QUT Digital Repository:
http://eprints.qut.edu.au/

This is the author version published as:

Foth, Marcus and Forlano, Laura and Hattori, Hiromitsu (2009) *Digital cities 6 : concepts, methods and systems of urban informatics (Workshop)*. In: 4th International Conference on Communities and Technologies, 24-27 June 2009, University Park, Pennsylvania.

Conference Workshop Proceedings

Digital Cities 6:
Concepts, Methods and Systems of Urban Informatics

Workshop held in conjunction with C&T 2009

24th June 2009, The Pennsylvania State University, PA, USA

Workshop organisers, and editors of the proceedings

Marcus Foth
Principal Research Fellow, Queensland University of Technology, Brisbane, Australia

Laura Forlano
Kauffman Fellow in Law
Yale Law School, New Haven, USA

Hiromitsu Hattori
Assistant Professor
Department of Social Informatics, Kyoto University, Japan

Digital Cities 6

Penn State University, University Park, PA, 24th June 2009

Time	Chairs / Presenters	Affiliation	Title
Chairs:	Marcus Foth	Queensland University of Technology, AU	
	Laura Forlano	Yale Law School, New Haven, US	
	Hiromitsu Hattori	Social Informatics, Kyoto University, JP	
09.00 - 09.30			**WELCOME AND INTRODUCTION**
09.30 - 09.45	de Waal, Martijn	University of Groningen, NL	The Urban Ideals of Location Based Media
09.50 - 10.05	Fritsch, Jonas, & Brynskov, Martin	Aarhus University, DK	Between Engagement and Information: Experimental Urban Media in the Climate Change Debate
10.10 - 10.25	DiSalvo, Carl, & Lukens, Jonathan	Georgia Institute of Technology, US	Seeing the City Through Machines: Non-Anthropocentric Design and Youth Robotics
10.25 - 10.45			**MORNING TEA**
10.45 - 11.00	Forlano, Laura	Yale Law School, New Haven, US	Building the Open Source City: Changing Work Environments for Collaboration and Innovation
11.05 - 11.20	McCarthy, Joe	Strands Labs Seattle, US	Ambient Informatics in Urban Cafés
11.25 - 11.40	Foth, Marcus	Queensland University of Technology, AU	Urban Futures: A Performance based Approach to Residential Design
11.45 - 12.00	Fuller, Gillian, & Harley, Ross	University of New South Wales, AU	Contactless Contact: Reconceptualising Radio and Architecture in the Wireless City
12.00 - 01.00			**LUNCH**
01.00 - 02.00			**KEYNOTE: CARLO RATTI, SENSEABLE CITY LAB, MIT**
02.05 - 02.20	Ojala, Timo, & Kukka, Hannu	University of Oulu, FI	A Digital City Needs Open Pervasive Computing Infrastructure
02.25 - 02.40	Halegoua, Germaine	University of Wisconsin-Madison, US	The Export of Ubiquitous Place: Investigating South Korean U-cities
02.45 - 03.00	Wong, Andrew	Telenor Research and Innovation, MY	Mobile Interactions as Social Machines: Young Urban Poor at Play in Bangladesh
03.05 - 03.20	Kirwan, Christopher Mustafa, & Travis, Sven	Parsons The New School for Design, US	UAE Urban Identities: Bridging Past Cultural Legacies with Emerging Urban Landscapes
03.20 - 03.40			**AFTERNOON TEA**
03.40 - 05.00			**PLENARY DISCUSSION: Concepts, Methods and Systems of Urban Informatics**

Digital Cities 6: Concepts, Methods and Systems of Urban Informatics

4th International Conference on Communities and Technologies, Penn State, USA, 25 June 2009

Marcus Foth

Senior Research Fellow, Queensland University of Technology, Brisbane, Australia, m.foth@qut.edu.au

Laura Forlano

Kauffman Fellow in Law, Yale Law School, New Haven, USA, laura.forlano@yale.edu

Hiromitsu Hattori

Assistant Professor, Department of Social Informatics, Kyoto University, Japan, hatto@i.kyoto-u.ac.jp

1   Theme

Transport grids, building complexes, information and communication technology, social networks and people form the bones, organs, muscles, nerves and cell tissue of a city. Studying the organisation and structure of these systems may seem straightforward at first, since there are visible artifacts and tangible objects that we can observe and examine. We can count the number of cars on the road, the number of apartments in a building, the number of emails on our computer screens and the number of profiles on social networking sites. We could also qualify these observations by recording the make and model of cars, the size and price of apartments, the sender and recipient of emails and the content and popularity of online profiles. This approach would potentially produce a large amount of data and render a detailed map of various levels of a city's infrastructure, but a large quantity of detail does not necessarily result in a great quality (and clarity) of meaning. How do we analyse this data to better understand the 'city' as an organism? How do the cells of the city cluster to form tissue and organs, and how do various systems communicate and interact with each other? And, recognising that we ourselves are cells living in cities as active agents, how do we evaluate the effectiveness and efficiency of the processes we observe in order to plan, design and develop more livable cities?

A macroscopic perspective of urban anatomy does not easily reveal those meticulous details which are necessary to help us understand and appreciate what Anthony Townsend calls the *urban metabolism* (Townsend, 2000), that is, the nutrients, capacities, processes and pace which nurture the city to keep it alive. Some of the fascination with human anatomy stems from the fact that a living body is more than the sum of its parts. Similarly, the city is more than the sum of its physical elements. Trying to get to the bottom of a city's existence, urban anatomists have to become dissectors of urban infrastructure by trying to microscopically uncover the connections and interrelationships of city elements. Yet, this is anything but trivial for at least three reasons. First, time is a crucial factor. Many events that trigger urban processes involving multiple systems result in a timely interrelated response. A dissection by isolating one system from another, would cut the communication link between them and jeopardise the study of the wider process. The city comprises many of these real-time systems and requires approaches and tools to conduct real-time examinations. Second, the physical city is increasingly complemented with a virtual layer that digitally augments and enhances urban infrastructures by means of information and communication technology including mobile and wireless networks. This world, which Mitchell (1995) called the 'city of bits,' is invisible to the human eye, and we require instruments for live surgery to render the invisible visible. Third and most

importantly, the 'cells' of the urban body, the lifeblood of cities, are the city dwellers who have a life of their own and who introduce human fuzziness and socio-cultural variables to the study of the city. The toolbox of what could be termed anthropological urban anatomy thus calls for research approaches that can differentiate (and break apart) a universally applicable model of 'The City' by being sensitive to individual circumstances, local characteristics and socio-cultural contexts.

Exploring these three challenges, this workshop looks at concepts, research methods and instruments that become the microscope of urban anatomy. We want to discuss urban informatics systems that provide real-time tools for examining the real-time city, to picture the invisible and to zoom into a fine-grained resolution of urban environments that reveal the depth and contextual nuances of urban metabolism processes at work.

2   Topics

Relevant workshop topics include but are not limited to the following:

- Civic and community engagement strategies to support urban planning

- Public sphere, participation and online deliberation systems

- Urban e-government, e-governance, e-participation, e-democracy approaches

- u-City: Ubiquitous computing, pervasive technology, wireless internet and mobile applications

- Locative media, navigation and space

- Urban informatics design and development methods and epistemologies

- Multi-format user-generated content (narratives, photos, videos, multimedia)

- Neogeography and 3D virtual environments for urban design and planning

- Simulations to reproduce and analyse complex social phenomena and city systems

- Social networking, collective intelligence and crowd sourcing in the urban context

- Environmental, economic and social sustainability

- Citizen science

- Access, trust, privacy, safety and surveillance

- Implications for residential architecture and the design of cities and public spaces

- Ethical considerations scrutinizing the assumptions behind urban informatics

3   Organisation and Submission Details

This is a full day workshop. We will start off with a keynote address by an eminent speaker. Rather than formal conference-style paper presentations, we will follow the successful peer interview format and ask each participant to interview another contributing author. Pairs will be assigned in advance to prepare questions and engage with the paper. After lunch, there will be a range of group activities and a closing plenary discussion at the end. The workshop can accommodate a maximum number of between 25 to 30

participants including presenters in order to provide an environment that is conducive to debate and interaction.

