Spring 2005
Volume 1, Issue 1

URBAN ATMOSPHERES

EDITORS

Eric Paulos
Intel Research
eric@paulos.net

Tom Jenkins
Royal College of Art
thomas.jenkins@rca.ac.uk

PROACTIVE ARCHEOLOGY OF OUR EMERGING URBAN LANDSCAPES

Inside this issue:

The Word on the Street

Urban Atmospheres captures a unique, synergistic moment – expanding urban populations, rapid adoption of Bluetooth mobile devices, tiny ad hoc sensor networks, and the widespread influence of wireless technologies across our growing urban landscapes. The United Nations recently reported that 48 percent of the world's population current live in urban areas and that this number is expected to exceed the 50 percent mark world wide by 2007 [1]. In developed nations the number of urban dwellers is even more dramatic – expected to exceed 75%. Current studies project Bluetooth-enabled devices to reach 5.4 billion units by 2005 – five times the number of mobile phones or Internet connections [2]. Mobile phone penetration already exceeds 80% of the population in places like the European Union (EU) and parts of Asia [3]. WiFi hardware is being deployed at the astonishing rate of one every 4 seconds globally [4]. We argue that now is the time to initiate inspirational research into the very essence of these newly emerging technological urban spaces. We desire to move towards an improved understanding of the emotional experience of urban life.

Place, Community, Infrastructure, and Traversal — the primary themes of Urban Atmospheres

Urban Probing

Urban Computing Themes:

- Place
- Community
- Infrastrcuture
- Traversal

Recall that a probe is an instrument that allows measurement of an unknown – returning hopefully useful or interesting data. While probes can fail, their use is often used early on in fields where broad and rapid data is desired. Technology is emerging in urban landscapes where our complex social roles in urban communities, our movement and traces through cities, and our interactions with place and public artifacts intersect. We argue that these conditions are ideal for probes.

An Urban Probe is a fail-fast approach for asking early questions about urban computing in order to focus and influence future urban research and application choices. It is also a useful methodology for conducting rapid urban application discovery and evaluation metrics.

Urban Probes employ a series

Urban Probing (cont)

Urban Probes

of lightweight provocative urban proto-tasks to inspire direct discussion from people about their current and emerging public urban landscape. These tasks involve physical construction of simple, functional artifacts and accouterments that are introduced into the urban landscape. These are not paper prototypes, but working models of potential systems. Contrary to traditional methodologies surrounding large scale research projects, each Urban Probe is designed to bypass many classical design approaches – opting instead for rapid, nimble, often intentional encroachments on urban places rather than following a series of typical design iteration cycles.

Urban Probes must capture provocative elements of urban computing questions while incorporating opportunities for play, Happenings [20], and various Situationists themes such as *détournement* (rerouting of events and images), and *dérive* (the urban flow of acts and encounters). Similarly, Urban Probes exploit methods of deep observation coupled with experimentation and concrete interventions in urbanism. In practice, Urban Probes develop and deploy novel physical artifacts into everyday urban settings.

Urban Probes draw large inspiration from the work of several leading researchers in developing technology probes and cultural probes [5-6]. Such probes combine the social science goal of collecting information about the use and the users of the technology in a real world setting, the engineering goal of field-testing the technology, and the design goal of inspiring users and designers to imagine new kinds of technology to support their needs and desires.

Urban Probes complements these bodies of work by addressing similar themes with respect to urban life. As technology moves from office to home to street, we want to avoid bringing along with it "workplace" values such as efficiency and productivity at the expense of other possibilities. Urban Probes provide methods that aid researchers in gathering fragmentary glimpses into the rich texture of people's daily urban street life.

