With space, no longer within

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Abstract: As new technologies, materials and signals begin to transgress Interior space, they hold the potential to increase conceptual resolution and resonance. Formerly benign typologies now have the capacity to exert a more powerful influence that may enable a transition to being with space rather than within. The interior spatial volume has been approached as a fairly inert and constant condition in which objects, inhabitants and events remain privileged as active foreground against a relatively static background condition. With the development of new technologies including sensors, ambient signalling methods, (inter)active materials and the introduction of the biological, informational and emotional into this formerly inactive space, what new potentials are offered? What does an assessment of the nature of transactions within and with space provide? The shifting terrain of the Interior and its resultant spatial upheaval suggest the opportunities afforded by increasing resolution may include the potential to inject semantic value into a formerly vacant territory. This paper will present a series of case studies of recently completed speculative prototypes for the domestic interior. These projects aim to inject and expand the resolution of the domestic terrain by investigating the ability to activate and expand relations between inhabitants and environment. The range of activities and exchanges within space are queried for opportunities to amplify and disrupt. Each project will be examined for the specific stance it engenders toward normative assumptions of use and performance. These projects were exhibited in the summer of 2013 and as a group offer a compelling set of provocations for a newly emergent practice of Interiority.

Keywords: interiority, technology, domestic terrain, interactivity
Interactions and interactivity would seem to be of foremost concern when contemplating the design of an interior space. Interior enclosures are for the express purpose of sheltering, enabling and facilitating human interactions. Yet earnest or well-intentioned attempts to produce interactive space do not necessarily yield spaces with conceptual resonance. Projects that explore the terrain of the interactive have most often been situated as a temporary installation and serve more as entertainment or passing fancy. Usman Haque critiques the limited semantic value of such work in arguing for a more nuanced and embedded relationship between technology and inhabitant: “Nor is it about making another piece of high tech lobby art that responds to flows of people moving through the space, which is just as representational, metaphor encumbered and unchallenging as a polite watercolour landscape.” (61)

Many of the projects discussed here utilize technology but in very particular, strategic ways. Technology is not deployed for novelty but rather to elicit a particular type of attention to otherwise unseen dynamics or potentials. This paper will examine conceptual approaches to interiority which culminated with full scale working prototypes. These projects challenge assumptions about a priori interior conditions. They resist simplistic notions of interactivity and aim to query the underlying cultural assumptions and societal norms relating to the appropriateness of objects and environments. Examining the gap between what is required and what is desired, the works are intended to engage visitors in contemplating the role of objects and environments that form the background of day to day prosaic life.

Usman Haque’s allusion to a polite landscape painting dovetails quite nicely with discussions of contemporary interiors practice and the disciplinary values of elegance, appropriateness and taste level which are paramount. Programmatic concerns are also foregrounded but often constrained by concerns of hierarchy, efficiency and ease. The value added proposition of many designers is their access to a broad array of luxury objects, surfaces and finishes and their ability to deploy these to pleasing effect. Bruce Sterling’s discussion of meta-history is helpful in understanding the unquestioned assumptions running in the background of these practices. These are assumptions that are often unstated and under-recognized but which form the bases of what is considered normal and acceptable versus aberrant and anomalous. Metahistories are omnipresent and, “it’s through metahistory that people come to realize that new things are proper things, new objects that can fit into a metahistorical context are seen as progressive advancements. Otherwise, they are considered alien impositions or curiosities.” (Sterling, 39) If we were to trace the metahistory of interiors practice we would unearth cultural norms, issues of taste and respectability. The prevalence of historical inspiration in addition to the deployment of a wide array of antique objects carry with them their own embedded histories related to use. Aberrant interiors are not often encountered and very rarely requested, one would suspect. Historically, interior practice more so than many contemporary design disciplines is lacking in substantial theoretical inquiry. The service aspect of the discipline seems to supersede questioning in any substantial way the embedded assumptions that comprise the activities of practice as well as the myriad of activities enacted in the resultant finished projects. The lack of a thriving speculative tradition contributes to this void. The discipline could use a much more robust conceptual vein, a so called “paper interiors” practice. This would operate much as the paper architecture tradition in which many younger architects produce and explore ideas in their early experiments relating to the built environment. Anthony Dunne’s Design for Debate agenda is a primary precedent
for this type of work. “This shift from thinking about applications to implications creates a need for new design roles, contexts and methods. It is not only about designing for commercial, market-led contexts and methods, but also for broader societal ones. It is about designing not only products that can be consumed and used today, but also imaginary ones that might exist in years to come.” (Dunne, 91) This type of activity is noticeably absent from a large subset of Interior Design and Interior Architecture programs at the University level and therefore this speculative practice was deliberately structured as a primary focus for the projects presented below. These collaborative projects were completed as yearlong Master’s level theses.