We are interested in three types of contributions:

- **Concepts**: Essay style papers discussing theoretical and conceptual ideas and innovation within a cross-disciplinary framework.

- **Methods**: Papers reporting on novel approaches in the area of urban informatics, e.g. network action research, shared visual ethnography, urban probes, cross-disciplinary methods, etc.

- **Systems**: Reports of systems and case studies that ground findings in practice and experience.

Prospective participants are asked to submit a position paper (2-4 pages total, in English, ACM SIGCHI 2-column format, same as the C&T full papers) related to one of the workshop topics. Each submission should also include a short biography stating the author's background and motivation for attending the workshop. Workshop position papers are due on April 16th, 2009 and will be reviewed and selected by the organisers with the support from an international program committee. Accepted authors will be notified by May 18th, 2009 – to leave enough time to qualify for the early bird conference registration. The acceptance of a workshop position paper implies that at least one of the authors will register for both the workshop and the Communities & Technologies 2009 conference. The workshop takes place on June 25th, 2009. After the workshop, selected contributors are invited to submit a full paper by October 1st, 2009. Full papers will undergo double blind peer review before being published. Arrangements for en edited book or a special issue of a relevant international journal are currently underway.

4   Bibliography

Each Digital Cities workshop has produced an edited volume containing selected workshop papers and other invited contributions as follows:

Digital Cities 5
Foth, M. (Ed.) (2009). *Handbook of Research on Urban Informatics: The Practice and Promise of the Real-Time City*. Hershey, PA: Information Science Reference, IGI Global.

Digital Cities 4
Aurigi, A., & De Cindio, F. (Eds.). (2008). *Augmented Urban Spaces: Articulating the Physical and Electronic City.* Aldershot, UK: Ashgate.

Digital Cities 3
van den Besselaar, P., & Koizumi, S. (Eds.). (2005). *Digital Cities 3: Information Technologies for Social Capital* (Lecture Notes in Computer Science No. 3081). Heidelberg, Germany: Springer.

Digital Cities 2
Tanabe, M., van den Besselaar, P., & Ishida, T. (Eds.). (2002). *Digital Cities 2: Computational and Sociological Approaches* (Lecture Notes in Computer Science No. 2362). Heidelberg, Germany: Springer.

Digital Cities 1
Ishida, T., & Isbister, K. (Eds.). (2000). *Digital Cities: Technologies, Experiences, and Future Perspectives* (Lecture Notes in Computer Science No. 1765). Heidelberg, Germany: Springer.

The Urban Ideals of Location Based Media

Martijn de Waal
University of Groningen
5 Adams Street
Brookline MA 02446
+1 617 229 9289

mw@dds.nl

1. Bio

Martijn de Waal is a researcher and writer connected to the department of practical philosophy at the University of Groningen, where he is part of the New Media, Public Sphere and Urban Culture research project, headed by prof. René Boomkens. He is also connected to the department of media studies at the University of Amsterdam. In the spring of 2009 he is a visiting scholar at MIT's Medialab and the Comparative Media Studies program in Cambridge, MA. With Michiel de Lange he initiated TheMobileCity.nl, a conference and weblog on new media, urban culture and identity, organized in collaboration with the Netherlands Architecture Institute. Currently he is researching a new edition of The Mobile City conference to be held in 2010. He is also working on a dissertation on new media and urban culture as well as working on a series of articles for several edited volumes. His most recent publications include Martijn de Waal 'From BLVD-Urbanism to MSN-Urbanism' in *Mediacity: Situations, Practices and Encounters* Frank Eckardt, Jens Geelhaar & Laura Colini a.o. ed. Frank & Timme Verlag Berlin and Martijn de Waal 'Locative media and the city: from BLVD-urbanism towards MySpace urbanism' in *Receiver* #21 *Space is the Place*

2. Motivation

One of the reasons why I founded The Mobile City conference and weblog in The Netherlands is the realization that locative and mobile media (or 'urban informatics') have started to play an increasingly constitutive role in the formation and experience of our cities. At the same time, the discourse on these new technologies and their roles in urban culture seemed to be dispersed through different disciplines, each with their own frameworks and latent ideas of what a city is and how it should function. Remarkably, at least in the Netherlands, the disciplines of architecture and city planning had only marginally picked up on these discussions. Most discourses in professional planning still conceptualize the city as a pure physical, spatial territory (although this has started to change recently).

The goal of The Mobile City was to bring together the different disciplines– including architecture and planning – that take (or should take) issue with what has elsewhere been called 'urban informatics' and see if we could start shaping some communal set of concepts - neither as a utopian celebration nor as a dismissing, dissociated critique - that could be the base of a new set of design principles. Our main questions thus were first, from a theoretical point of view, what are useful concepts to talk about the blurring/merging of physical and digital spaces? Second, from a critical perspective, what does the emergence of locative and mobile media mean for urban culture, citizenship, and identities? And third from a pragmatic point of view, what does all this mean for the work of urban professionals (architects, designers, planners), media designers, and academics?

I think the inter-discipline of Urban Informatics finds itself at an interesting point in time. For instance, within the domain of locative media – while there is a lot of commercial, artistic and scientific interest, the use of locative media hasn't crystallized into clearly recognizable cultural practices yet. Now is a good time to learn from both macroscopic and microscopic (academic) approaches and try to see if indeed we can connect these findings with a larger debate about and conceptualizations of urban culture. I have found the contribution of Williams, Robles and Dourish to the Urban Informatics handbook a very interesting starting point for this discussion. And it is to that debate that I hope to contribute at the Digital Cities 6 workshop, whose outcomes I also hope to disseminate through The Mobile City weblog and the upcoming The Mobile City conference in The Netherlands.

3. Discussion Paper: The Urban Ideals of Location Based Media[1]

Over the last decade, a new set of technologies has emerged that may very well change the way in which we experience the city and appropriate urban space. These technologies - and their discourses - range from 'ubiquitous computing' to 'locative media' and from 'ambient intelligence' to 'the internet of things' and 'urban informatics', and differ in their origin and deployment. Yet they have one important feature in common: these 'location based media' – the catchall term that I will use here - do no longer adhere to the anything-anytime-anywhere-paradigm of the 1990s. Rather they are centered around location sensing capacities and aim to make a specific here-and-now relevant for their users.

---

[1] An adapted version of this article will be published later this year in a catalogue accompanying an exhibition on locative media art in Vienna, Austria. I would like to discuss its content on the digital cities 6 workshop and would also be willing to transform it together with comments taken at the workshop to a new article for the DC6 proceedings.

As Mark Tuters and Kazys Varnelis have pointed out, two main characteristic affordances enable this shift from 'placelessness' to 'situatedness'. One is the capacity to annotate places, 'virtually tagging the world'. The other affordance has a phenomenological quality that enables 'tracing the action of the subject in the world.' [5] On the one hand, location based media allow connecting actual places with descriptions and databases, ranging from personal memory to commercial coupons. On the other hand location based media allow the tracking of persons and things through space. Both instances can work on a personal and on a communal, aggregate level. The tagging of places and tracing of persons and objects also create new fields of metadata about these places and persons that can consequently be used to search, filter 'discover' or connect these places and people.

Although this formal definition is very useful as a barebones starting point for thinking about location based media in general, it does not say anything about the actual goals and uses of the protocols of tracking, filtering and annotating. So what does this development of location based media mean for practices of place-making? If we indeed start to experience the city and our interaction with our surroundings through these technologies, then who exactly is shaping these technologies and to what purpose? What normative ideas of what a city is, are used as a starting point for the design of these location based media? What alternative ideas of urban culture and place making could also be used? Different disciplines have taken on different ways of approaching Location Based Media, and work from different latent ideas of what a city is, resulting in varying design principles or discourses of critique. At the Digital Cities 6 workshop I would be interested in scrutinizing these latent urban ideals. [2] Here I will focus on two – often left implicit - framings of the city. The first I will call U-City, the second U-Citizen, and although they seem to be oppositional conceptualizations of what a city is, I will argue that an approach that allows for a combination of these two design principles could also be an interesting alternative.

