

URBAN
COMPUTING
AND ITS
DISCONTENTS

Architecture and Situated Technologies Pamphlet 1

Urban Computing and Its Discontents

Adam Greenfield and Mark Shepard

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THE ARCHITECTURAL LEAGUE OF NEW YORK
SITUATED TECHNOLOGIES PAMPHLETS 1
ADAM GREENFIELD AND MARK SHEPARD

Since the late 1980s, computer scientists and engineers have been researching ways of embedding computational intelligence into the built environment. Looking beyond the model of personal computing, which placed the computer in the foreground of our attention, “ubiquitous” computing takes into account the social dimension of human environments and allows computers themselves to vanish into the background. No longer solely virtual, human interaction with and through computers becomes socially integrated and spatially contingent, as everyday objects and spaces are linked through networked computing.

Recent research has focused on how “situational” parameters inform the design of a wide range of mobile, embedded, wearable, networked, distributed, and location-aware devices. Incorporating an awareness of cultural context, accrued social meanings, and the temporality of spatial experience, Situated Technologies privilege the local, context-specific, and spatially contingent dimensions of their use.

Despite the obvious implications for the built environment, architects have been largely absent from this discussion, and technologists have been limited to developing technologies that take existing architectural topographies as a given context to be augmented. The recent fascination with building envelopes consisting of large-scale programmable urban screens or corporate lobbies outfitted with so-called interactive architecture highlights the dilemma. What opportunities lie beyond the architectural surface as confectionary spectacle or the interior vestibule as glorified automatic door opener?

The Situated Technologies Pamphlet Series extends a discourse initiated in the summer of 2006 by a three-month-long discussion on the Institute for Distributed Creativity (iDC) mailing list, which culminated in the “Architecture and Situated Technologies” symposium at the Urban Center and Eyebeam in New York that October, co-produced by the Center for Virtual Architecture, the Architectural League of New York, and the iDC. The series aims to explore the implications of ubiquitous computing for architecture and urbanism: How are our experience of the city and the choices we make in it affected by mobile communications, pervasive media, ambient informatics, and

other Situated Technologies? How will the ability to design increasingly responsive environments alter the ways we conceive of space? What do architects need to know about urban computing, and what do technologists need to know about cities? How are these issues themselves situated within larger social, cultural, environmental, and political concerns?

Published three times a year over three years, the series is structured as a succession of nine “conversations” between researchers, writers and other practitioners of architecture, art, philosophy of technology, comparative media study, performance studies, and engineering. It takes on the urgent and ambitious task of exploring the implications of emerging technologies and their intersection with daily life. Such a rapid insertion of texts into discourse is rarely witnessed within the context of traditional U.S. publishing, which often requires years to go from manuscript to distribution of the printed book. We feel strongly that the discussion about Situated Technologies cannot be postponed that long. At the same time, we acknowledge that the subject is itself a moving target, as these technologies continue to evolve rapidly. Given these considerations, we’ve opted to publish the series using Print On Demand (POD) technology. Widely used but still little known, this publishing technique allows fast turnaround of books that can be ordered through online bookstores and are indistinguishable from many books in your bookshelf.

Omar Khan, Trebor Scholz, Mark Shepard

Adam Greenfield is a writer, user experience consultant and instructor at New York University's Interactive Telecommunications Program. Before starting his current practice, Studies and Observations, Adam was lead information architect for the Tokyo office of well-known Web consultancy Razorfish. His clients have included Toyota, Sony, Capgemini, and various agencies of the United States government. Adam has spoken frequently on issues of design, culture, technology and user experience before a wide variety of audiences, including the SXSW Interactive festival, LIFT, the European "Civilizations Numériques" conference, Microsoft Research's HCI2020 workshop, Aula, and the O'Reilly Emerging Technology Conference. Most recently, he keynoted the 2007 International Conference on Pervasive Computing. His 2006 book *Everyware: The dawning age of ubiquitous computing*, has been acclaimed as "groundbreaking," "elegant," and "soulful" by Bruce Sterling, and "gracefully written, fascinating, and deeply wise" by Wired's Steve Silberman. He lives and works with his wife, artist Nurri Kim, in New York City.

Mark Shepard is an artist, architect and researcher whose cross-disciplinary practice draws on architecture, film, and new media in addressing new social spaces and signifying structures of contemporary network cultures. His research investigates the impact of mobile and pervasive technologies on architecture and urbanism. His current project, the Tactical Sound Garden [TSG] Toolkit, is an open source software platform for cultivating virtual sound gardens in urban public space. It has been presented at museums, festivals and arts events internationally, including the Contemporary Museum, Baltimore, Maryland; Conflux 2006, Brooklyn, New York; ISEA 2006, San Jose, California; SIGGRAPH 2007, San Diego, California; Futuresonic, Manchester, UK; Sonar Festival, Barcelona, Spain; The Electronic Language International Festival—FILE 2007, São Paulo, Brazil; and the Arte.Mov Festival for Mobile Media, Belo Horizonte, Brazil. He is currently an Assistant Professor of Architecture and Media Study at the University at Buffalo, State University of New York, where he co-directs the Center for Virtual Architecture.

MS The term “urban computing” has recently emerged as a label for research into mobile and pervasive computing situated within urban contexts. Both your course at NYU’s Interactive Telecommunications Program and a recent issue of IEEE’s journal *Pervasive Computing*, guest-edited by Tim Kindberg, Matthew Chalmers, and Eric Paulos, share this title. Can you describe how you arrived at the name?

AG In the Spring semester of 2007, Kevin Slavin of area/code and I started teaching a course called “Urban Computing” at NYU’s Interactive Telecommunications Program. (Sometimes I wish that we had chosen a more zingy title for our class. Eric Paulos at Intel chose “Metapolis” for his Berkeley seminar on similar topics—which, I grant you, has a certain science-fictiony, MVRDV-ish tang to it—but I think we wanted to be a little more transparent. First-timers’ nerves, maybe.)

In proposing such a class, Kevin and I were motivated by a fundamental belief that the ubiquitous and pervasive computing technologies that human-computer interface (HCI) researchers had been discussing for around twenty years could no longer be dismissed as a matter of conjecture. They were, instead, already starting to appear in everyday life, as building systems and public infrastructures, but above all as consumer products—what, after all, could be more ubiquitous than the mobile phone? And from where we stood, it was self-evident that this broad array of networked, embedded, post-desktop computing devices couldn’t possibly *not* have a radically transformative effect on everything we understood as urbanism, on the physical form of the city and on metropolitan experience both.

Now, I had written a book called *Everyware: The dawning age of ubiquitous computing*, which was intended to be the first work on the subject suitable for general, non-academic audiences, while Kevin’s work on Big Games—multiplayer, digitally-mediated experiences played out in real time, against the “board” of the physical city—was leading the gaming industry into places it had rarely if ever explored before. So between the two of us, we had at least some idea of what some of the transformations in question were likely to look like.

We were fairly certain, at the very least, that this turn toward information processing in the environment was going to affect the ways in which we use and understand walls, windows, doors, sidewalks, streets, intersections, parks, markets, and playgrounds. As for the specifics, and as to what would happen when all of these granular components of the city interacted with and built on one another, we frankly had little clue: we figured our students would help us figure it all out. Would it involve building-sized display screens? Geotagging? Mobile social networking? Municipal WiFi? Augmented reality? Embedded RFID tags? Intelligent infrastructure? Yep. All of that—and in fact all of that, all at once.

This, of course, is only part of what we meant by “urban computing”—and at that, the least interesting part. By far more interesting to us was exploring how people respond to, adopt, and understand these technical conditions, and appropriate them for their own uses.

MS How would you distinguish between “urban computing,” “read/write urbanism,” and “ambient informatics”?