**Boundaries**

The work discussed below attempts to call into question some of the metahistory surrounding Interior environments and objects related to Interiors practice. The injection of semantic content into a traditionally static terrain can manifest in a variety of surprising and challenging ways. The projects explore this territory on several main fronts. The first mode of exploration examines material substrates. Materiality offers a powerful mediating force in our intersection within environments. In activating and exposing unseen material energies and forces we can begin to speculate on a newly emergent relationship with these active entities. Therefore we are no longer surrounded by but instead interacting with. Sean Lally, an architect whose work explores material energies and thresholds, explains that “material energies, for the most part, are either reflected, selected or internally created, taking on a rather minimal amount of responsibility themselves... thus they have been relegated to conditioning predefined interiors or to acting as special effects in creating moods and atmospheres. (11) This minimal responsibility calls into question the role of the designer in exploiting and recouping this potent but undervalued participant.

Several of the projects discussed here begin to call into question the notion of boundaries, ambient phenomena and that which is unseen. Petra Blaisse, a prominent hybrid Interiors practitioner, argues for a conceptually nuanced approach to the design of Interior spaces. “It has now become clear that it is necessary for us to reconsider our profession: to start from zero and reintroduce the invisible, the subconscious, the action-reaction: the sheer biology of things... Let’s start regulating processes in a less obvious, visible way and begin shaping environments that will evolve into things unforeseen.” (Blaisse, 85) The operational terrain of the Interior offers up a multitude of potential interactions between living and non-living entities. While these interactions have traditionally been mediated through placement and selection of furniture and finishes, there is another layer of the Interior which is unseen and yet incredibly potent. By examining the potential for unseen forces to manifest in more performative ways the Interior offers up a broad array of untapped potential for designers to mine and amplify. These unseen forces also harness the potential to act in surprising capacities. Usman Haque outlines such potential in future environments; wondering, “If on the other hand, a designed construct can choose what it senses, either by having ill-defined sensors or by dynamically determining its own perceptual categories, then it moves a step closer to true autonomy which would be required in an authentically interactive
system.” (58) Biological, computational and material logics all may be configured and unleashed to offer up entirely new modes of occupation and relations with environments.

Re-Surface

![Image 1. Re-Surface, Synthetic Bio Floor Surface, Tashia Tucker and Design Futures Lab. © 2013 Nicole Koltick](image)

The Re-Surface project originated from an investigation into the potential of synthetic biology in Interior environments. Several prominent practitioners have been exploring the interaction between biotic matter and architectural space including Dr. Rachel Armstrong, who remains optimistic in her predictions that, “the future implications for architecture in terms of nano-scale modifications to living processes are exciting in that they will form the basis of designer-led, generally responsive materials with innovative properties that will have a broad range of applications in our experience of the built environment.” (89) The Re-Surface project involved the development of a series of novel surfaces for the domestic environment. They were developed and exhibited in tandem, conceived as a speculative product showroom. Each of the surfaces explored materiality at the biological level and invoked synthetic programmable bacteria in various forms. There were three main surfaces developed: a kitchen countertop, a flooring surface and a wall surface. Each of these was prototyped and fabricated for gallery exhibition. Interactive digital equipment was deployed to enable interactive capabilities for each surface.
This project set up an interesting dichotomy and role reversal in terms of the typical reaction to bacteria in our environments. In stark contrast to anti-bacterial soaps and sprays, this project posits bacteria as beneficial agents. Many visitors to the exhibit who interacted with the surfaces expressed considerable discomfort at the very idea of bacteria being deployed in this manner. This reaction speaks to a general ignorance of the enormous role bacteria play in the Interior micro-biome and the way they operate invisibly in both beneficial and harmful ways. This invisible agent in the Interior has the potential to be deployed in more specific and performative ways. In this project the bacteria are invoked and simulated (through digital simulation and projection) with the exception being the bacterial cellulose wall substrate. Despite the simulation, users still reacted very strongly and squeamishly upon interacting with the surfaces. This alludes to a very powerful meta-history relating to our impressions about bacteria in our environments and notions of surfaces as being sterile substrates over which we enact our daily activities. As Lois Weinthal states, “the interior has traits embedded within it that are not always explored strategically, for example the presence of wear and dust signals the action of nature upon the structure and with it, material and artistic opportunity.” (20) This opportunity abounds at multiple levels in the interior and the biological micro-biome is but one powerful layer to be exploited. In this project we were able to inject a powerful semantic overlay to fairly standard surface conditions by unleashing the unseen force of bacteria in our environments.