A perspective often found in the commercial domain is the idea of what has been labeled – by the Korean Government - 'U-City', an abbreviation for 'Ubiquitous City'. In the *Handbook on Urban Informatics* Jong–Sung Hwang describes how the Korean government sees the advent of ubiquitous computing in the city as a spearhead for both the development of national technology firms and research centers as well as an improvement for the quality of urban life. The policy behind 'U-city' perceives the city as a collection of infrastructural services geared towards citizen-consumers. The deployment of ubiquitous computing and location based media centers on the development of a toolkit that makes urban life more efficient, and helps individual consumers to customize the city in their own image. In his article Jong-Sung gives many examples of this approach: roads that know how many cars drive on them linked to systems of traffic flow regulation, tires that give off warnings when the pressure is too low, and

[2] See also Amanda Williams, Erica Robles, Paul Dourish Urbane-ing the City: Examining and Refining the Assumptions Behind Urban Informatics in Foth ed. Handbook of Research on Urban Informatics (New York 2009)

personalized services like receiving a message when your children have arrived safely at school. The author calls this the idea of 'The City as a Service'.

There has been a lot of criticism on the approach of urban culture as a system of infrastructural services. Stephen Graham and Simon Marvin for instance have related this idea to a process of 'splintering urbanism'. In the modernist city, they state, universal access to infrastructure networks such as the AC grid or the road system was the (latent) urban ideal. These infrastructure networks integrated all citizens into one and the same technological system. At the beginning of the 21st century, utilities and infrastructure are no longer seen as public services equally accessible for all, but rather as marketable commodities sold to specific consumer groups. Graham and Marvin give the example of a toll way fee that automatically adapts to the demand: the busier the traffic, the higher the toll. This process, they claim, is part of a broader neo-liberal economic trend. Privatization of public companies plays a large role in this process, as does modern computer technology which makes it now possible to set up 'pay per mile' high way systems, or complicated tariff structures. These technological systems might make the city more efficient, or tailored to individuals, they also address their users different. Whereas the modern infrastructure addresses its users as equal citizens, these personalized infrastructural services address them as 'individual customers.' This could create new forms of inequality, and even a shift in the relation between citizens and the city. Do people still see themselves as citizens – with all the rights and duties involved? Or do they start to think of themselves as customers – which sets up a different relation between user and owner of the system as well as between users. Whereas such criticism is valuable and could point to inequalities that are being created in the way technologies are appropriated, I find some of these criticisms also stall the debate. They seem to be foremost a criticism of the economic system through which these technologies are appropriated and consequently overlook opportunities. Could not these same technologies also help to distribute scarce resources (such as mobility) more fairly and efficiently, for instance by providing every citizen with an equal number of 'mobility points' that can be spend on dynamically priced services?

The 'u-city' approach that focuses on personalization of urban services and infrastructures could also improve the quality of urban life or even empower certain groups of citizens. Take for instance the approach – found in the same *Handbook on Urban Informatics* – taken by MIT's Senseable City WikiCity project. These researchers bet on a future in which real time data about the city can be coupled with a semantic toolset, so you can as ask your 'urban informatics'-device questions like 'what is the best place – with regard to my current location, weather forecast, environmental conditions and other factors - to fly a kite today? Now that may seem like a somewhat trivial affair, but of course this depends on the sort of questions through which you can personalize the city. Change the questions, and the U-city approach may even empower new groups. Over the last few years, reports have surfaced about African farmers who receive market prices at different locations for their produce by SMS and so are able to negotiate better prices. Small shopkeepers – again in Africa - order their supplies by SMS rather than driving to bigger cities, or use the phone to schedule appointments with clients.

People who work in the informal or semi-formal economies can organize their life and use of the city more efficiently and increase their knowledge of social processes and market conditions.

Even though a 'U-city' approach could empower and improve the quality of life, it is also being critiqued for its rational and functionalist approach of the city. The city is conceptualized as a collection of infrastructures to be managed efficiently. What is lost in this latent urban ideal is the notion of the city as a cultural system. What makes a city interesting is the very unpredictability and serendipity that – in its most extreme form – the 'U-city'-paradigm tries to rule out. Where U-city focuses on rationality, Cartesian mapping and efficiency, this critique tries to emphasize the subjective experiences of the city and the idea of the city as a meaningful community of people. Many projects in this category frame the city from the perspective of the citizen rather than a consumer of services, hence in contrast I've called this stance U-citizen.

On the centennial celebration of the Futurist Manifesto, American researcher Eric Paulos published the *Manifesto of Open Disruption and Participation* that made the cause for such a conceptualization of urban culture: 'What really matters? Everyday life spans a wide range of emotions and experiences – from moments of productivity and efficiency to play, reflection, and curiosity .... we claim that the successful ubiquitous computing tools, the one we really want to cohabitate with, will be those that incorporate the full range of life experiences. We want our tools to sing of not just productivity but of our love of curiosity, the joy of wonderment, and the freshness of the unknown.' [3]

In the domain of locative media art we have seen a number of experiments that match Paulos' call.

Over the last few years there have been a number of projects, mainly employing the annotative affordance of location based media, that try to open up or augment the experience of city space in many different ways. Many of these are inspired by the 1960s movement Situationist International.[1] This group of artists centered around Guy Debord wanted to counter the rationalist city models tailored to the consumerist logic of the 'society of spectacle' with an approach that centered on the subjective experience of the city and included areas and experiences that were marginalized in the dominant way of thinking about urban culture.

Another set of annotative projects try to open up the experiences of the city by allowing the mark-up of city space with subjective experiences. There is a whole range of these geo-annotation projects, the one most often quoted is Urban Tapestries by Proboscis. Urban Tapestries lets its participants annotate urban space with their memories, histories and experiences. The annotated map is also a collective interface through which these stories can be shared and exchanged. In an interview with Ann Galloway, Proboscis-investigator Giles Lane explained that the project was started in a reaction to the consumer-centered approach of most location based media projects. As Proboscis has put in on their own website (with another reference to a historic urbanist movement):

'Like the founders of Mass Observation in the 1930s, we were interested in creating opportunities for an "anthropology of ourselves" – adopting and adapting new and emerging technologies for creating and sharing everyday knowledge and experience; building up organic, collective memories that trace and embellish different kinds of relationships across places, time and communities.' [2]

As Paul Dourish a.o. have shown, many of these annotative projects are based on the idea of the city as a site that is 'simultaneously dense and isolating', an insight that can be traced back to early twentieth century sociologists like Georg Simmel or Robert Park. Urban culture is understood as a 'dense ecology of strangers', an experience that can be at once liberating and alienating. [6] What some of these projects aim at is to use geo-annotation to bring about or restore a sense of communal experiences within this urban condition.

In an article in the Leonardo Electronic Almanac Lily Shirvanee expects that the sharing of experiences through locative media could lead to what she has called 'social viscosity'. The stories collected could work as crystallization points for (imagined) communities or starting points for processes of exchange, deliberation or contestation. 'This viscosity of space is perceived as a bond that may exist not only between people with established relationships who can find each other 'on the street' in a mobile context, but also between strangers, thereby inspiring a new community and, possibly, creating the potential for a more democratized public space.'[4]

Like Lane, Shirvanee sees this approach as an alternative to the commercial consumerist strategies: 'As these mobile social artifacts grow, it will be important to discover if the optimism and the efforts of connecting society can override banal social spam and surveillance.' The idea of urban culture that is present in these projects focuses on community and cultural exchange rather than on economics and efficiency.

These U-citizen-projects have their own critics. It is not so much the playfulness of many of these projects itself that lies under attack, but rather the noncommittal character of these interventions. Their duration is often short, their audience a small self-selected crowd and only seldom is there a follow-up that might turn these art projects in a more sustainable addition to the experience of the city.

There are some projects that have succeeded in combining the two latent ideas of the city. For instance, Eric Paulos' call for citizen science projects, or Usman Haque's Pachube[3] seem to have the potential to have a meaningful impact on the way we experience our cities. They both provide the opportunity to personalize 'urban services', while at the same time provide ways for communities to interact, connect, collaborate and produce collective knowledge that can be useful in appropriating or gaining control over their local places.

