflin, H. (1964), *Renaissance and Baroque*, London, Collins.

Wright Steenson, M. (2019), *Media Lab's storied history of courting the rich and powerful*, "Gen" [Online]. Available at: https://gen.medium.com/what-you-make-up-for-in-gall-ca1a221122af [Accessed: 19 November 2019].