

Dressing the shadows of architecture

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Abstract

Architecture, as a discipline, resists being defined. It is a discipline that has always drawn on developments from "outside" itself: from art, culture and technology, Yet, it is also possible to define such territories as existing "inside" the definition of architecture. Perhaps the only definition that is always true is that it is a discipline that constantly asks itself what it is. As Cortázar says, "The hardest thing is to surround it..." With the pace of change currently seen in cultural and technological territories, however, it is possible that architecture will be unable to keep up with such changes. A possible solution to this is seen in what might be called "new media architecture" practices that draw on experiences in science, art and technology to research phenomena that are fundamental to architecture.

The hardest thing is to surround it, to fix its limit where it fades into the penumbra along its edge. To choose it from among the others, to separate it from the light that all shadows secretly, dangerously, breathe. To begin to dress it casually, not moving too much, not frightening or dissolving it: this is the initial operation where nothingness lies in every move... To all these it will consent in momentary ignorance... but suddenly it will become troubled... It will repulse the gesture that seeks to crown it with a long blonde wig (that trembling halo around a nonexistent face!)...

Julio Cortázar, To Dress a Shadowⁱ

Every generation seeks to redefine the boundaries of "architecture". This is not surprising, for it is a discipline which constantly borrows territory, physical and philosophical, from so many other disciplines. As such, its boundaries and limits will always be blurred, fluctuating and subjective, drawing on developments in culture, the arts and sciences. However, architecture has always asked itself what it is and it is in a particularly interesting predicament at the moment because it is generally failing to keep up with the pace of technological and societal change. It has largely become a design phenomenon that responds solely to existing conditions, as opposed to a practice that imagines possible futures.

This is partly because most advanced architectural work (in the sense of "the design of space") is these days produced by non-architects. On one hand, technologists at places like MIT Media Lab are developing responsive systems that allow people to interface with their spaces, for example through projection walls, remote devices and 'intelligent' sensors. On the other hand, it is often property developers who instigate technological development for economic reasons, by increasing efficiency or decreasing cost in construction techniques.ⁱⁱ

Even in architect-designed environments, technological developments throw into question the very role of the architect, because user- and environmentally-responsive mechanisms allow people themselves to take prime position in configuring (that is, designing) their own spaces. At the simplest end of the spectrum, a thermostat regulates temperature according to inhabitants' requirements; at the other, systems that allow for changing colour, texture, layout and transparency of walls suggest a circular process of "conversation" with one's environment, a conversation in which architects no longer have priority in defining the boundaries of people's movements and desires. Developments such as wearable computing, mobile connectivity, contextual awareness and RFID systems have transformed both the use and the design of space. These systems are explicitly spatial: they arise out of concerns for the movements and actions of people in space and they suggest a model of spatial design (and by extension architecture) that employs interaction systems to create frameworks of spatial experience.

The territory of such architecture is ambiguous because people themselves interpret, appropriate, design and reuse spaces within their own frames of logic. Such an architecture does not exist without people to inhabit, occupy, perceive, interact or converse with it. These inhabitants "design" their own environments. The resulting spaces don't merely enable people to develop their own ways of responding, they are actually enriched by them doing so. As people become architects of their own spaces (through use of the spaces) the word "architecture" ceases to be a noun: instead it becomes a verb. Such an architecture is explicitly dynamic, a shift that opens up a wealth of poetic possibilities for designers of space.

Meanwhile, it has been people operating within the constantly fluctuating territories of new media art who have had a particular opportunity to challenge the boundaries of space design and, by extension, architectural design. They have explored the changing nature of the relationship of people to their environments, manifested in tangible, feasible, built projects.