AG Well, let’s be honest. I think “urban computing” is one of those terms that’s going to seem awfully dated, very damn soon. You can kind of tell it’s going to have the ring of “horseless carriage” or “rural electrification” before too much longer, because it’s just going to be the way cities are. (If the oil holds out, that is...but that’s another story.) It’s inconceivable to me that cities of the developed world will not make use of the very extensive array of networked digital devices that will be present and available, whether it’s to manage and optimize traffic flows, adjust building envelopes to present conditions, display current conditions of use, or, less happily, present tailored advertising just about anywhere.

Informational inputs—in the form of sensors operating on a variety of channels—and outputs—first in the form of displays, but increasingly as physical actuators in the environment—are becoming decoupled from one another and distributed throughout local reality. Some arbitrary degree of processing and refinement may intervene between input and output—whether it’s data-mining conducted across mul-

tiple relational databases, visualization, or what have you—but that’s basically it in schematic.

“Ambient informatics” refers not so much to that technical substrate or installed infrastructure but to the condition it will give rise to in use. In my book, I defined ambient informatics as “a state in which information is freely available at the point in space and time someone requires it, generally to support a specific decision.” Maybe it’s easiest simply to describe it as information detached from the Web’s creaky armature of pages, sites, feeds, and browsers, and set free instead in the wider world to be accessed when, how, and where you want it: persistently and effortlessly available, just there, like the air. And we’re clearly moving toward just such a state.

Here’s a recent, real-world example that’s eight- or nine-tenths of the way to ambient informatics already. My wife and I were in San Francisco not too long ago, and we met up with some friends of ours in the Mission district for brunch on a Sunday morning. I don’t know if you’ve gone for Sunday brunch in the Mission recently, but it’s gotten insane again—the first three places we tried all had waits of forty-five minutes or more. Totally untenable.

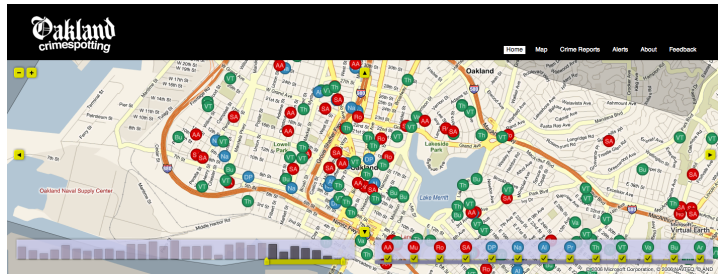
By the time the third place turned us away, we’d been an hour in the hot sun working our way from the Duboce Triangle area to 24th and Mission, and we were cranky, caffeine-deprived and really not having that much fun. Suddenly I remembered a family-style Mexican place that I had really enjoyed a visit or two back, that I thought might be able to seat us. The only problem was that I couldn’t remember what it was called or more than very approximately where it was.

Now this would obviously have been a deal-killer not so very long ago. We would have gone on trying to find some place and for all I know we’d still be wandering the Outer Mission, sunstroked and miserable. But now I have an iPhone in my pocket—nothing if not an aperture by way of which information processing leaks into the everyday—and within, literally, thirty seconds, I had IM’d a friend who gave me the name of the restaurant, looked it up on Google Maps to verify the precise location, and we’d set off. We were tucking into our chilaquiles within minutes.

The whole transaction sounds banal, but that's just the point: it is banal, already, despite the fact that it would have been impossible as recently as two or three years ago. And the transaction's very banality camouflages the elaborate informational choreography involved in its success, to say nothing of the dense infrastructure of servers and routers and transmission towers that in turn supports that.

Can you have urban computing that is not ambient? Sure—but I'd argue that it's a transitional mode. Take a look, for example, at Stamen Design's Oakland Crimespotting. [1] This is a nifty hack that imports Oakland Police Department crime data into a Google Maps mash-up, and does so not willy-nilly but with a fairly high degree of aesthetic polish.

1. Oakland Crimespotting.
<http://oakland.crimespotting.org>.
Courtesy of Stamen Design



The importance of Oakland Crimespotting is that it makes transparent something that absolutely shapes both the affective experience of being in the city and the choices we make there—the actuality of street crime—plotting reported incidents on a map and returning that knowledge to you. But it must be said that its impact is somewhat limited by the fact of its output being limited to a PC, or at best a smartphone, screen.

Why? Because geographically-organized data like this cries out for a direct mapping back to the locations in question. How much more powerful and actionable will things like Crimespotting be when they're ambient—when the information about a place comes to you when you're in that place? When, instead of shaded circles on a screen, you experience the output as a rising tone in your headphones, as a tickle in your shoe or a sudden wash of yellow over the view through your glasses, as you're actually walking through the streets of Oakland?

“Read/write urbanism” is, frankly, jargon, but it’s a pretty neat piece of jargon. It’s Kevin’s way of describing what is novel about urban life under the condition of ambient informatics, the idea that the city’s users are no longer bound to experience passively the territory through which they move but have been empowered to inscribe their subjectivities in the city itself...that those subjectivities can be anchored in place and responded to by those who come after.

So your passage through, your use of, or your investment in this place leaves a tangible informational trace, which can either be gathered up and acted upon individually in the aggregate—as in Esther Polak and Jeroen Kee’s early Amsterdam Realtime [2] and the wide variety of GPS mapping projects which followed it, to cite just one tendency. And again, I think this is just how we’re going to experience metropolitan life moving forward.

MS Let’s bookmark this idea of “read/write urbanism” and come back to it later. First, I’d like to dig a bit deeper into some of the implications of “reading” ambient informatics in cities. Many of the examples you cite have been referred to by others as “locative media”—a form of media art that deploys mobile technologies in mapping bits of media and information to a particular place or location. These projects share a common interest in altering how we locate and orient ourselves within cities, and subsequently navigate through them.

Traditionally, architecture and urban design have served to provide the cues by which this occurs. Kevin Lynch’s *The Image of the City*, a common reference for many locative media theorists and practitioners, attempted to distill a syntax through which a mental map of the city is formed over time through habitual interactions with things like paths, districts, edges, landmarks, and nodes. What I find interesting about ambient informatics is that it suggests a shift from material/tangible cues (streets, squares, rivers, monuments, transportation hubs) to immaterial/ambient ones through which we form our mental maps.

Now, location-based services like Google Maps on a mobile phone may be great for finding a restaurant nearby, but they operate on the

scale of individual patterns of movement. What about information that has the potential to affect larger patterns of movement and activity within the city? I'm thinking of projects like The Institute for Applied Autonomy's project "iSEE" [3], which provides a web-based interface to a map of the locations of surveillance cameras in Manhattan. Using this interface, visitors can map a route from point A to point B that follows a "path of least surveillance."

What's interesting here is that the interface makes visible relatively invisible forces within the city (not unlike Crimespotting), and potentially alters patterns of movement not of a single individual seeking a near-term goal (i.e., that family-style Mexican place) but of a larger constituency sharing concerns for privacy in contemporary public space.



AmsterdamREALTIME: From October 3 to December 1, 2002, approximately sixty Amsterdam residents were equipped with GPS tracer units that recorded each individual's movement through the city. The data was sent in real time to an exhibition space, where it was visualized as a series of lines. Over time, these lines drew a map of Amsterdam that was based on the movements of people rather than streets or blocks of houses.

2. AmsterdamREALTIME, 2002.
Esther Polak, Jeroen Kees and Waag Society.
<http://realtime.waag.org/>

What other opportunities (and dilemmas) exist for urban computing at the scale of infrastructure that, as you say, shape “both the affective experience of being in the city and the choices we make there”?

AG One of the very first things I think of is an ad appearing on the side of New York City buses at the moment. Referring to an earlier ad asking citizens to dial a police hotline if they witnessed suspicious objects or behavior on the city’s mass transit system, the copy reads, “Last year, 1,944 New Yorkers saw something and said something.” To me, it’s just obvious that ads like that will be in the very near future updated in real time—fed by data gathered from the mesh of available sensors in the environment—and that this is going to inflect our feelings in some pretty significant ways, much more intimately and profoundly than contemporary advertising does.