---

[1] [3] http://www.pachube.com/

[1] Dimitris Charitos, Olga Paraskevopoulou, Charalampos Rizopoulos 'Location-specific art practices that challenge the traditional conception of mapping' *Artnodes* Issue 8 2008

[2] Ann Galloway A Brief History of the Future of Urban Computing and Locative Media (PhD Thesis, 2008)

[3] Eric Paulos Manifesto of Open Disruption and Participation http://www.paulos.net/papers/2009/manifesto2009.html 2009

[4] Lily Shirvanee Shirvanee, Locative Viscosity: Traces Of Social Histories In Public Space. *Leonardo Electronic Almanac* (2006).

[5] Marc Tuters and Kazys Varnelis Beyond Locative Media (2006) http://networkedpublics.org/locative_media/beyond_locative_media

[6] Amanda Williams, Erica Robles, Paul Dourish Urbane-ing the City: Examining and Refining the Assumptions Behind Urban Informatics in: Marcus Foth Handbook of Research on Urban Informatics: The practice and Promise of the Real-Time City (Information Science Reference, Hershey, New York, London, 2009)

Between Engagement and Information:
Experimental Urban Media in the Climate Change Debate

Jonas Fritsch & Martin Brynskov
Center for Digital Urban Living
Dept. of Information and Media Studies
Aarhus University, Denmark

imvjf@hum.au.dk, brynskov@imv.au.dk

ABSTRACT

This paper discusses the initial findings from a dual case study, describing two interactive urban installations in the city of Aarhus reflecting on their design and use. The two installations are *Climate on the Wall*, an interactive media façade, and *CO2nfession/ CO2mmitment*, a video installation with user-generated content. Both were designed to contribute to the effort of making people in the city aware of the municipal's goal of becoming CO2 neutral by the year 2030. They were designed as part of a larger exhibition to engage individual citizens in a concrete way towards the somewhat more abstract end of CO2 neutrality. In the paper we present the background for the work, describe the installations, report on initial findings regarding their use and reception, and, finally, outline what research agendas to pursue in future work.

Keywords

Interaction design, media façades, interactive video installations, civic communication, digital urban living

1. INTRODUCTION

The present work is a result of experiments with interactive urban installations carried out by the Center for Digital Urban Living (DUL) [1], a national research center located in Aarhus, Denmark. The concrete subject is a dual case study with two interactive urban installations: *Climate on the Wall*, an interactive media façade, and *CO2nfession/CO2mmitment*, a video installation with user-generated content.

During the last couple of years, a focal point for several people now working together at DUL has been to investigate the properties and qualities of urban scale interactive systems, e.g. media façades, mobile and pervasive games, interactive museum exhibitions and digital urban art. Since DUL was founded in 2008, two of the four groups have in particular been working with large-scale experimental systems, i.e. the Media Façades group and the Civic Communication group. The research strategies include material studies and small-scale experimental systems as well as large-scale production quality systems with external partners. Since real-world deployment and interventions are a crucial component in understanding how new systems work, DUL continues to look for opportunities to expand knowledge in that domain.

Most often, the focus has been on form rather than content. Much of the experimentation, at least with the larger systems, has been done within a context that is already given to some extent. E.g., *Aarhus by Light* [2] – a 180 m^2 interactive media facade at Concert Hall Aarhus – was an experiment in social interaction set in the context of a very specific location (the concert hall park), in-

volving a specific building (the concert hall), and addressing the various groups of people inhabiting and passing by that space at certain times. The Concert Hall management had accepted to become involved in the project, but they did not give any specific directions in relation to providing content. In the end, it can be argued that the whole conceptual and interactional paradigm was created by the design team to learn something about the *medium*, i.e. the qualities and properties of large interactive urban system, rather than focusing on content.

A prominent research trajectory has therefore emerged using the initial research findings considering the form of the systems to more thoroughly address the production and reception of a given content, which might be framed as an investigation of the relation between *engagement* and *information*. Inherent in this investigation is the question of how it is possible to design large-scale interactive urban systems that can spur concrete actions from the users in relation to a given subject. Another question concerns content-production from the users as a possible way to sustain user interest in the interactive installations over time.

When the municipality of Aarhus, which is a partner in DUL, was planning an exhibition on climate changes in the world, it was natural to turn it into a testbed for two interactive urban installations aimed at getting people engaged actively on a personal level in the struggle for a better climate in Aarhus. In this paper, we first describe the conceptual thoughts behind and the actual design of the two installations. This is followed by a preliminary evaluation of the installations based on observations and interviews focusing on engagement and information. Finally, future research agendas are presented in light of this evaluation.

2. DESIGN CASES

The City of Aarhus has an ambitious goal: It wants to be CO2 neutral by the year 2030. To meet that challenge, the municipality needs to engage citizens on an individual level to make a difference by reducing his or her emission of CO2. This has led to an ambitious strategic venture aimed at addressing every citizen throughout various initiatives in the city. One such initiative was a large exhibition, *CO2030*, held in conjunction with the international *Beyond Kyoto* conference, which had more than 1500 attendees and a list of prominent international keynote speakers.

The general purpose of the *CO2030* exhibition was to create an opportunity for the citizens of Aarhus to meet up and get inspiration and good advice on how to decrease their emission of CO2. As part of attracting people to the exhibition, and to put real citizen faces on the fight for a better climate, DUL was invited to contribute to the exhibition. The result was two interactive instal-

lations running for the four days of the exhibition: *Climate on the Wall*, an interactive media façade where people could write their climate slogans with speech bubbles on the wall of the exhibition building and *CO2nfesssion/CO2mmitment,* a video booth where people could tell about their bad climate habits and also commit themselves to a more active fight for the climate. The videos were then broadcast at various locations around the city on screens embedded in bus stops and poster stands. The main event of the exhibition was an interactive game, the *CO2030 Game* [3], developed by a design company to highlight, challenge, and inspire the players' lifestyle with regard to their climate footprints.

2.1 Climate on the Wall

Climate on the Wall functioned as an interactive generator of climate statements using *Ridehuset* – home to the *CO2030 exhibition* and a prominent building in the city centre – as a backdrop. The installation used the façade of Ridehuset, as a display by means of projection technology involving two interlaced projectors placed in small towers built for the occasion.

Figure 1 - *Climate on the Wall***, street-view**

On the façade, a number of words relating to carbon emissions and climate issues floated around above the heads of passers-by. Some of the words were emphasized to form a statement about climate change. As people approached or walked past, the words pulsated and attracted attention. If a person stopped, the word above the person would grow and turn into a speech bubble. This word could now be dragged to a different part of the facade. In this way, people were able to create and manipulate sentences relating to climate change. The concept borrows from fridge magnets that can be arranged to form statements and sentences.
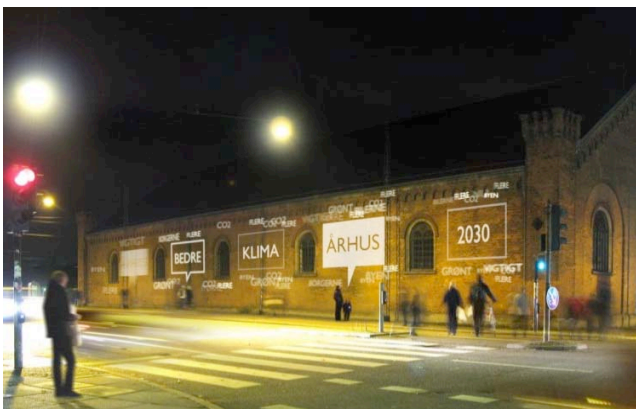

Figure 2 – A conceptual visualization of *Climate on the Wall*

During the exhibition, the installation was only accessible at night due to the projections. It attracted a great amount of attention, and engaged a variety of people in playful interaction with the interactive façade. People started sharing thoughts on the climate situation, and in general the installation spurred a great deal of conversations about both the exhibition and the theme of carbon emission. People were easily attracted to *Climate on the Wall* and the messages projected on the wall were primarily of a simple and straightforward character.