Such explorations have taken two distinct approaches. The first has been to look at what might be called "softspace" technologies: systems that incorporate the ephemeral qualities of architecture including smell, sound, light, heat and electromagnetic fields. This approach has concentrated on the interactions that make up our experience of space and has proposed systems to affect these interactions. It has also explored the psychology of spatial perception, helping to expand the boundaries of those perceptions.ⁱⁱⁱ

The second approach has been to investigate how people operate within such environments. Movements in art that challenge accepted dichotomies between performers and audience have parallels in spatial investigations that challenge the distinctions between architects and occupants. These investigations propose new models for environmental design based on systems that welcome the active participation of people operating within those systems, informed by the ways that culture provides frameworks for social interaction. They have considered the notion of "user as designer" and have suggested architectural choreographies and control structures that are improved by participants' contributions. They have also adopted familiar psychogeographical techniques in new propositional ways.^{iv}

Together, these two approaches confront our relationship to designed space because they encourage us to think not of static silent structures that surround us but rather of fluid, transient, dynamic systems within which we are all consumers and all contributors. So how, then, do we determine the difference between "architecture" and "non-architecture" and reconcile the design of space with the contemporary condition? How do we "dress" its "shadows" without "repulsing the gesture"? A clue is, of course, that architecture resists all attempts to give it a rigid definition – it thrives on its penumbral condition and it should recognise its ongoing ephemerality. Yet, architects often have a desire for permanence and have tended to remain confined either to the requirements of economically-motivated clients or to the boundaries of paper and perspex. In an age where we are approaching the design of what industrial design theorist Anthony Dunne has called "post-optimal objects" (i.e. objects one designs once practicality and functionality can be taken for granted) "the most difficult challenges for designers of electronic objects now lie not in technical and semiotic functionality, where optimal levels of performance are already attainable, but in the realms of metaphysics, poetry and aesthetics where little research has been carried out."^v

If we assume that technology systems in architecture could deal with the practical and functional requirements of constructed spaces then the beauty in design comes from the poetics of those who use/implement/remake it. It is this territory that technologists have failed to deal with. In striving for efficiency, convenience, bandwidth and predictability, most computer-engineer-focused architectural technology research has avoided the "delight" of architecture. Projects like Bill Gates' mansion (where occupant-tracking mechanisms allow for programming rooms according to who is in them), time-management systems that ensure we catch the bus on time, or sun-tracking louvres that control temperature levels inside a building are fine engineering solutions but they miss out on the real joys of architecture that arise from the poetics of interaction.

Taking Gordon Pask's words out of context, one can imagine an architecture that "interprets, intends and anticipates"^{vi} and one can accept that such an approach might be more productive than current attempts to create architectural systems that simply respond to stimuli. However, concepts behind designing "intelligent" spaces are accompanied by further ramifications. Just as conversation with other intelligent human beings can be either enjoyable or not, so too would conversations with intelligent spaces: there is no guarantee that

we will appreciate what we discuss! It remains to be seen whether we prefer the captivating moments created by spaces that have moods and aspirations or whether we prefer the predictable 'conversations' we have with ordinary light switches, which can be considered intelligent but very amenable devices.

This is where architects can best participate in spatial design research because their expertise lies in designing spatial "situations". If architecture is a combination of hardware (solid, static walls, roofs and floors) and software (ephemeral sounds, smells, temperatures and electromagnetic waves) then perhaps the most productive conception of an architect is as an "operating system" designer. Just as the designers of operating systems such as Unix, Mac OS X or Windows provide varying levels of openness within which people expand their own creativity (using programs like word processors, drawing software or movie editing suites), so too can architects provide meta-systems that encourage multitudes of architectural programs. The challenge is to develop architectural systems that nourish imagination without adding further layers of prescriptive control. One model of operating system that is particularly relevant to architecture (since the design of space is always a collaborative process) is an open source system.^{vii}

The ephemera of architecture and the constant reinterpretations of the people who thrive in it suggest that one can consider architecture as something impermanent and ineluctable. However, architects have a reputation for seeking stability, for being authoritarian, controlling everything from the lifestyles of a building's inhabitants to the sound of a key turning in a lock. Within a new architectural conception, it is important to ensure that architecture does not become yet another meta-system that "objectively" controls the process from above.