If nothing else, you just know this is the Holy Grail for marketers—you can’t so much as utter the phrase “location-based” or “context-aware” without someone raising the prospect of the discount coupon for lattes that automatically shows up on your phone when you pass through the catchment basin of a Starbucks. It’s one of the biggest interaction-design clichés there is.

But despite the fact that it comes up all the time, relatively few people seem to have taken the next obvious step and imagined what an entire ecology of such ads looks and feels like. This is a scenario that reminds

3. iSEE Manhattan. Courtesy of The Institute for Applied Autonomy.



iSEE Manhattan: The green line indicates the path of least surveillance between the chosen origin and destination. By privileging privacy over convenience, the system has a tendency to generate long circuitous paths, introducing the traveler to an unexpected, previously invisible, topology of their city.



4. The Networked Omniscient. Courtesy of Evan Allen & Matthew Worsnick, Network Architecture Lab Studio, run by Kazys Varnelis, Columbia University GSAPP, Fall 2006.

The Networked Omniscient: Whereas visitors formerly came to New York to experience Times Square, the quintessential public space now experiences its visitors, identifying, cataloguing, and responding to both the mass and the individual.

me of a project that two of Kazys Varnelis's students, Matt Worsnick and Evan Allen, put together last year for their thesis class at Columbia.[4] Matt and Evan projected what the billboardscape of Times Square would look like in the full flush of ambient informatics—they had imagined things like dynamic signs that correlated data gathered from throughout the local area, that inferred higher-level fact patterns from this data, and then everted them, made them public in that larger-than-life way that only a big ol' Broadway billboard can. They really were very clever; they did a great job of working out some of the possibilities. So some of their billboards drew inferences from significant alignments of *place* and *object* (“There’s an illegal Glock crossing 42nd Street. We’re on it!—NYPD”) while others meaningfully correlated *place*, *time* and *identity* (“Jane Doe, if you don’t catch this cab, you’ll miss your flight to Morocco”). I don’t know if I would honestly call that an “opportunity,” strictly speaking...I mean, I guess it’s an opportunity for marketers, but that’s not really so appealing...

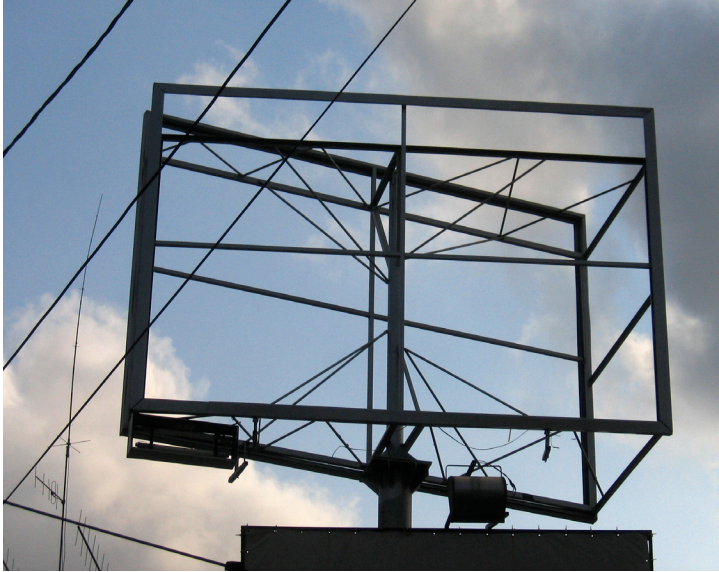
MS You know, it’s interesting that so many of these ambient informatics projects seem simply to expand the reach of

signage and advertising in dense urban spaces. It's as if we've become transfixed by that scene in "Minority Report" where renegade cop John Anderton (played by Tom Cruise) is on the run from his colleagues, and as he's darting through the mall, he's bombarded by ads tailored to his place, time, and identity (a serious liability given his situation). Somehow, many designers take that scenario as something to aim for.

I'm reminded of Tony de Marco's "São Paulo No Logo" Flickr photo set that documents the systematic removal of all advertising in the city of São Paulo, Brazil since January 1, 2007, when the city began enforcing its new "clean city" law banning all advertising: no billboards, no fliers, no neon signs, no electronic panels. [5, 6, 7] This led me to produce a series of images exploring the spatial impact of a similar program in a city like New York. [8, 9, 10] But rather than imagining this being brought about through legislation, I was interested in thinking through the derivate impact on urban space of an alternative, extreme informatics regime, a future-fiction where literally all information loses its body and is off-loaded from the material substrate of the physical city to the personal, portable, or ambient displays of tomorrow's urban information systems. What happens when mobile and pervasive technologies are used to subtract this kind of information from the physical world, reducing rather than adding to the visual field of the street?

AG You know, I'm not so sure that the visual load ever does get reduced. Just because there will be this additional, personal informational channel made available doesn't necessarily imply to me that the mass or building-scale channel goes away. Although I must say that the image I get of your take on things is a striking one—I imagine a rather starkly monochromatic city blossoming into "augmented" chaos when you blink the contact lenses on or whatever...

One of the things I think does happen, though, is that the ability to find one's way around independently of the embedded environmental cues begins to atrophy. This is just that favorite McLuhan quote of mine being worked out in detail: "Every extension is also an amputation." I can



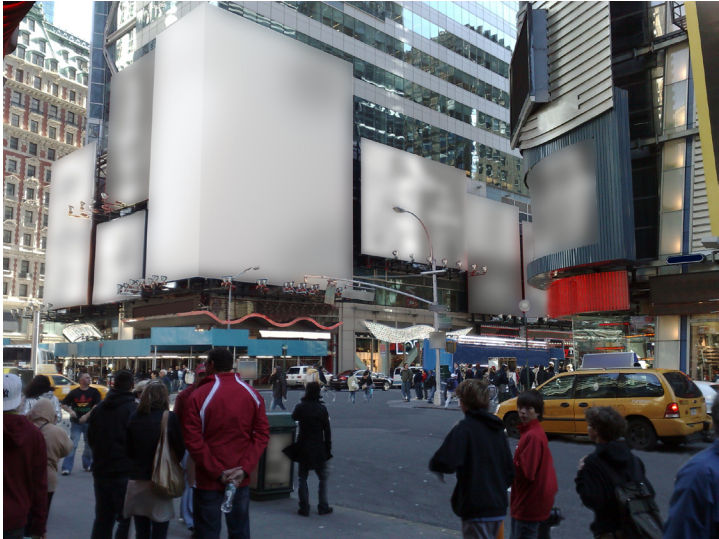
5. São Paulo No Logo. Courtesy of Tony de Marco.
www.nada.com.br



6. São Paulo No Logo. Courtesy of Tony de Marco.
www.nada.com.br



7. São Paulo No Logo. Courtesy of Tony de Marco.
www.nada.com.br



8. Desaturated City, Mark Shepard



9. Desaturated City, Mark Shepard



very easily see traveling to any but the most familiar and local destinations becoming a matter of the cues we're already familiar with from in-car GPS systems, or Yahoo! driving directions, or Hopstop, merely rendered ambient: "Turn left **HERE**." "Get on **THIS TRAIN**." Maybe the train car that aligns with the proper exit at your destination stop even lights up or something.

So what happens when all that crashes—as it surely will from time to time? I mean, we know this about information technology, that every so often it simply goes down, for arbitrary, occult reasons. What happens when you've got a generation of people who are used to following these ambient cues around, and the cues go away? Is the city still legible, in the Lynchian sense, to those people? Or have they lost the ability to discern the locational and navigational cues that have been part of the way we make cities practically since time out of mind? I simply don't know.

MS Right. It's almost as if, in the fascination with the opportunities of new technologies, we're losing sight of the dilemmas. And as you point out, one dilemma has to do with the extent to which our habitual interactions with and through these technologies poten-

tially alter our patterns of behavior—in this case our ability to navigate physical space—without our being aware that it is happening.