The floor surface invoked programmable bacteria that would respond to environmental contaminants on the feet including pathogens, pet dander, and odor-causing microbes.
amongst other substances. In response to the presence of these the bacteria would respond and essentially attack and neutralize these entities. The floor surface’s spatial and formal characteristics were informed by microscopic bacterial structures and then digitally designed and fabricated. Visitors were able to step on this surface and colored bacteria would appear to swarm around the user’s feet as they walked around. A swarming algorithm was developed in conjunction with this project and the wall surface with varying behaviors based upon actual bacterial swarming properties.

The wall surface incorporated an additional layer of complexity into the narrative of the project by the development of a bacterial cellulose substrate. Essentially, we were simulating bacterial movement upon a bacterially generated surface. This is a fairly new material which is being developed in experimental applications ranging from healthcare to fashion. The development of the material involves fermenting a bacterial soup made of simple household ingredients. This mixture is allowed to generate over several weeks until a skin develops. The skin is then harvested and dried. The resultant material is incredibly strong and lightweight, similar in consistency to paper but highly resistant to tearing. This project grew an extremely large sheet of the material which was then utilized in a wall surface. The wall surface involved an interactive simulation with visitors waving their hands in front of the surface and the simulated bacteria forming openings in a swarm like motion. This swarming algorithm was developed with a collective behavior biologist. This surface demonstrates the potential for light sensing bacteria to respond to our gestures and swarm accordingly to create openings in a denser field. This could be used to modulate privacy and or light penetration into a space. Users were delighted to interact with this installation and, despite our reassurances that this was a simulation, many people still were sure that they were “seeing” actual bacterial behaviour. The Re-Surface project attempts to visualize phenomena that have been under-recognized or ignored. The project seeks to invoke and expose the potential for these unseen agents in our environment to engage us in a more overt set of exchanges. In the words of Armstrong, these “new emergent relationships and identities will exist at this intimate level that will rival the alleged uniqueness of animate matter and challenge our definitions of life. Synthetic materials will exhibit molecular connectedness with networks, which, in turn, have the potential to make intimate connections with living systems. They will become part of us.” (Rachel Armstrong, 85) It seems appropriate then, that Interiors practice begins to contemplate these emergent intimacies.
Transactions/Exchanges

The Interior has been traditionally understood as a background against which transactions and exchanges are enacted. Surfaces, objects and enclosures will insert themselves more dynamically into these exchanges in the near future. Speculating on these possibilities offers up a fertile terrain from which one can operate. The Situated Interactive Terrain (SIT) is a prototype for a new form of sleeping experience. This project takes the fundamental activity of sleep and seeks to inject a secondary agent to form a new type of exchange between body and furniture. The terrain is a fully actuated surface consisting of robotic actuators covered by a custom silicone membrane. The surface is embedded with an array of sensors which sense the position of occupants. Upon certain inputs including movement, temperature and sound the surface can enact a wide range of moves to gently guide and nudge an occupant during rest. Potential applications include gently rolling someone over when snoring or repositioning a user into an optimal spinal position while sleeping.
This object has an interesting relationship with its users in that the majority of its interaction occurs when one is unconscious. Therefore there is an implicit trust that must be established with this object. Unlike other interactive or smart objects which one may encounter, this transaction requires one to surrender to the agency of the piece. Its logic and decisions are enacted without the possibility for direct, immediate removal, withdrawal or cessation of the experience.
The value of speculating and prototyping experiences of this type allows participants in this scenario to weigh the utility of such an experience against a perceived loss of control or overt intrusion into an incredibly personal activity in a more concrete way. This piece has a fair amount of intelligence in its current iteration but it is also conceivable in the near future that it could develop a far more extensive range of abilities. Dream assistance, intimacy enhancement, nightmare negation; the possibilities are both intriguing and frightening. Science Fiction author and provocateur Bruce Sterling discusses these sorts of exchanges quite regularly. “No material thing can ever achieve full and utter acceptability. People are too ductile to have their problems solved... A “thing” is no more stable than the humans who cherish it. Properly understood, a thing is not merely a material object but a frozen techno-social relationship.” (Sterling, 68) Techno-social relationships and notions of acceptability will become increasingly foregrounded as objects and environments begin to assume more assertive functions within our daily environments. Past behavior indicates that people are quite willing to absorb a perceived loss of agency to gain benefits in convenience. What is less clear is how people will begin to accept more overt intrusions into more intimate spheres of their life. Once static objects and surfaces begin to intrude more extensively and in ways that are much more intimately entwined with us, exchanges take on a heightened importance. Our devices have penetrated the threshold of our domestic spheres but there is still the potential to retreat into analog domestic space. What happens when this backdrop instead becomes foreground?
Thresholds