2.2 CO2nfession/CO2mmitment

CO2nfession/CO2mmitment was an advanced video installation developed by DUL in partnership with AFA JCDecaux and the Municipality of Aarhus. It served to put a personal face on the struggle for climate improvements and gave the citizens of Aarhus a voice to be heard – and seen – throughout the city.

Figure 2 - The *CO2nfession***-booth**

The installation itself consisted of two parts; one inside the exhibition space (Ridehuset), and the other on info stands and bus stops throughout the city. In Ridehuset, people could enter a booth, where it was possible to confess ones' climate sins (using too much water or electricity, eating too much red meat, driving too much etc.) and to commit oneself to a more active fight for a better climate in Aarhus. In the booth, a number of props served as an inspiration to creatively convey the climate story people wanted to tell. A video recorded people's confessions/commitments in the booth and they were shown as a live-feed outside the booth to attract bystanders.

The video was edited the same day and distributed on the screens in the city. People at these screens could hear the sound of the videos by pushing a sensor on the screens. The installation thus tried to render the fight for a better climate personal and immediately relevant to the people of Aarhus in the cityscape while at the same time attracting people to Ridehuset for the exhibition.

During the exhibition, 68 recordings were made and distributed around the city. A wide range of people used the installation, from people just visiting the exhibition who found a good opportunity to get something off their chest to the city mayor. The videos recorded were extremely diverse ranging from straightforward and simple confessions, to complex animated narratives using the props in creative ways. The latter were especially successful in attracting children to the booth, although only recordings with people above the age of 18 were distributed in the city. As for the

screens in the city, a number of people remarked their existence. Stories of people going to a certain screen to see themselves were reported, but also stories of people being surprised when suddenly seeing some of their friends appearing on the video screens. In general, although the screens created attention in the city, it nonetheless proved difficult to attract people to actively engage in exploring the content of the videos.

Figure 3 - *CO2nfession/CO2mmitment* **on a bus stop**

3. PRELIMINARY FINDINGS

We have a fairly broad range of data sources to analyze and evaluate the use and reception of the two installations, including 70 individual interviews with users, focus group interviews, observational video, photos of use and results (i.e. slogans on the wall and videos recorded in the booth). In addition to this is a rich documentation of the design process (e.g. inspirational material, technological experiments, and notes from meetings).

There are many aspects that could be investigated in detail from this large pool of data. Since both kinds of installations are non-standard systems, we have a general interest in observing how they are used and perceived, especially with regard to the context of the system (both socially, aesthetically, physically etc.). However, our more specific focus is on the tension between *engagement* on the one hand and *information* on the other, trying to understand the dynamics that lead to the initial engagement with the interactive setup and how this might translate into a possible long-term exploration of and contribution to the content provided by the installations.

The general reception of both systems was good, and they both seemed to engage people of all ages, although the age group 18-34 years is dominant. The vast majority knew or could guess the overall topic of the systems (climate change), and they generally expressed interest in climate change as a social responsibility. Many comments were made suggesting that people much preferred a communicative attitude based on motivation and realism (i.e. not too incompatible with everyday life) rather than dry facts and moral "preaching".

3.1 Climate on the Wall

Most users perceived the wall very positively, describing it with words like fun, exciting, engaging, and catchy. Most of them saw it for the first time, and they generally figured out how to use it by themselves, sparked by their (intentionally unavoidable) bodily interaction with the wall and drawing on expectations from the speech bubble metaphor; some did so by looking at others, and only very few never found out how it worked.

The typical usage time was a couple of minutes, and almost none remained spectators only. They usually did not try to write something specific, and while the majority found it too hard to write something that made sense, they commonly described the experience as fun. It was important for most users that they were active participants which they described as giving them a greater feeling of engagement and involvement. They also perceived this style of reaching out to citizens as a way of giving them a platform for engagement on a larger (societal) scale and a strong incentive to commit themselves in the climate debate. The interactive wall was generally used by people in groups who knew each other already. Only few instances of strangers talking to each other were recorded. However, the users described themselves quite or highly likely to tell others about the wall.

While this is preliminary data – and despite the fact that the interviews and observations may be biased in various ways due to the nature of the deployment "in the wild" – the overall impression is that the wall was in fact perceived as highly engaging and relevant as a civic platform in the public debate about climate change. However, it was not rated very high for its specific informative content or communicative functionality.

3.2 CO2nfession/CO2mmitment

Data from the use and reception of the CO2nfession/CO2mmitment (2CO2) installation covered both the "input" (the video booth) and the "output" (the embedded screens in the city). The video booth was located inside the exhibition building, and consequently, most of the users of the confession/commitment area were there in larger homogeneous groups because of lectures or events in connection to the exhibition and the CO2030 game. Apart from a few high-profiled events with local VIPs, the exhibition itself was not very sought when measured by people coming in from the street in comparison to previous exhibitions in the same space. This meant that the samples from these people varied less than was the case with the interactive wall.

68 confessions/commitments were recorded. Typical explanations from those who entered the booth included curiosity and peer pressure, and only one person mentioned the intention to increase the focus on the climate debate. There were mixed reactions to this kind of communication. While some felt that the personal exposure was warranted, or indeed needed, due to the urgency of the theme, others perceived the setup as negative, often because they did not find it interesting enough to engage in. It should be noted that these interviews were carried out before the booth had props in them, the introduction of which seemed to foster more creative use of the installation. A great number of people who did not enter the booth did engage in conversation with the people (designers) operating the installation, explaining why they would not enter and voicing their opinions outside the booth. In that respect, the installation spurred a great deal of interesting dialogues in the exhibition space which was not taped or recorded systematically.

The embedded screens were seen by many more due to their placement in busy city locations where they ran 24/7 for four days. Two-thirds of the interviewed people had activated the sound using the "Press for sound" button, and most of them found the volume appropriate. However, few of them could actually

remember the informational content of what was being said, either because the volume was not high enough to allow for comprehension, or because the content did not interest them enough to pay continuous attention. Most viewers did notice the changing persons, and they generally rated them as interesting. Although there were examples of people relating the situated character of the videos to both the specific settings they were displayed in as well as their own personal stories, in many ways the threshold for continued engagement and interaction seemed too high. At the bus stops, many were interrupted as the bus arrived, before spending more time with the installation. This also meant that quite a lot of interviews were not completed according to the interview guide.

Only few of the interviewees had tried or seen both the wall, the booth, and the screens. Those who had, felt that the wall was more "giving" due to the higher degree of anonymity. They also noted that the wall really stood out and was impossible not to notice, while the embedded screens (which came in two sizes) tended to blend in with the visual "noise" in the street.

4. FUTURE WORK
The initial findings highlight how difficult it is to perform strict evaluations of such large-scale interactive urban installations. Further, they also indicate that although the majority of the people that were interviewed generally appreciated the interactive installations, the appreciation was related more to the immediate and often playful engagement and not so much to the possibility to produce and consume information. Future analyses might indicate whether people in general were inspired to actually decrease their emission of CO2 inspired by the installations, and to what degree the use of the installations spurred a discussion of the themes or attracted people to go visit the exhibition.

Another study would be concerned with the temporal dynamics of the initial engagement and the long-term engagement through content-production. This trajectory would theoretically imply developing a nuanced vocabulary to address the relation between engagement and information, e.g. from pragmatist thinking or affect theory [2]. Of particular interest would be studies of the conditions of emergence for affective engagement offered by these urban interactive installations and how this might relate to a sustained attachment to the informational content provided.

The findings underline the way people actively appropriate and make sense of the installations in multiple, unforeseen ways. The openness of the installations proved to be an asset in engaging people creatively in playful interactions (*Climate on the Wall*) and modes of production and content-making (*CO2nfession/CO2mmitment*). It remains an open question how and to what degree one should balance between constrained and open-ended interactions in an urban environment. Nonetheless, our prior experience and the findings from this case study indicate that you neither can nor should try to fully control the environment and restrain people's active sensemaking, whether in terms of the interaction or regarding narratives. The openness of the system is an asset and can be actively pursued in the design process based on knowledge of the contexts of use and future users.