I recently attended a conference in Germany on locative media where Katherine Willis mentioned a story in the British media about a school field trip gone bad. Apparently, the bus driver typed in “Hampton Court” in his GPS sat-nav system, but rather than being directed to the popular tourist destination, they wound up at a cul-de-sac in north London bearing the same name. Stories like this are becoming more common these days.

Personally, I found the idea that one could use GPS to get lost intriguing (it reminded me of the old Situationist technique of navigating Paris with a map of London). But seriously, the fact that the bus driver didn’t sense that something was wrong before pulling into that cul-de-sac does raise concerns regarding the flipside of these technologies.

AG And lest anyone still, at this point, think the prospect of urban computing is all kittens and bunnies and roses—I don’t see how anyone could, but some people are just die-hard techno-optimists—we should underline that there are many flipside to ambient informatics. At the request of a client, I’ve been looking lately at some of the ways in which a mesh of networked sensors and effectors can constrain choice in the urban environment—not to put too fine a point on it, but to consider how urban-computing platforms might be used by an authoritarian government to institute social control.

At the most basic level, there’s my contention that an ambient informatic regime—the entire apparatus consisting of ubiquitous, multi-channel embedded sensors, and the data-mining, analysis and visualization tools necessary to leverage them properly—utterly redefines surveillance. It’s not just a matter of cameras and directional microphones anymore: it’s those same inputs provided with face- and voice-recognition technologies. It’s the ability to correlate disparate datapoints, to draw inferences about probable patterns of behavior, to anticipate emergent phenomena—the very same capabilities, in other words, that adaptive advertising was built on, just explicitly turned toward the end of control. As unappealing as it may have sounded, that advertising

suddenly looks comparatively benign, right?

Some of the scariest and most interesting possibilities here bypass crude, Tiananmen-style repression in favor of what might be called soft control. In this aspect of my work, I've been guided by the work of the geographer Steven Flusty, who's identified a range of "characteristics... introduced into urban spaces to make them repellent to the public." He gave each of the five situations he listed particularly evocative names:

stealthy spaces "cannot be found"

slippery spaces "cannot be reached"

crusty spaces "cannot be accessed"

prickly spaces "cannot be occupied comfortably"

jittery spaces "cannot be utilized unobserved"

This taxonomy of urban form is one I think we all intuitively recognize, but it's important that Flusty has gone ahead and given it such precision, such vivid specificity. My project is to go ahead and draw these tendencies out, to consider the ways in which bad actors can use the presence of ambient informatics in the urban environment to enhance its stealthy, slippery, crusty, prickly, and jittery qualities—as well as considering how others might use the same technologies to undermine and to militate against them.

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MS I think this latter is a critical project. A key motivation of the "Architecture and Situated Technologies" symposium was to explore how architects and technologists might occupy the imaginary of technological development in order to influence its impact on the urban environment. To the extent that media conglomerates and federal agencies are responsible for developing and deploying these new technologies, we can expect to see new practices for consumption, surveillance, and control gain momentum.

The current power struggle over file-sharing, copy-protection, and regulation of the wireless spectrum highlights the dilemma. To what degree will people using these technologies be empowered to share, participate, and create? To what degree will their power be limited to consumption? What new forms of surveillance and control are emerging?

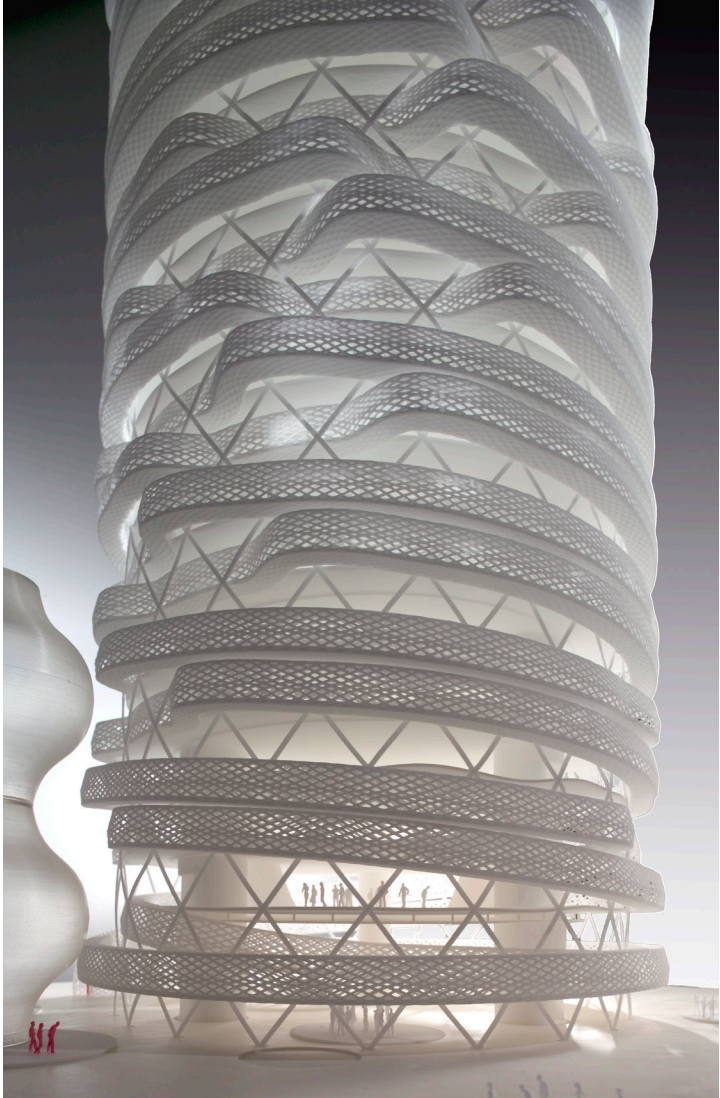
Given these questions, what do you think architects need to know about urban computing? Conversely, what do technologists need to know about cities?

AG I think that, in one or two important senses, architects are actually further along in imagining what cities look and feel like under the condition of ambient informatics than technologists are. From where I sit, the technologist's traditional concerns frequently seem stuck at what I think of as the super-home-theater level, at the level of "well, your house is going to talk to the car through your phone, so your windshield will notify you when you've had a package delivered at home."

OK, woo-hoo, right? It's just this 360-degree-surround of digitally-enhanced lifestyle consumerism, a narrative of effortless ease and convenience and security. Whereas architecture has at least had time to develop a sideband, a critical discourse to accompany the boosterism, and there's certainly as well a time-honored tradition of rendering the imaginary out ahead of its technical deployability, whether we're talking about Sant'Elia, Mies on the Friedrichstrasse, Archigram, or the Metabolists.

So let's consider what architects have thus far made of buildings as networked objects, before ramping up to the scale of cities, because there are some relevant clues to be found there. I think of Peter Testa's Carbon Tower project [11] in this light, which I've previously called out as a great example of "the new architectural morphologies that become possible when computation is everywhere in the structure itself."

In Testa's design, the Carbon Tower is an all-composite, forty-story high-rise, knit, braided, and woven from carbon fiber, that dispenses with all internal bracing. And it's able to do so not merely because of the mechanical properties of its textile exoskeleton but because of the way that exoskeleton is managed digitally. Testa calls this "active lateral bracing": sensors and actuators embedded in the building's structural fiber cinch the outer skin in response to wind load and other dynamic forces. You can't have the building at all without the ability to receive, process, and act upon information.