Again, artists who work with technology demonstrate a possible approach. These days they are pioneering new creative research roles. Their strategies allow them to push both the boundaries of technology and the boundaries of art. Architects can learn from these strategies at a practical level, by employing artists' techniques of production (rapid prototyping and low-tech 1:1 implementation), funding (through art and technology grants rather than clients) and self-critique (where project timing is quick enough that feedback from the built project is not so distant that it no longer has an effect on the original proposal). They can also benefit from artists' conceptual approaches by creating works that are socially inquisitive, that critique their own modes of production and that aspire to conversations with other similar projects; by creating works that are, in Matthew Fuller's words "not-just-art"^{viii}. Primarily, though, they can learn from artists who actually make their projects (as opposed to simply proposing them), which allows others to enter into them in order to critique them.

Such a role for architects is similar to that proposed by Steven Groák in *The Idea of Building*, where he develops the concept of "practitioner-researchers":

"What is needed now is a research paradigm, a framework of meaning and practice which derives from technology, from the process of making things, from the concept of "know-how". It will use design and production methods as the cutting edge. It will accept the idea of deterministic processes which are unpredicable."^{ix}

In the eighties and nineties advanced theoretical work in architecture was carried out on paper, in model, in galleries, in books. Now, it is being carried out in interactive installations, in augmented reality, in networked performances. This is the approach adopted by my own architectural research practice, Haque Design + Research and others, such as Aether Architecture, Servo and LAB[au]. By working concurrently in digital media and interactive installations such practices can explore much wider architectural issues.^x With my own projects I have constantly had to straddle the worlds of art and architecture in order to build and test the theses behind them. I have often sought arts-related grants to explore architectural phenomena or to build architectural systems I would like to prototype.^{xi}

An early project was the *Moody Mushroom Floor* (1996), a system of sound, smell and light outputs that develops responses according to how people react to its outputs. The floor adopts notional "moods" determined by their goals; for example, a "sullen" mushroom tries to keep people away from it, though it doesn't know how to do this until it has made several attempts (in the form of sound, smell or light patterns). Similarly, other "moods" (like being "capricious" or "alluring") determine what a mushroom's goals are; if it is successful at achieving a particular mood's goals, it will tend more often to adopt that mood. As a whole, the mushroom community converges on a set of behaviours based on how people act within the space. The project had three aims: first, to explore the idea of an architecture created by ephemeral spatial phenomena such as sound, smell and light; second to develop a system whose environmental outputs were largely dependent on the particular ways that people behaved in the interaction space; and, third, to experiment with a primitive approach to artificial intelligence as applied to architecture (in the form of "genetic algorithms").

My interest in smell as an architectural strategy culminated in a project designed and built with Josephine Pletts and Dr. Luca Turin with the help of a Wellcome Trust Sciart award. *Scents of Space* (2002) is an interactive smell system that allows for the three-dimensional placement of fragrances in space with minimal dispersion due to air movement. The system enables us to move beyond using fragrances for mere branding of space; we are now able to use them to create fragrance collage zones and boundaries on-the-fly. *Scents of Space* posits that if an architectural space could be precisely "tuned" with scent collages, it would be possible to create completely new ways of experiencing, controlling and interacting with space.

In *Scents of Space*, visitors enter the enclosure and experience digitally controlled zones of fragrance that define areas of space without physical boundaries, encouraging them to encounter an invisible yet tangible smell environment. The installation is a carefully orchestrated sensory environment. Smells are emitted singly or in "chords" in combination with a visual cue in the form of glowing cubes. Each of the dozen smells can be precisely and dynamically located in three-dimensional space, allowing visitors to encounter new scent boundaries as they move along the horizontal and vertical axes of the interaction zone.

The fragrances used in the project are both pleasant and unpleasant; recognisable and unfamiliar; natural and artificial. The structure is a simple translucent enclosure, 9 metres in length, that glows inwardly during the day and outwardly at night. Airflow within the space is generated by an array of fans. Moving air is then controlled by a series of diffusion screens to provide smooth and continuous laminar airflow. Computer-controlled fragrance dispensers and careful air control enable parts of the space to be selectively scented without dispersing through the entire space. The air in the interaction space moves at a speed of 0.2 m/s - this is slow enough that visitors don't feel the movement of the air but are merely aware of the smells appearing and disappearing as they move past. As each smell is emitted from the smell wall, the zone from which it comes lights up to indicate that the smell has been activated in that area.