Summing up, we will argue that both the conceptual and practical design process leading to both *Climate on the Wall* and *CO2nfession/CO2mmitment* as well as the evaluative work done so far has been valuable in following the general research trajectory concerned with increasing the focus on content and information in the design of interactive urban systems. In the following months, the preliminary findings will feed into the design process for the international climate meeting in Copenhagen in December, COP15, where we hope to pursue the goal of creating urban interactions that engage people immediately in the exploration of a given installation or content, while also actively affecting people's everyday lives in positive ways.

ACKNOWLEDGMENTS

BIOGRAPHIES
Jonas Fritsch

MA in information studies specializing in interaction design and PhD fellow at the Department of Information and Media Studies, affiliated with Center for Digital Urban Living (DUL), working primarily on projects in the areas of Civic Communication and Media Façades. The subject of the thesis work revolves around developing affect theory as a theoretical foundation for conceptualizing and practically designing new, experimental urban interactions. Currently visiting researcher at Université de Montréal and Concordia University, Montréal, engaged in theory building and activist urban projects on the verge of interactive art and design.

E-mail: imvjf@hum.au.dk

Martin Brynskov

PhD (computer science) specializing in new interaction technologies. Director of the Civic Communication group within DUL and Assistant professor at the Department for Information and Media Studies at Aarhus University. During his doctoral work at the Center for Interactive Spaces, he developed tools for social construction based on mobile and pervasive media. He was the project lead of Aarhus by Light and has been involved in the development of numerous projects and products based on social interaction mediated by technology, working closely with public institutions and industrial partners, including LEGO Company and B&O. He also holds an MA in information studies, cognitive semiotics and classical Greek.

E-mail: brynskov@imv.au.dk

REFERENCES
[1] Brynskov et al. (2009). Accepted for *Interact 2009*, Uppsala, August 26-28, 2009. Cf. http://www.aarhusbylight.dk/index-english.html

[2] Dalsgaard, P. & Fritsch, J. (2008). Media Facades beyond Interaction. Position paper presented at the *Public and Situated Displays to Support Communities* workshop at *OZCHI'08*

[3] http://www.digitalurbanliving.dk

[4] http://www.co2030.dk/co2030-spillet

Seeing the City Through Machines: Non-Anthropocentric Design and Youth Robotics

Carl DiSalvo
School of Literature, Communication, and Culture
Georgia Institute of Technology
Atlanta, Georgia, 30332
carl.disalvo@lcc.gatech.edu

Jonathan Lukens
School of Literature, Communication, and Culture
Georgia Institute of Technology
Atlanta, Georgia, 30332
jlukens3@gatech.edu

ABSTRACT

In this paper we describe the motivation and theoretical grounding of a youth program that uses robotics to foster an understanding of the city as a system of human and nonhuman forces and interactions and to investigate urban infrastructure. We present non-anthropocentric design as a framing concept for our research and program development, provide an overview of this co-operative inquiry, and conclude by discussing the goals of the project.

Categories and Subject Descriptors

H.1.2 User/Machine Systems

General Terms

Design, Theory

Keywords

Robots, Cities, Nonhumans, Non-anthropocentric Design, Youth, Cooperative Inquiry

1. INTRODUCTION

Youth robotics programs overwhelmingly emphasize technical content; they are designed to teach the definitions and capabilities of components, such as sensors and actuators, and programming in the context of developing science, technology, engineering and math (STEM) knowledge. [9] As an alternative, we have developed a youth robotics program with a different perspective and agenda: the use of robotics as means of investigating urban infrastructure and fostering an understanding of the city as a system of human and nonhuman forces and interactions. This program takes its cue from recent projects in the arts and design [10,12] and is structured as a cooperative inquiry [15] between the authors and the youth participants. It is designed to explore the novel views of the urban environment robotics may provide, and the ways in which those views can be used to reveal and to question possible future relations between people, technology and the city.

A pilot of the youth robotics program we developed, "Seeing The City Through Machines", was run in late April 2009 and a full (two-week) version of the program will occur in mid-July 2009. In this paper, we present the motivation and theoretical grounding that directed the design of this program, along with a brief description of the program activities. Thus, this submission is both a concept essay presenting a theoretically informed perspective on design and design research in the digital city and a methods paper presenting a novel approach to urban computing with youth.

2. TAKING NONHUMANS SERIOUSLY

In "Seeing The City through Machines" youth use robotics to explore and document urban infrastructure. The decision to pair urban infrastructure with robotics was motivated by our interest in the roles of nonhumans in the constitution of the city. Over the past several decades, scholarship in science and technology studies (STS) [7,8] and philosophy [4] has drawn attention to the ways that a variety of things other than humans exert influence in the construction and maintenance of knowledge, being and experience. These nonhumans include animals, the built environment, tools and devices, software, hardware, protocols and networks, laws and legal and governmental procedures.

Although there are substantially differing perspectives and methods across this work, a common feature is a shift away from an anthropocentric perspective that privileges the individual human actor, towards a perspective that places the human as but one factor in a larger system of interactions. What is important in these interactions is not some ontological quality of any one factor, e.g., whether it is alive or not, but rather the ways in which the capabilities and limitations of all of the factors may work in concert or against one another in a given scenario, establishing and reconfiguring power relationships and capacities for action.

This shift away from an anthropocentric perspective has implications for design and design research. While nonhumans have taken a prominent role in the humanities and social sciences, human-centeredness has taken a prominent role in design. On the surface, these two perspectives seem to confound one another — by definition, nonhuman or non-anthropocentric perspectives de-center the human. What does it mean, and why would one want to de-center the human in design?

Our starting position is that a non-anthropocentric design would not negate or super cede the human. It would attempt to better account for nonhumans in design and design research in order to better to understand, describe and intervene in a given scenario. The human in a non-anthropocentric design does not disappear,

but becomes one among many factors. In shifting away from the psychological and sociological qualities of human activities and desires, a non-anthropocentric design broadens the conditions and issues of design and design research.

2.1   Why are nonhumans important to the design, design research and the digital city?

Why are nonhumans important to design and design research, and specifically to the digital city? This question is particularly warranted in the context of developing a youth robotics program, as its purpose is not to teach the STS or philosophy per se, but to enable the participants to develop new perspectives on technology and cities and to use technology to produce creative interpretations of the urban environment. We can address this question by examining the importance of nonhumans from both an applied and an ethical perspective.

From an *applied perspective*, it is important to attend to nonhumans because they are real forces in the urban environment that effect how that environment functions and changes: ignoring them or placing them at the periphery unrealistically bounds a design or engineering project and puts the project, and others, at risk. As one example of such nonhuman forces, consider the January 15, 2009 event in which a bird struck an airplane engine as the plane took-off from LaGuardia airport in New York, damaging the engine and necessitating an emergency landing. [11] In addition to animals, the inanimate things of urban infrastructure, such as roads, bridges, utility and data systems, also have consequences and exert influence. As another example, the suffering and devastation in New Orleans from hurricane Katrina was neither caused nor resolvable by any single human actor or group or organization, but rather a confluence of factors ranging from the weather to the material specifics of individual levees to flaws in emergency reporting and response procedures. [17,18]. Less dramatic, but still forceful in shaping capacities for action, are basic city forms such as curbs, stairs, potholes and reflective surfaces. In the context of robotics, such forms structure the capacity of robots to navigate the urban landscape: a two-inch offset between sections of sidewalk can be enough to thwart the advance of a mobile platform and brings to the fore the need to consider the material specificity of affordances and limitations that shape the embodiment between nonhuman entities.

In fact, nonhumans and their influence are acknowledged in many domains and practices of engineering and planning outside of the familiar domains and practices of human-centered design. For example, fly zones and preventative features have been developed to mitigate the danger of bird-strikes [5]; research is being conducted on the use of embedded sensors to monitor the damage and wear in bridge cables and beams [6]; and navigating the obstacles of the urban environment is recognized as being a "grand challenge" for robotics. [3] From an *applied perspective* then, shifting from a human-centered to a non-anthropocentric approach would broaden the research and design endeavors to include situational conditions that may impact human experience, but that are beyond the attribution of agency or responsibility to discrete human acts and desires.