11. Carbon Tower (2001–2004), Laser-sintered model.
Courtesy of Testa & Weiser Inc., Los Angeles.

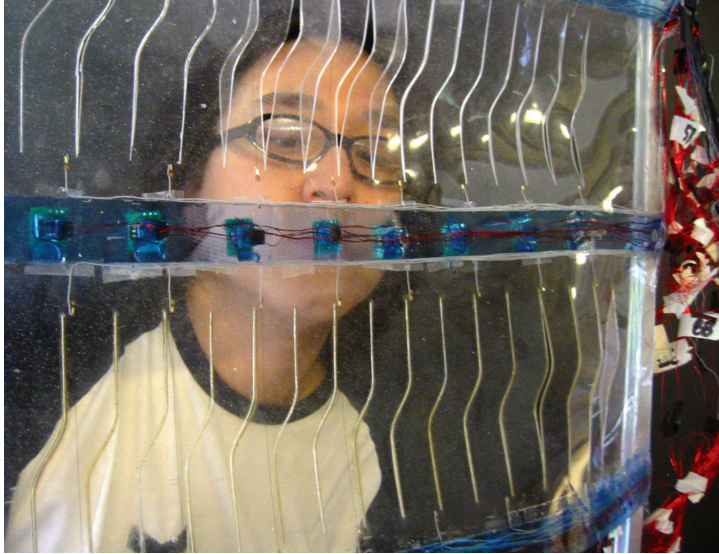
We can see a similar idea, albeit on a more intimate scale, carried through to execution by Soo-In Yang and David Benjamin here in New York: their Living Glass is a louvered window, with embedded sensors coupled to Flexinol actuators, that opens or closes to mediate the carbon-dioxide concentration of the interior space. [12]

Now these are both examples where you have local structure responding to local and entirely physical inputs, but there's nothing in principle keeping a designer from looking farther afield, as it were. If building morphology can be tuned in response to a specified class of inputs, who's to say that those inputs should be limited to the weather?

I'd argue that architects have by no means been slow to pick up on (some of) the implications of networked sensors and effectors. You've got tables at William Stout or Urban Center just yawning beneath the weight of books like Robert Kronenburg's recent survey *Flexible: Architecture that Responds to Change* (Laurence King, 2007), books which are chock-full of projects that incorporate some such digitally mediated interactivity, at least in principle. If most of us don't usually think of buildings as computational artifacts, there's been a steady stream of projects over the past few years—UNStudio's Galleria in Seoul, Peter Cook's Kunsthau Graz, Herzog & deMeuron's Allianz Arena, or at the more poetic and ephemeral end, Diller + Scofidio's Blur pavilion—that rely on just such an understanding, that all depend to varying degrees on formal effects that are digitally managed and mediated. So at least one current of mainstream architectural discourse is moving in that direction.

MS It's true. Architecture has in fact been engaged throughout its history in designing buildings and spaces that adapt to changing conditions. On one level, you could say that architecture is one of the oldest "situated" technologies in that buildings have long been designed to adapt to different sites, climates, or cultures over time.

Further, as you note, more recent advances in digitally managed building systems have enabled greater degrees of structural and energy performance through integrated systems for sensing and reacting to



Living Glass is a thin transparent building skin that measures interior carbon dioxide levels and opens gills to control air flow and to make visible environmental conditions.

changing environmental conditions. There are also numerous projects that explore the building facade as a programmable interface capable of reacting to a variety of inputs.

But there's a big difference between merely reacting or adapting to something and the more complex interplay involved in truly responding. The recent fascination with building envelopes consisting of large-scale programmable "urban screens" or corporate lobbies outfitted with so-called "interactive architecture" highlights the dilemma. Reactive scenarios usually follow a linear causality that involves types of interaction similar to that of a glorified automatic door opener (or thermostat), where ultimately the experience is one where the system registers your presence (or a change in environmental conditions) and reacts to it in a predetermined way. I'd say current mainstream work in so-called "interactive" architecture tends to focus on this mode of interaction. What opportunities lie beyond the architectural surface as confectionary spectacle or the interior vestibule as glorified automatic door opener?

At the “Architecture and Situated Technologies” symposium, Omar Khan introduced the “Fun Palace” —a collaboration between architect Cedric Price, cybernetician Gordon Pask, and theater director Joan Littlewood—as an early precedent for “responsive” architectural environments. In his presentation (which is available as a podcast on www.situatedtechnologies.net) he noted that designing truly responsive systems entails more than the technical manifestation of a one-to-one reaction between input and output (simple goals). Higher-level interactions involve conversations between people and buildings that are capable of mutually learning patterns of activity and adapting to changing intentions (complex goals). The former implies a closed loop in which regardless of what I do, the potential outcomes remain the same, while the latter implies an open system within which my actions can influence the outcome in ways that are not predetermined.

While these basic concepts have been around for a while, they do seem to have found renewed currency in light of the affordances of contemporary mobile and embedded computing. What are some of the challenges you see involved in translating these concepts to ambient informatics and urban computing?

AG The next challenge, as I see it, is moving beyond crudely active, reactive, and even interactive structures to transactional ones, in which each party to the interaction provides the other something of value—you, as user, give the building or the city something it can use, and you get something of equal or greater perceived value in return. To my mind, this goes directly to your question about being empowered to share and participate and create. But getting that delicate negotiation anything close to right is going to be a whole ‘nother order of effort.

This tension between “reactive” and “responsive” remains unresolved, and as far as I can see it is likely to remain so for quite some time to come, especially as we begin to scale our considerations up from individual buildings to the life of the city. One issue that I see, right from the get-go, is that architectural engineering firms don’t at present provide the relevant expertise where it matters most, at the human interface. How are you going to support a conversation among and between all of the users and elements of an environment when your previous

experience is, at best, with Building Management Systems (BMS)—that is, with systems that are designed for reasonably motivated and expert users, operating within sharply circumscribed parameters?

Remember, even at its simplest, we're talking about a situation in which functionality in the environment, even the contour of the environmental envelope, is either being controlled actively and volitionally, or responding to more passive inputs. Some of that input might be derived from sensors embedded in the flooring—a source, in other words, that's going to be relatively persistent, even as the data gathered from it varies—while some might be coming from sensors woven into the clothing of people just passing through. Some of it might be coming from traffic loads on a stretch of sidewalk halfway across town!

You've got privacy issues: do you tell people that you're gathering information from them? If so—and I hope you do—how do you inform them in a way that lets them make a meaningful choice as to whether or not they want to be in this place? You've got issues like deconfliction and precedence to consider: whose orders have priority in this space? What if my biometric sweater says I'm stressed out and lowers the lights and the audio system in response, but when you stroll on in you decide you want the lights up and the music louder? And the primary question, the question that absolutely has to come before anything else: just because we now have the technical ability to, say, correlate lighting levels to the average blood pressure of everyone on the floor, *should* we?

Some of the necessary insight can be supplied by people coming out of the user-experience (UX) community, but even there the focus has historically been on screen-based media. Some of it's going to come from people who've been through formal interaction-design programs. I daresay some of it's going to come from artists and psychologists and ethnographers—communities external to architecture or to urban planning proper. The professional tools and conventions and mind-sets that will be necessary to meet this set of challenges, I can tell you from experience, barely even exist yet.

Another concern is that conversations are, by their nature, open-ended. I've written extensively about the ever-present temptation, in experience

design, to assert control over every aspect of a user interaction, and how this actually tends to degrade the eventual outcome. By the same token, though, where an urban computing application is concerned, the designers are going to have to anticipate the more untoward sorts of emergent behavior likely to arise in their system, and take steps to circumvent the situation in which that arises.

It's, at best, an uneasy balance.

I can all too easily see people representing a variety of fields and disciplines, each of them kind of jockeying to see who's going to be the one to lay down the lines the other kids get to color inside of. Is it going to be the engineer, the architect, the interaction designer? We're all going to have to let go of our tendency to want to control the narrative if we want genuine conversations to emerge.

And again, I'd want designers to attend to the default state, to what engineers call "graceful degradation." Jean Nouvel's Institut du Monde Arabe, I suppose, is a decent example of this—I don't believe the very complicated (and very expensive) sunshade irises have ever functioned properly, but they're indubitably surpassingly lovely, even in a semi-inert state. I don't know what a neighborhood looks like when its technological substrate has defaulted, how it remains viable under conditions where all the various sorts of overlay and intervention and mediation have collapsed... but someone's going to have to put some effort into figuring it out.