The Strange City

Our Familiar Strangers

We began exploring the notion of place and community with some body storming experiments in public places. During our observations, we expected to find physical attributes such as architecture and environment as primary indicators for interpreting public places. However, our studies overwhelmingly revealed that our perception of place is dominated by the people with which we share such spaces. Sometimes these people are friends, family and colleagues. More often, and particularly in public urban spaces we inhabit, the individuals who affect us are ones that we repeatedly observe and yet do not directly interact with – our *Familiar Strangers.*

Familiar Strangers is a social urban phenomenon first explored by psychologist Stanley Milgram who became obsessed with the concept after the 1964 murder of Kitty Genovese in New York City [7-8]. Genovese's murder exposed the tenuous and conditional links urban dwellers have to their neighbors and community of Familiar Strangers. Genovese was murdered on the streets of New York City while her neighbors listened to her die. Not one called the police or came to her aid. Afraid for their own safety, they were psychologically handicapped and emotionally bankrupt, unable to even telephone the police for help.

That was 40 years ago. Surely, our relationship with our community of strangers has changed? However, recent trends in mobile phone usage increasingly divide people from co-located strangers within their community. Uncomfortable in strange situations or public places, people reach for their mobile phones, dramatically decreasing the chance of interacting with individuals outside of their social groups. We hope that our exploration of Familiar Strangers will promote development of novel and socially appropriate tools that strive to improve community solidarity and a sense of belonging in urban spaces.

Jabberwocky

Named after Lewis Carroll's famous nonsensical poem, *Jabberwocky*, is a MIDP 2.0 mobile phone application. The principle metaphors of *Jabberwocky* is that of "digital scent". As individuals traverse an urban landscape, they simply infuse their path with a unique and detectable digital redolence. These scents and tags are localized and can be implemented easily using many of today's low power radios and personal wireless protocols such as Bluetooth.

As two people approach one another, each person's individually carried *Jabberwocky* mobile phone application uses the onboard Bluetooth radio to transparently detect and record the other's unique identity. In fact the beauty of the application is that it still operates even if the other Bluetooth mobile phone is not running the *Jabberwocky* application. Every enabled Bluetooth device broadcasts a unique identifier. Over time the *Jabberwocky* application accumulates a log of unique entries of people that have been previously encountered.

Later, as the user crosses through another part of the city, takes the subway, or waits at a street corner, the *Jabberwocky* application senses nearby groups and crows and renders an abstract real-time visualization of familiarity. It is able to account for the amount of Familiar Strangers nearby as well as a notion of your shared history with them.

Jabberwocky mobile phone application

Flotsam and Jetsam

Urban life is largely composed of the movement, activities and familiar patterns of people within and across our crowded urban landscapes. There is also a curiosity, perhaps even verging on a voyeuristic interest in the lives of our fellow urban neighbors. As we traverse our city we share time and space with others. As we idle awaiting a bus, or navigate to our local café, we encounter other strangers. Often unconsciously we create fictitious stories about the lives of these people – that woman owns two cats, than man is a vegan, that child is lonely. These people and the way they dress and behave on public city streets provide us an insight into the lives of others.

We conducted an Urban Probe to understand this urban space. The probe was call Jetsam [9] that resulted in the construction of a fully functional augmented trashcan. The augmented can exposes city dwellers to the pattern of trash interactions as told from the point of view of a single city trashcan. Two event types can be sensed: interaction events and trash in/out events (including the type of trash involved). We used a simple IR photoelectrical switch to detect a basic interaction with the trashcan such as searching. A sensitive electronic scale determines the current weight of trash entering or leaving the bin. Mounted within the trashcan, an overhead camera records the top layer of trash in the bin. A laptop computer connects the devices and projects an appropriate visualization from the trashcan's opening onto the city street

There are several methods of interaction with the augmented trashcan: *active*, *passive*, and *mobile*. Tossing trash into or removing trash from the augmented trashcan is an *active* interaction. For example, after finishing her lunch while sitting on a nearby bench, Jill tosses her bag of trash away. The augmented trashcan detects the event as the item enters the bin. Using the camera and digital scale, information about the new trash is logged. Its weight is measured and a rough image of the trash is extracted by subtracting out the previous image of the top of the trash from the current. The isolated image of the trash, its time, and weight are all logged. After a short time, an image of the individual item is introduced into the animated, projected visualization. Any individual passing near the augmented trashcan interacts *passively* with it by observing its shifting visualization. Recent items appear closer to the base of the trashcan and slowly "orbit" outward over time. Each trash image also rotates on its axis based on its weight with heavy items spinning slowly and light items more quickly. The resulting visualization depicts a layering of trashcan activities and patterns, not unlike the archeological layers typically found during years of drought or catastrophic change.