The project *Sky Ear* (2003) is an investigation into the invisible topographies of electromagnetic space. Like sound, smell and temperature, electromagnetic space is evanescent yet fundamental to our architectural experience. We are aware of it through our interactions with mobile devices: when they work, our understanding of distance and location undergoes a crucial transformation; when they don't work (we get no signal or connection) the undulating qualities of electromagnetic space are revealed.

One can imagine the undulating qualities of this invisible topography that surrounds us and affects the way we related to space in much the same way that traditional architectural elements do – it guides us to certain parts of a building, it conditions movements we make and how we make them and, through devices like mobile phones, it has direct impact on the way we associate with other people. Apart from issues arising out of being in contact virtually anywhere, anytime, the mobile technologies through which we conduct our daily lives have made us far more aware of the electromagnetic environment that envelops us.

The project consists of a "cloud" of several hundred glowing helium balloons, embedded with mobile phones. The balloons contain miniature sensor circuits (simple gaussmeters) that detect levels of electromagnetic fields (EMF) at a variety of frequencies. When activated, the sensor circuits cause ultra-bright coloured LEDs to illuminate. The cloud glows and flickers brightly as it passes through varying radio and microwave spaces. As people call into mobile phones embedded in the cloud to listen to the distant sounds of the sky (including audible electromagnetic phenomena like whistlers and spherics), their mobile phone calls trigger ripples of light reminiscent of rumbling thunder and flashes of lightning. The act of listening changes what people are looking at. The 25m diameter carbon fibre framework, supported by 1000 extra-large helium balloons, is released from its ground moorings and slowly floats up into the sky like a glowing jellyfish. The balloons function both as buoyancy/flotation devices and as diffusers for the 6 ultra-bright LED lights (which mix to make millions of colours) controlled by individual sensors inside each balloon. The balloons can communicate with each other via infra-red; this allows them to co-ordinate to create larger patterns across the entire Sky Ear cloud.

Floatables (2004), a project that responds more directly to urban conditions, developed out of research into the nature of wifi space – the space of 802.11 wireless networks that are popular in homes, offices and cafés. It is a project that questions the distinctions between "public" and "private" space, for it seems that the notion of "public" space is just an illusion: even those parts of urban space that are said to belong to an idealised "general public" have strict conceptions of the kinds of activity that can take place within their boundaries. At the same time, though, the idea of "private" space is also fast disappearing as our sanctuaries from the glare of corporations and governments are infiltrated by technology: information about us leaks out of buildings, seeps out of our devices and is accessible to anyone with the appropriate bit of hardware or software. The data that portrays our lives and lifestyles is accessible by so many individuals and organisations that it can no longer claim to lie outside the "public" domain. Our spaces, physical and virtual, are no longer exclusively our own.

Floatables proposes the introduction of jellyfish-like vessels that drift around cities to create temporary, ephemeral zones of privacy: an absence of phone calls, emails, sounds, smells and thermal patterns left behind by others. Through various electrical systems they are also able to prevent access of GPS devices, television broadcasts, wireless networks and other microwave emissions. Finally, by creating a "blurry barrier" and a ground-plane camouflage pattern, they provide shielding from the unembarrassed gaze of security cameras and surveillance satellites. Floating around urban environments, in the tradition of architecture that tries to break free from the confines of gravity, the vessels provide fleeting moments of private visual space, auditory space and olfactory space -- occupants can wander in at will when they happen to catch sight of one nearby. The spaces of absence created here are left to be filled with people's own sounds, alpha-waves, smells and laughs. The vessels are powered mainly by sunlight and wind but are supplemented by inducted electricity from mobile phones and 802.11 networks (in crowded spaces this amounts to several dozen Watts of unexpended power). Buoyancy is achieved by heating or cooling air in a floatation sac, much like hot air balloons. The entire structure can collapse or expand as necessary to alter surface area in response to wind speed and altitude. The vessels have no particular destinations and drift like flotsam around the city. However, they must keep moving because to be discovered by the authorities means almost certain destruction.