MS I agree there is a lack of expertise in this area, although this may be attributed as much to the relative "newness" of the territory as to existing disciplinary boundaries. At the University at Buffalo, we've recently established a graduate program between the departments of Architecture and Media Study that brings together a range of disciplines to research the design of artifacts, spaces, and media that sense and respond to their physical surroundings and the actions and events that transpire there. The goal is to move beyond the interface paradigm of screen, keyboard, and mouse to explore alternate models for interaction with (and through) computers that afford more subtle and complex conversations between a range of human and non-human actors.

One thing we're finding is that collaborative, team-based approaches are far more productive than vertical hierarchies where one discipline dominates, as you suggest. Another issue, as you point out with respect to experience design, has to do with the urge to control every aspect of a design scenario. Instead of seeing emergent behavior as something to circumvent, however, we're looking for ways to work with it. One approach involves revisiting theories of complexity, self-organization and emergence explored in the context of architecture by people like John Frazer at the Architectural Association beginning in the '70s and Greg Lynn at Columbia beginning in the early '90s. But rather than locating strategies for the evolution of form within the context of the design process and the computer screen, we're experimenting with how these theoretical frameworks can help address the complexity of organizations, behaviors, and environments in which media, architecture, and computing converge within physical space.

AG So then, I might turn it around and ask you what you think architects need to know, now, about urban computing?

MS Well, to start, I think we need to begin to recognize that our experience of the city is no longer primarily influenced by urban form but also by the various media, information, and communication technologies we interact with (and through) on a daily basis. This is nothing new, of course—something people have been discussing for over a century. Benjamin, in his seemingly endlessly cited text “The Work of Art in the Age of Mechanical Reproduction,” writes:

Architecture has always represented the prototype of a work of art the reception of which is consummated by a collectivity in a state of distraction... Architecture [is] appropriated in a twofold manner: by use and by perception, or rather, by touch and sight. Such appropriation cannot be understood in terms of the attentive concentration of a tourist before a famous building... [Buildings are appropriated] not so much by attention as by habit.

There remains today a palpable resistance to sullyng Architecture (with a capital “A”, that is) with the less tractable circumstances of the condi-

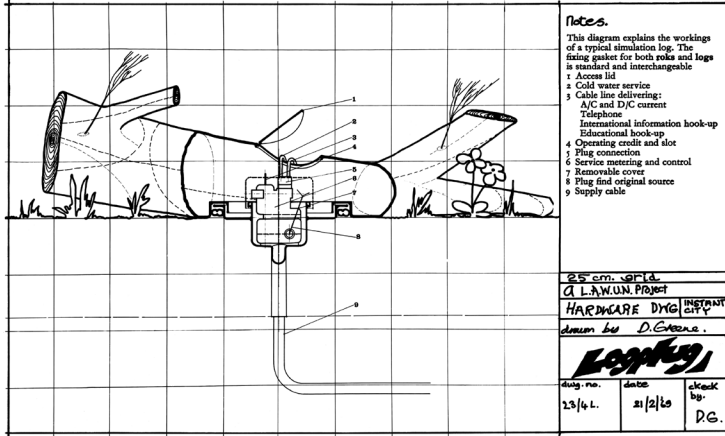
tions of its reception. Peter Eisenman lectures to students today about the importance of “being present in presence.” By this he means, among other things, maintaining focused attention in the face of great works of Architecture in order to be able to engage in careful readings of them. While this is all well and good for the architectural student or tourist—*and is perhaps essential to the autonomy of the discipline itself*—it doesn’t help us understand how architecture is experienced/used in the course of a contemporary daily life saturated with ambient informatics, where attention is distributed across virtual and actual territories.

One thing it does do, however, is focus the debate in terms of attention/distracted. For example, I recently spent the afternoon in a garden at my favorite watering hole in Brooklyn and sat next to a couple who were chatting. The guy was constantly shifting his attention between his conversation partner and his new iPhone. Now it’s common when talking to someone to glance away periodically at other people or things happening around you (I would suggest this is a fundamental attraction of urban environments), but what’s different here is that Mr. iPhone’s attention is constantly shifting between virtual and actual modes of presence. To me, the interesting questions are: What happens when the virtual and the actual are not understood in terms of a strict dichotomy but rather a continuity or a gradient? How might we design for scenarios like this?

AG I think of what’s happening in this scenario (and I agree, this is an almost paradigmatic case) as a wholesale redefinition of adjacency.

In essence, what I see happening here is that the previously sovereign social and material environment of actuality, with its almost boundless ability to press claims for attention on the “user,” is losing a great deal of this primacy, because at any given time you’re no longer merely “next to” the person you’re sharing a table with. You’re also next to the people who happen to be co-present with you in whatever shared presence artifact you’re using. In some cases, indeed, depending on your feelings for the person you’re dining with, you’re going to be closer to them than you are to the person a few inches away from you.

14. Section through Logplug.
 David Greene ©1969 Archigram. Image
 scan ©2007 Archigram Archives.



MS That’s right. And I think if architects saw this phenomenon as an opportunity (rather than a dilemma to be resisted, a threat to disciplinary autonomy) then it would open new sites of practice to the architectural imagination. By studying the complex set of spatial practices people engage with (and through) computing in urban environments, architects would be better positioned to ascertain which aspects of the built environment are truly relevant today, and which need to be completely reimagined. In this regard, I think David Greene’s “Log Plug” [14] was truly visionary. To what degree, for example, have we moved beyond a psychogeography of the “attractions of the terrain”, to a schizogeography of nodes and networks? One might even go so far to ask: to what extent have mobile and pervasive computing actually begun to supplant the autonomy of traditional architectural practice as *the* technology of space-making?

AG Yeah, this is huge. If you pay careful attention to the way in which people physically address space now, you’ll notice that there have been some significant changes under the condition of ambient informatics. Some things persist, of course: as long as there are vertical gravity loads, anyway, people will occasionally need places to sit and rest their weary bones, and so forth. But have a look at this rather telling mosaic [15].



15. Path taken by a woman in a shopping mall whilst talking on her mobile phone. Courtesy of Horst Kiechle.

This is the drunken-seeming meander of a woman speaking on a mobile phone. I think we all recognize this behavior. I do it myself. It's a dead giveaway that the person is immersed in a condition of, at best, ambivalent adjacency. You can't tell me that the woman in this photo is responding to the spatial circumstances around her, except as boundary constraints of the crudest order. She's surely making space, but her choices in doing so are guided by other logics than those that have governed urban form throughout history, the conditions that undergird our understanding of walls, doors, thoroughfares, intersections, and such. To me, if anything can rightly be called "schizo-geography," it's this.

The mobile phone is just the beginning. This goes back to your earlier question about information that inflects the larger patterns of activity



in the city, when you can readily visualize basins of attraction and repulsion overlaid onto the actual—economic attractors, crime hotspots, conditions of enhanced or disrupted pedestrian flow. I think we can see that these are things which will increasingly become—be made—explicit, and they’ll be the aspects that drive large-scale choice. Not just on the basis of proximity, but of preference... of propinquity.

And there’s no way I can see that not coming into conflict with what architecture has always held to be its sovereign imperative, that of authoring space. I’m not going to go as depressingly far as, say, Martin Pawley, in his *Terminal Architecture*—where he rather gleefully posits a world of utterly atomized individuals humping around a blasted and unloved landscape in the networked life-support pods of their aptly-named “terminals.” But I do think formal beauty, certainly, and even

traditional humanist concerns with proportion and texture begin to fade into the background compared with the qualities that make a space amenable to networked use.

I should point out, by the way, that I don't necessarily think this is such a great thing. But it's what I see happening.

MS So would you say the turn toward urban computing fundamentally reinforces or undermines the autonomy of Architecture?