From an *ethical perspective*, it is important to attend to nonhumans in order to avoid decision making, planning and design that serves human interests at the expense of other species. Modern history is replete with examples of urban planning, architecture, and industrial design projects that have had significant negative ecological effect. [13] Research suggests that

urban sprawl has been detrimental to wildlife by causing habitat loss through fragmentation and generalization, ultimately decreasing the diversity of the biomass. [2] The effects of digital environmental corollaries such as electro-magnetic fields on plants and animals in and around the city is unknown. Not surprisingly, nonhumans figure prominently in many ecological discourses. For example, in the discourses of deep ecology, anthropocentrism is often considered a cause of our contemporary ecological crisis. [14,16] A move towards a more astute recognition of nonhumans and the interplay between humans and nonhumans would be, from that perspective, a move towards a more sustainable society and future. From an *ethical perspective* then, shifting from a human-centered to a non-anthropocentric approach would draw heightened attention to the need to understand and account for the systemic effects of design across species and throughout the environment.

3.   SEEING THE CITY THROUGH MACHINES: PROGRAM DESCRIPTION

Motivated by this topic of the nonhuman and its intersection with design, technology and the city, we developed "Seeing The City Through Machines" program. The program will occur in partnership with the Boys and Girls Club of Atlanta, Youth Arts Connection (YAC), a specialized program within the Boys and Girls Club for high-school students who are interested in the arts which allows them to work with artists and arts educators. "Seeing The City Through Machines" will be piloted in late-April 2009 and run as a two-week program in mid-July 2009. The pilot program, described in the following paragraphs, is six to eight hours in length and is run over two days. There will be eight to ten participants ages 13-17, of mixed gender, all of whom have prior experience with using digital media for art and design projects. The program will take place in the YAC gallery/studio, which is located in downtown Atlanta.

In day one, the program begins with a general introduction to contemporary robotics. This introduction includes both technical content as well as a survey of contemporary robotic forms and functions. The technical content is presented as concepts that are constitutive of robotics — sensing, actuation, programming, telepresence, procedurality and embodiment — in order to enable the youth understand, in general terms, how robots work. Next, the youth are divided into two groups, and each group is given a remote controlled car equipped with a wireless night-vision camera and a separate receiver which routes its signal into a small video capture device attached to a laptop. After some brief experimentation with the robot (driving it around the studio) the program continues with a discussion on the subject of urban infrastructure, highlighting key terms and themes drawn from contemporary planning and geography and asks the youth to consider these terms and themes in the context of the city of Atlanta. The students are then tasked with using the remote controlled mobile camera platform in a scavenger hunt to search for and document (using the video camera) infrastructural items in the area surrounding the YAC gallery/studio, including natural gas pipes, gas and electric meters, electrical outlets, telephone cables, sewer access points, pay phones, emergency communication and fire alarm boxes.

The goal of the scavenger hunt is to engage youth in the identification of various components of urban infrastructure and to

provide an experience with a simple telepresent robot. The use of the mobile camera platform, rather than having the youth use digital cameras themselves is intended to prompt a situation of defamiliarization [1], in which the youth, through the odd sensory apparatus of the robot, see a familiar area through the perspective of an other, in this case, a nonhuman other. As the youth seek out the various components of urban infrastructure from the robots perspective, they will encounter obstacles and affordances of urban infrastructure to robotics, which will become the priming material for the day two activities.

In day two of the program, the youth will again divide into two groups use the telepresent robot to shoot two short videos (2-5 minutes), which will later be included in a photography exhibit at the YAC. The video explores the relationship between the capacities and limitations of the robot and those of the space and infrastructure in downtown Atlanta. To provide a starting point for the video, the youth are given a prompt:

Imagine that the robot can exist without you being around — it survives off of the infrastructure around YAC. Use your robot to create a video to show how the robot uses infrastructure around YAC to survive. For example, your video could show how it navigates the space, where it goes and where it can't go, what it senses and how it responds, where it gets power from and how it protects itself from the from the elements.

To facilitate the video production and narrative development, the youth will create storyboards and shot lists. Once these are completed and they have established a basic structure for their video, they will venture back out into the surrounding area to shoot the footage for the video, which will be edited into a final form by the youth using video editing facilities in YAC gallery/studio. During the final editing process, we will discuss as a group the ways in which the limitations and capabilities of the robot presented new views on urban environment, how the infrastructure of the city might support or hinder robots, and by way of conclusion, considering how robots in the city would affect our human experience and place in the urban environment.

The purpose of the video is for the youth to produce an artifact that synthesizes, in a creative way, what they have discovered about robotics and urban infrastructure, and the ways robotics and urban infrastructure might work with or against one another. Constraining the technology used in capturing the video footage as well as the dictating the space and subject of exploration is intended to direct the youth towards a high-level of specificity in their narrative synthesis. This specificity is important in identifying and attending to the distinctive material affordances and limitations that shape the embodiment of nonhuman entities to the fore. The youth cannot slip into generalities about robots and cities, but must address to *this* set of technical features and *these* qualities of *this* locale.

After the videos have been produced the youth will exhibit them as part of a photography exhibition at the YAC studio/gallery hosted in conjunction with another, separate, YAC program. This opportunity to display videos of the city taken from the perspective of a robot together with images taken by youth with traditional film and digital cameras and should prompt further conversations about technology and the city, and the ways in which different technologies provide different views and enable different creative interpretations of the urban environment. From

these conversations, we plan to develop with the youth activities and platforms for future programs.

4.   A COOPERATIVE INQUIRY TOWARDS WHAT ENDS?

"Seeing The City Through Machines" does not attempt to address all of the issues or concerns of attending to nonhumans or to fully articulate the city as a complex system of human and nonhuman forces and interactions. It serves as a prototype of the development of future youth robotics programs on these themes. Our goal in these programs is to investigate these issues and concerns together with the youth. We consider these programs a kind of cooperative inquiry. The "Seeing The City Through Machines" April 2009 pilot is the first stage of this inquiry, with plans to continue to work together with the youth through the Summer through subsequent stages of action and reflection. [15]

In addition to providing technology and arts experiences for the youth, this inquiry is directed towards two ends. First, we have developed this program to broaden participation in the discussion of possible future relations between people, technology and the city. Although there is a body of speculative art and design projects that propose alternate urban and technological futures, this is often the work of professionals and experts. By enabling the youth to participate in similar speculation, new topics, themes and desires will surface and be expressed and introduced into these discussions, amplifying the diversity of voices in our contemporary discourses of design. As researchers, our endeavor to make these voices heard is a significant challenge, and discovering, together with the youth, how to accomplish this, is another facet of this inquiry.

Secondarily, this program allows us re-think design through practice and in concert with others; in particular, to consider the implications and possibilities a non-anthropocentric design, a design that does not place the human at the center by default. By structuring the program so that the objective is to imagine the relations between robots and the city in the relative absence of human desires (i.e., by not asking "What would you want a robot to do for you?") we hope to enable non-anthropocentric design approach. As we continue this inquiry with youth at the YAC, our intention is to introduce the issues and concerns raised through both the applied and ethical perspectives into to the program activities. It is our hope that by accentuating the nonhuman factors in these activities, the youth will develop will develop new understandings of the relations between human and nonhuman forces and interactions that constitute the city, and new methods for accounting for these in future designs scenarios.

5.   Conclusion

What distinguishes "Seeing The City Through Machines" from other similar projects is its use of a robot as a creative medium through which to explore urban infrastructure and the relationships between the affordances and limitations of that infrastructure and robotics. A more common emphasis of such programs is imparting STEM knowledge. To frame this project, we introduced the notion of a non-anthropocentric approach to design.

6.   As designers and design researchers continue to work in the domain of the digital city, we believe that continuing to develop new strategies for this work and broadening our theoretical perspectives on the urban environment are important

endeavors. Drawing from the discourses of the nonhuman and considering what it might mean and why it might be of benefit to pursue a non-anthropocentric design is one course of action in pursuit of these endeavors. As the call-for-participation states: "this workshop looks at concepts, research methods and instruments that become the microscope of urban anatomy." Our contribution to this theme is to offer the robot as a particular kind of microscope, and to suggest that the anatomy under review is not a human anatomy alone.