"Let us embrace the full scope of urban life with all of its emotions and experiences"

— Eric Paulos

The deployed Urban Probe — Jetsam

Editors

Eric Paulos
Intel Research
eric@paulos.net

Tom Jenkins
Royal College of Art
thomas.jenkins@rca.ac.uk

Intel Research
2150 Shattuck Avenue #1300
Berkeley, CA 94704

Check us out on the web

www.urban-atmospheres.net

Proactive Archeology of Urban Space and Technology

The Urban Atmospheres newsletter is published on a completely random basis. It provides information about developments, ideas, and reflections of urban life. It strives as much to generate new questions and dilemmas as to answer existing ones while increasing the dialogue across a diverse range of urban practitioners.

REFERENCES

[1] United Nations. Dept. of International Economic and Social Affairs., United Nations. Dept. for Economic and Social Information and Policy Analysis., and United Nations. Dept. of Economic and Social Affairs. Population Division., "World urbanization prospects:The 2003 Revision." New York: United Nations Dept. of International Economic and Social Affairs, 2003.

[2] "Merrill Lynch Report: Bluetooth Handbook," 29 June 2000.

[3] "eMarketer Chart: Mobile Phone Penetration Rate for Select Countries in the Asia-Pacific Region," 2002.

[4] G. Paulo, "4Q 2002 WLAN Market Analysis," Cahners In-Stat Group 19 March 2003.

[5] S. Milgram, The individual in a social world : essays and experiments. Reading, Mass.: Addison-Wesley Pub. Co., 1977.

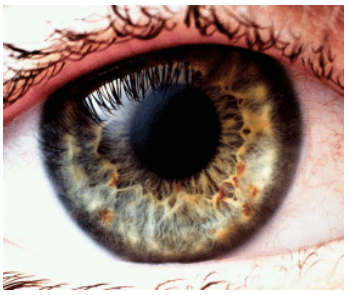
[6] E. Paulos and E. Goodman, "The Familiar Stranger: Anxiety, Comfort , and Play in Public Places," presented at ACM SIGCHI, 2004.

[7] B. Gaver, T. Dunne, and E. Pacenti, "Design: Cultural Probes," ACM Interactions, vol. 6, pp. 21-29, 1999.

[8] H. Hutchinson, W. Mackay, B. Westerlund, B. B. Bederson, A. Druin, C. Plaisant, M. Beaudouin-Lafon, S. Conversy, H. Evans, H. Hansen, N. Roussel, B. Eiderbäck, S. Lindquist, and Y. Sundblad, "Technoloy Probes: Inspiring Design for and with Families," presented at ACM SIGCHI, 2003.

[9] E. Paulos and T. Jenkins, "Urban Probes: Our Emerging Urban Atmospheres," presented at ACM SIGCHI, 2005.

Stratagems



Let us all create our Urban Future

We argue for an approach that encourages a more divergent brainstorming style – explicitly away from the dominate research themes that continuously promote efficiency and productivity. Let us embrace the full scope of urban life with all of its emotions and experiences. This research investigation must begin before urban inhabitants acquire strong mental models and expectations from the current emerging suite of standardized urban applications. Finally, we encourage urban inhabitants to become proactive in the evolving and future design of our urban landscapes. In the spirit of cultural and technology probes we propose a lightweight, provocative, inspirational research methodology for exploring computing in urban environment.