AG Maybe it's my several-year-long marination in business speaking, but I'd say that urban computing creates both a crisis and an opportunity for architecture. On the one hand, of course, you're absolutely right in that it does in my view tend to weaken fatally the privileged argument and position of architectural autonomy. I think the impact on metropolitan experience will somewhat resemble that of what is very unfortunately called Web 2.0 in the internet space—if you thought user-generated content was something to write home about, well, then, you'll get a blast out of user-generated cities!

On the other hand, it opens up a vastly expanded role for interpreters of these conditions, creators of frameworks...authors of "beautiful seams." It will likely require a certain egolessness that has hitherto seemed in short supply in architecture, but those practitioners who are able to achieve it will be able to supply the users of the spaces they design with moments of profound beauty and connection.

MS I want to talk a little bit, here, about technological determinism. I've recently heard/read statements by architects (and media artists, for that matter) regarding certain technologies that somehow impart tremendous agency to relatively inert lumps of metal and silicon.

For example, because we carry a mobile phone, the reasoning goes, we're always reachable and therefore tethered by the social imperative to answer the phone. The fact that mobile phones need to be used by someone for something to have agency is somehow left out of the picture. It's as if voicemail and vibrate mode and all of the intricate

practices and protocols we've developed for their tactical use in particular social situations didn't exist!

So you get some wonderfully absurd design proposals for spaces outfitted with GSM signal blockers presented as a strategy to reclaim a sense of autonomy and privacy in urban public space! Talk about using an RPG to kill a fly..

I think it's important to recognize that technological agency is contingent on its use within a given context toward an explicit goal. Take the iPod, for example. Michael Bull has studied how people use these devices to mitigate contingency in everyday life. On one level, the iPod enables you to personalize the experience of the contemporary city with your own music collection. On the bus, in the park at lunch, while shopping in the deli—the city becomes a film for which you compose the soundtrack.

They also provide gradients of privacy in public places, affording the listener certain exceptions to conventions for social interaction within the public domain. Donning a pair of earbuds grants a certain amount of social license, enabling one to move through the city without necessarily getting too involved, and absolving one from some responsibility to respond to what's happening around them. Some people use earbuds to deflect unwanted attention, finding it easier to avoid responding because they look already occupied. Faced with two people on the sidewalk, we will ask the one without earbuds for directions to the nearest subway entrance. In the same way, removing earbuds when talking to someone pays the speaker a compliment. So in effect, the iPod becomes a tool for organizing space, time, and the boundaries around the body in public space.

In Japan, the mobile phone (or keitai) has been described by Kenichi Fujimoto as a personal "territory machine" capable of transforming any space—a subway train seat, a grocery store aisle, a street corner—into one's own room and personal paradise. Mobile phones there are used less often for voice communications than for asynchronic exchanges of text and images between close circles of friends or associates—exchanges which interject new forms of privacy within otherwise public domains.

So while traditional notions of so-called “cyberspace” promised to unlock us from the limitations of offline relationships and geographic constraints, keitai space flows in and out of ordinary, everyday activities, constantly shifting between virtual and actual realms. Mobile phones in this case are less discrete material interfaces to networked information spaces than they are techno-social performances, in that they enact new relations between people and spaces. What’s interesting is not that urban space itself is changed but more that new hybrid spaces are performed/enacted through habits of mobile phone use.

AG Yeah, I think the risk is that we’ll see architects reifying this and making it overly literal. Fujimoto’s insight—that certain of the potentials inherent to this new class of technologies can be actively and creatively appropriated by users to produce space—on its face I feel like it should shock nobody, but it’s so interesting to me because it’s so very different from what we’d generally hear from social commentary in the West. Here’s a not unrepresentative example, film critic Jonathan Rosenbaum’s response to Jacques Tati’s great “Playtime”:

Mobile phones have sadly made the sense of public urban space as it exists in “Playtime” almost archaic, a kind of lost paradise. The utopian vision of shared space that informs the latter scenes—beginning in the new Royal Garden restaurant at night and continuing the next morning in a drugstore and on the streets of Paris—is made unthinkable by mobile phones, whose use can be said to constitute both a depletion and a form of denial of public space, especially because the people using them tend to ignore the other people in immediate physical proximity to them. Nevertheless, given his capacity to keep abreast of social changes, I have little doubt that Tati, if he were alive today, could and probably would construct wonderful gags involving the use of these phones. And if he were making “Playtime” now, I suspect he’d most likely be inventing gags for the [film’s] first part that involved mobile phones, and then would have to find ways of destroying or disempowering them to make way for the second part.

So I tend to agree with you that the discourse around this stuff—even among people who should know better, who are likely avowed social-

constructionists in just about every other way!—has been surprisingly passive. “Here are these phones, aren’t they awful, look what they do to us!” Rather than asking if different cultures have made divergent choices around mobile technology, and what their outcomes might look like...

MS Ah yes, Tati, the master critic of modernity! His film “Mon Oncle” does to/for the modern house what Rosenbaum seeks for the mobile phone. The emphasis here is obviously on how new communications modalities and technologies are destructive of public space, even of the public sphere or a sense of solidarity among the people who live and work in a city. We’re a long way from “territory machines” now, and while I acknowledge the partial truths of both perspectives, I do wonder if they might be reconciled in the context of ambient informatics.

I also think it’s important not to wax nostalgic about a “lost” public space. If public space was once considered the geography of the public sphere—as the physical embodiment of the sphere where private people come together as a public (Habermas)—today the two operate within increasingly separate domains. Today, notions of “the public,” “publics,” and “public opinion” are formed more through cable and network news channels, internet blogs, and websites than on the sidewalks, streets, cafes, parks, or shopping arcades of the contemporary city. Online social networking sites such as MySpace and Facebook have replaced the street or the mall as the preferred place to “see, be seen, and connect” for today’s youth. Sociable web media such as Flickr enable forms of media sharing and exchange previously unimaginable in physical space. Ultimately, looking forward, I think we need to loosen our grip on categories of public space, the public, publics, etc., if we are to apprehend some of the new possibilities afforded by technologies such as mobile phones.

Now, cities have always been sites of interaction and exchange—of people, goods, services, information, ideas—and technological development has long been a force of change and transformation in the urban environment. As the German sociologist and urbanist Georg Simmel noted at the beginning of the 20th century, before the introduction of buses, subways, and trains in Berlin, people weren’t

accustomed to staring at each other for the course of minutes or hours without speaking to each other. Today reading a book or listening to an iPod on the subway are well-established spatial practices by which we manage these awkward social situations. So along with some of these technological transformations come new social situations, and with them new spatial practices for negotiating daily urban life.

AG “Negotiating” is a funny way to put it, though, implying as it does at least some recognition of the sovereignty of the street. By contrast, I’ll confess that I do tend to think of what happens when people use iPods and Blackberrys and whatnot more as a retreat from that reality, a denial...an abandonment. And this has led even some more sensitive observers of the urban condition to conclude that personal information technology deployed in the urban context inevitably and invariably enriches the personal environment at the expense of the shared public and civic realms.

My argument for urban computing is that this need not be the case, looking forward. I guess I vest my hopes in the possibility that people will use these technologies in creative, spontaneous ways, to produce spaces of resonance and meaning. Is this wishful thinking? Only time will tell.

MS Hannah Arendt has described public space as the place where we encounter the stranger, a space of friction that breeds tolerance through encountering differences in opinion, social standing, ethnicity, economic background, etc. Yet so many of the applications being developed for iPods, Blackberrys, and mobile phones are oriented toward finding a partner with similar interests and maintaining constant contact with our established social networks or favorite places and things. So looking forward, it would seem one strategy for urban computing would be to reclaim urban space as a place for encountering difference. Maybe here it makes sense to return to the notion of “read/write” urbanism that we bookmarked earlier? Focusing on the “write” side of the slash, one thing afforded by some of these technologies is the ability to “contribute” or “input” something of yourself into an ambient urban infoscape. We often hear the term “participation” used today in reference to new technologies that claim to enable, through “open authoring, sharing, and remixing,”

a bottom-up, distributed involvement of non-experts in shaping our views, understanding, and experience of the city.