In contemplating unseen forces in the Interior, thresholds remain incredibly evocative. Boundaries demarcated by spatial cues can obscure more subtle ambient thresholds related to atmospheric, informational or cultural phenomena. *S(ent) Message* inserts itself into a wall surface and assumes an ambient signalling position. It is a new communication device which utilizes scent as its method of exchange. The scent is deployed through the means of an environmental device. Upon receipt of an incoming message this device releases a custom programmed scent within its environment. The scents slowly diffuse and occupants would not be immediately aware of an incoming message. In this way the messaging system is more integrated into inhabitants’ existing activities. The scent library for this device is correlated to a highly personalized and calibrated emotional resonance.
The communication device has two main components. There is the scent transmitter and scent receiver. The transmitter is a small object with a nuanced gradient of color. The colors correlate to specific emotional states and the sender of the message chooses an emotional state to send. This is then transmitted to the distant receiver location. The recipient of the message receives the emotional communication which is translated into their very personal scent language. Scent is tied very strongly to
emotion and memory processing procedures in the brain. This ambient system allows one space to begin to subtly mediate a remote emotional exchange between two parties. The space forms an envelope within which the exchange is enacted. Instead of sounds, images or text space itself imbued with a molecular infusion becomes a medium. Scent within air is but one unseen entity present within Interior space. Electrical, informational and atmospheric exchanges could also be called forth and activated.

*Image 8. Thres(hold) entry, Megan Mitchell and Design Futures Lab. © 2013 Nicole Koltick*
*Thres* (hold) is a project that examines the progression from the exterior public domain into the Interior private domain. Instead of relying only on spatial allocation, this project contemplates ambient exchanges including electromagnetic fields, cell phone signals and informational intrusions across space. The inside/outside demarcation has been a fertile area of inquiry for architects historically. Adolf Loos’s approach to the Interior “seems to establish a radical difference between the interior and exterior, which reflects the split between the intimate and the social life of the metropolitan being: ‘outside,’ the realm of exchange, money and masks; ‘inside’ the realm of the inalienable, the nonexchangeable, and the unspeakable.” (Colomina, 491) In this project the zone of threshold is extended significantly in space. The threshold experience is established as a progressive experience with corresponding physical reactions including light and color attenuation and a wash of air. The enclosure of the threshold is a custom digitally fabricated space and it deploys sensors, light and space to guide the viewer.
The intent here is a decompression experience, a metaphorical cleansing of the exterior. The project seeks to set up a more deliberate experience of transitioning between very disparate modes of behaviour and exchange. One key feature of this project is its dual purpose as a Faraday cage. This device blocks all electronic signals so a user is physically barred from receiving all data. Upon exit of the threshold one is reconnected back to their networks and provided with relevant information relating to the Interior including current occupants.

*Image 9. Thres(hold) Interior. © 2013 Nicole Koltick*
These projects explore the potential of Interiors in a myriad of compelling ways, offering up a glimpse into future issues that may arise in the further intrusion of active agency within our objects, materials and surfaces. Contemplating a relationship with space rather than within forces us to move beyond simplistic notions of interactivity and responsiveness. The complexity of relationships, exchanges, boundaries and thresholds position the Interior as an incredibly evocative space for speculative practice.

References