Haunt (2004) continues investigations into a non-visual architecture. Using humidity, temperatures and electromagnetic and sonic frequencies that parapsychologists have associated with haunted spaces, this project aims at building an environment that feels "haunted". To talk about haunted spaces is to talk about two things that are explicitly psychological: the sensation of haunting, which is clearly subjective; and the sensation of space, which again depends on the perspective of the particular occupant of that space. Objective analysis of these perceptions always seems to give conflicting results. However, there are some

observed spatial phenomena that tend to correlate with a haunted sensation in a space. Infrasound, at frequencies of 18 or 19Hz, is just outside our ability to hear, however our bodies can feel these low rumblings subliminally. Such frequencies have been shown to elicit feelings of unease and to upset the sense of balance. Wide fluctuations in temperature, which can make hair stand on end, have been associated with apparently haunted spaces. Finally, electromagnetic fields appear to play a particular role in so-called hauntings^{xii}. Some have argued that electric fields from appliances, antennae or nearby power cables have created sensations of haunting. As a result of this, the gaussmeter (which measures levels of EMF) is one of the main tools employed by ghost hunters. There are naturally questions regarding whether these phenomena arise out of existing natural and manmade constructions: power stations, draughty windows, leaking pipes. The project proposed here does not attempt to explain how the phenomena arise, or even how they give rise to haunted perceptions. Rather, the project focuses on how the psychology of human perception gives rise to the construction of space. In pursuing the opposite of what architecture is often assumed to be, this project will attempt to make an uncomfortable space.

Finally, *1000 (little tips of communication)* (2005), a project developed in collaboration with wearable computing designer Despina Papadopoulou (5050ltd), will develop a device and a system that account for technologically-aware bodies in technologically-animated spaces. The project incorporates current and near-future technologies like RFID, GPS, smart dust and smart fabrics to explore the relationship of technology, social bodies and environments. The overall objective of the project is to develop a working prototype of both a "wearable" device and a spatially-oriented system with which it interacts. We are currently working on a series of short experiments that address both of these issues separately and act as stepping stones to the wider project. At the "body" end of the investigations, Electric Ravioli explores circulation patterns and human relationships to non-precious technology. Meanwhile, as a spatial experiment, Selfish Homeostat questions the contention that people would appreciate or benefit from "intelligence" in their environments.

Total words: 3850

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- ⁱ Julio Cortázar, 'To Dress a Shadow', in *Around the Day in Eighty Worlds*, San Francisco, North Point Press, 1986.
- ⁱⁱ For another form of "architecture by non-architects", see also the work of Eyal Weizman on the ways that military organisation appropriates architectural strategies and re-reads the urban context according to its particular requirements. "The Politics of Verticality", <http://www.opendemocracy.net/debates/article-2-45-801.jsp>
- ⁱⁱⁱ See, for example, the work of Juhani Pallasmaa.
- ^{iv} See Glowlab, www.glowlab.com
- ^v Anthony Dunne, *Hertzian Tales*, Royal College of Art, London, 1999
- ^{vi} Gordon Pask, 'The meaning of cybernetics in the behavioural sciences (The cybernetics of behaviour and cognition; extending the meaning of "goal")', in *Cybernetics of Cybernetics*, 2nd ed. Future Systems, Inc., 1995.
- ^{vii} Usman Haque, "Hardspace, softspace and the possibilities of open source architecture", www.haque.co.uk, 2002.
- ^{viii} Matthew Fuller "A Means of Mutation", <http://www.backspace.org/iod/mutation.html>, 1998.
- ^{ix} Steven Groák, "The Idea of Technology, And its Critics", *The Idea of Building*, London, E & FN Spon, 1992.
- ^x Aether Architecture, www.aether.hu; Servo, www.s-e-r-v-o.com; Lab[au], www.lab-au.com
- ^{xi} Haque Design and Research, www.haque.co.uk
- ^{xii} See for example "An investigation into alleged 'hauntings'" by Wiseman, R., Watt, C., Stevens, P., Greening, E. & O'Keeffe, C. (2003). *The British Journal of Psychology*. 94, 195-211.