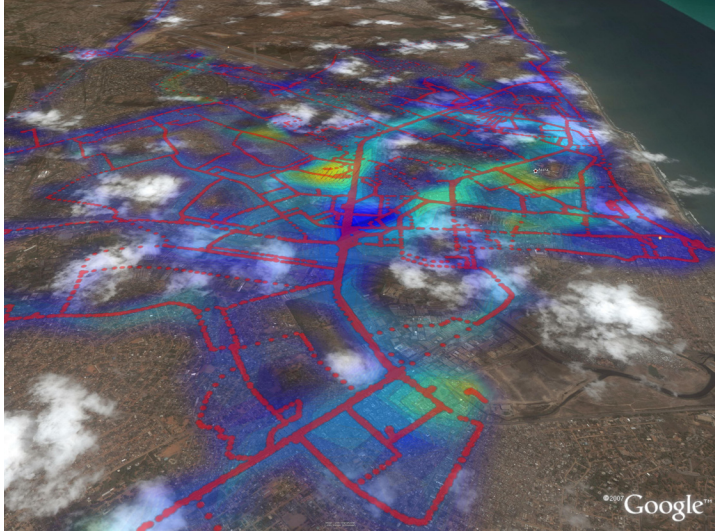
Now in some respects we can see parallels in the attempts by certain architects in the '60s (Archigram, Cedric Price, Yona Friedman, the Metabolists, et al.) that looked toward biological and cybernetic systems for a way out of the oppressive, top-down planning strategies of orthodox modernism. Proponents of “Non-plan” architecture and urbanism sought ways by which average citizens could play an active role in shaping the space they inhabit.

Yet rather than proposing material interventions that are open, extendable, and adaptable to changing patterns of use and activity, it would seem the locus of current research has shifted from designing the architectural “hardware” of what effectively became modular spaceframe structures and services, to the immaterial architecture of “software” infrastructures and their ability to perform or enact new urban organizations and experiences. Yet to what extent do they offer any meaningful sort of participation? And maybe more importantly, what, if anything, have we learned from the failures of the 60's?

AG You know, I'm not sure yet...but I have to say I'm not particularly sanguine on the question. More so than in architecture, there's a distressing tendency toward ahistoricity and amnesia in information technology, a continual tendency to reinvent the wheel and a parallel failure to leverage lessons previously learned.

I do think this, though: urban computing doesn't offer, in any way, a panacea for broken communities, or for our failures to create vibrant, vital, viable communities. Your quoting Hannah Arendt is entirely apropos, and to my mind it's the extent to which this class of systems opens up a safe space within which we can learn to engage with the Other that it will come to be seen as successful.

I guess I'm gently pushing back against some of the things Eric Paulos has written, here, and problematizing the notion that merely allowing an environment to respond to (passively) user-generated data in and



Participatory Urbanism: A heat-map visualization of carbon monoxide readings across Accra, Ghana rendered atop Google Earth. Colors represent individual intensity reading of carbon monoxide during a single 24-hour period across the city. Redcircles are locations where actual readings were taken.

of itself amounts to a “meaningful sort of engagement” with the dynamics of structuration and experience in the city.

MS Right. You’re referring to his project “Participatory Urbanism”, [16] which explores augmenting mobile devices with environmental sensors measuring air quality, noise pollution, UV levels, water quality, etc. He argues that by “empowering everyday citizens to collectively participate in super-sampling their life, city, and environment,” one can effectively “persuade both individuals and civic government towards positive improvements in air quality and environmental change.”

AG That’s right. Eric defines participatory urbanism as the “open authoring, sharing, and remixing of new or existing urban technologies marked by, requiring, or involving participation, especially affording the opportunity for individual citizen participation, sharing, and voice,” and that’s great as far as it goes; the trouble is that I don’t see the projects he describes as actually doing that. Turning me into

a mobile data-gathering sonde does not of me a participant make, let alone a citizen.

MS Well, I often ask my students what they think it means to participate in class, and inevitably there is always one who claims that they are “participating” by simply “being present.”

Taking this response as a point of departure, it might be interesting to think of Paulos’ Participatory Urbanism in relation to the Situationists’ aspirations for *dérive*. Through engaging society at large in performing *dérives*, their declared aim was to research the ambient emotional qualities of cities by enrolling people as “sensors” of the psychogeographic relief of urban topographies.

Debord writes that *dérives* were intended to be conducted in groups, in part to mitigate the radical subjectivity of singular responses to specific urban atmospheres. In this nod to a quasi-objectivist approach, one can draw parallels to Paulos’ Participatory Urbanism. In part, the Situationists’ intention was to generate the “data” by which a so-called Unitary Urbanism based on the ambient emotional qualities of cities could be constructed, or at least lobbied for. And in effect, that’s what Paulos’ mobile environmental sensors would in theory purport to do.

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But it’s important to remember that the *dérive* was not just a research project, it was also a social agenda. In the utopic projection of an alternate society, the theory goes, everyone would engage in a perpetual *dérive*. Active participation of society as a whole was essential in enacting a new social order, producing new types of urban social space. The choices, actions and subsequent encounters that resulted were the very “stuff” from which this new society would be constructed.

It’s not enough to simply “be present,” which would seem to be the only requirement of Paulos’ approach: as long as I’m moving through my daily environments with one of his environmentally-sensitive mobile phones, I’m participating. Might as well attach it to an electronic toy dog, as Natalie Jeremijenko does with her Feral Robotic Dogs. Or to a pigeon, as Beatriz Da Costa did with her project “Pigeon Blog” [17]



PigeonBlog provides an alternative way to participate in environmental air pollution data gathering. The project equips urban homing pigeons with GPS enabled electronic air pollution sensing devices capable of sending real-time location based air pollution and image data to an online mapping/blogging environment.

AG Ah, great. That begins to get at my core concern, because in my book, “participation” is something that necessarily involves choice, agency, and action. It needn’t be a self-consciously political act, but neither is it a matter of simply showing up. And that, with all due respect to him, is what I think gets lost in Eric’s definition.

Situated Technologies Pamphlet 2

Open Source Urbanism

Usman Haque and Matthew Fuller

As the experience of the city becomes increasingly scripted by codes of conduct, local ordinances, and an intensified police presence, this volume explores Open Source Urbanism as a bottom-up approach to “programming” the city.

Situated Technologies Pamphlet 3

Situated Advocacy

The Situated Technologies Pamphlet Series invites submissions for its upcoming volume on “Situated Advocacy”.

Advocacy is the act of arguing on behalf of a particular issue, idea or person, and addresses issues including self-advocacy, environmental protection, the rights of women, youth and minorities, social justice, the re-structured digital divide and political reform. How have Situated Technologies been—or might be—mobilized toward changing and/or influencing social or political policies, practices, and beliefs? What new forms of advocacy are enabled by contemporary location-based or context-aware media and information systems? How might they lend tactical support to the process of managing information flows and disseminating strategic knowledge that influences individual behavior or opinion, corporate conduct or public policy and law?

We are seeking submissions from pairs of authors, in keeping with the format of a “conversation” between two individuals or groups. Please submit a 500 word abstract and short bio for each author (150 words max) in Rich Text Format (RTF) by February 15, 2008 to editors@situatedtechnologies.net. We expect final manuscripts will range from 7,500–10,000 words and will be due by May 16, 2008. Please contact us if you have questions about potential essays or the Situated Technologies Pamphlet Series in general. More information is available at www.situatedtechnologies.net

The Situated Technologies Pamphlet Series consists of nine short pamphlets to be published over the next three years, exploring the implications of ubiquitous computing for architecture and urbanism: how our experience of space and the choices we make within it are affected by a range of mobile, pervasive, embedded or otherwise “situated” technologies. The series will consist of a succession of “conversations” between researchers, writers and other practitioners from architecture, art, science and technology studies, comparative media study, performance studies, and engineering.

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