7. ACKNOWLEDGMENTS

8. REFERENCES

[1] Bell B., Mark Blythe and Phoebe Sengers. Making by making strange: Defamiliarization and the design of domestic technologies. ACM Trans. Comput.-Hum. Interact., Vol. 12, No. 2. pp. 149-173, 2005.

[2] Benfield, F.K., Matthew D. Raimi and Donald D.T. Chen *Once There Were Greenfields: How Urban Sprawl is Undermining America's Environment, Economy, and Social Fabric.* New York: Natural Resources Defense Council. 1999.

[3] DARPA, Urban Challenge. http://www.darpa.mil/grandchallenge/index.asp Accessed April 15, 2009

[4] Deleuze, G., Felix Guattari, and Brian Massumi. *A Thousand Plateaus.* Minneapolis: University of Minnesota Press. 1987.

[5] Harris, R. E. and Rolph A. Davis. Evaluation of the efficacy of products and techniques for airport bird control. LGL Limited Environmental Research Associates, TP 13029. http://www.tc.gc.ca/publications/bil/TP13029/PDF/HR/TP13029B.pdf. Accessed April 15, 2009.

[6] Idriss, R. Testing and Monitoring of the I-10 Bridge using Fiberoptics, Report No. 99-01 to the Fedreal Highway Administration and the National Science Foundation Grant No. CSM-9522734, 1999.

[7] Latour. B. *Reassembling the Social: An Introduction to Actor-Network Theory.* Oxford: Oxford University Press. 2007.

[8] Law, J. Barbara Herrnstein Smith, and E. RoyWeintraub. *Aircraft Stories: Decentering the Object In Technoscience.* Durham: Duke University Press. 2002.

[9] Mataric, M. J. Robotics education for all ages. In *AAAI Spring Symposium on Accessible, Hands-on AI and Robotics Education*, Palo Alto, CA, March 22-24, 2004.

[10] Material Beliefs, *My Animat at My Space, My City, My World,* http://www.materialbeliefs.com/events/slc.php. Accessed April 15, 2009.

[11] Milmo. D. Bird strike on both engines in New York air crash 'a terrible coincidence. *Guardian UK Online*. Friday January 16, 2009. http://www.guardian.co.uk/world/2009/jan/16/ new-york-air-crash-bird-strike. Accessed April 15, 2009.

[12] Preemptive Media, *Zapped!*, http:///www.zapped-ti.net. Accessed April 15, 2009.

[13] Orr, D. *Earth In Mind: On Education, Environment and The Human Prospect.* Washington: Island Press. 1994.

[14] Plumwood, V. *Feminism and the Mastery of Nature*. London: Routledge. 1993

[15] Reason, P. *Participation in Human Inquiry*. London: Sage. 1995

[16] Routley, R. Human Chauvinism and Environmental Ethics, in *Environmental Philosophy* (eds) D.S. Mannison, M. McRobbie and R. Routley. Canberra: ANU Research School of Social Sciences: 96-189. 1980.

[17] United States Congress . A Failure of Initiative: Final Report of the Select Bipartisan Committee to Investigate the Preparation for and Response to Hurricane Katrina. Washington, DC: Government Printing Office. February 19, 2006) http://www.gpoaccess.gov/katrinareport/fullreport.pdf. Accessed April 15, 2009.

[18] Warrick, Joby; Grunwald, Michael. Investigators Link Levee Failures to Design Flaws. Washington Post. October 24, 2005. Accessed April 15, 2009.

Ambient Informatics
in Urban Cafés

Joseph F. McCarthy

Strands Labs
4143 University Way NE
Seattle WA 98105 USA
http://labs.strands.com/seattle

mccarthy@strands.com

ABSTRACT

The Community Collage (CoCollage) is designed to cultivate community in a café, a quintessential "third place", by bringing the richness of online social software into a physical community space. The system shows photos and quotes uploaded to a web site by café patrons and staff on a large computer display in the café, providing a new channel for awareness, interactions and relationships among people there. Much of the research into urban informatics focuses on digital representations of artifacts, processes and systems in a city. CoCollage offers a window into digital representations of city dwellers in the community-oriented places in which they regularly dwell.

Categories and Subject Descriptors

H.5.3 [**Information Interfaces and Presentation (e.g., HCI)**]: Group and Organization Interfaces – *Asynchronous interaction, Synchronous interaction*

General Terms

Design, Experimentation, Human Factors, Measurement.

Keywords

Place-based social networking, situated social software, public displays, community, third places, cafés, coffeehouses.

1. INTRODUCTION

Cafés are quintessential *third places*, "'homes away from home', where unrelated people relate" [7]. These local, accessible and inclusive "great, good places" act as staging grounds for cultivating the vital informal public life that is essential to all great cultures. They provide neutral spaces in which diverse people with divergent views can serendipitously encounter and engage with one another. In contrast to many online communities of interest, third places in the real world provide "the full spectrum of local humanity", creating opportunities for connecting with people with different interests, and for appreciating that other people can be interesting, in spite of – or perhaps because of – these differences. In addition to personal benefits, the "inclusive sociability" and "ease of association" offered in such places benefits the community by enabling people to discuss, plan and execute "potentially useful collective undertakings".

Although many cafés and coffeehouses are designed to encourage conversation and community, the growing proliferation of technology, especially laptops and mobile phones with wireless Internet access, is rendering many such places "physically inhabited but psychologically evacuated" [2]. Café patrons often use technology to tunnel out to their online social networks, while ignoring the physical community in which they are situated. Some cafés have responded by prophylactically disabling wireless Internet use on weekends.

The Community Collage ("CoCollage") is a new place-based social networking application designed to bridge the gaps between people in coffeehouses by bridging the gaps between the richness of their online interests and activities and their physical presence in a potentially "great, good place" [7]. CoCollage links online profiles, machine-readable loyalty cards and a large computer display that shows elements from those profiles when people use their loyalty cards in the café.

The CoCollage display, situated near the coffee bar, incrementally adds social media – digital photos and short text messages – to a dynamic collage (see Figure 1). Priority is given to media items associated with people who are physically present in the café, offering new channels of awareness and potential conversation-starting opportunities ("tickets to talk"). CoCollage is an example of *situated social software* [6], designed for use by a specific social group – and, in this case, a specific social setting – rather than for a generic set of users.
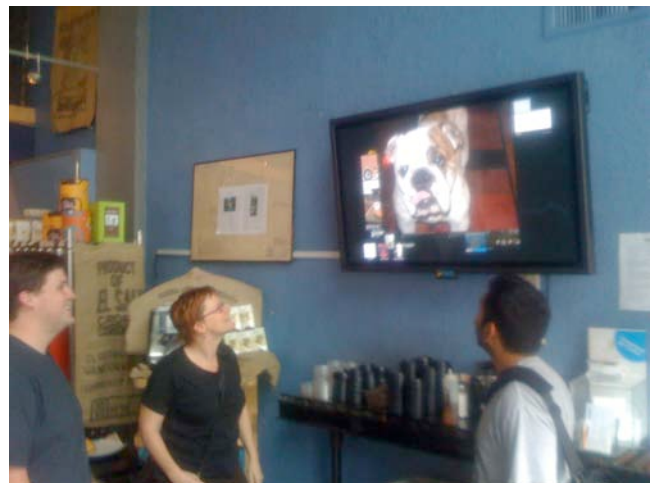

Figure 1: CoCollage display in an urban café.

CoCollage consists of a number of system components. Online profiles are created on the CoCollage web site, which enables users to upload, link to and share digital content – currently images and text – as well as vote and comment on others' content. The presence of users is established via an explicit "check-in" through the use of machine-readable loyalty cards or a button on a web page that is enabled only when the user's computer is connected to the wireless Internet router in the café. A visualization component shows a continuously updated collage of content items selected from the pool users' online profiles. An administrative interface enables café owners and employees to control the behavior of the system and manage its user accounts.

2. STUDIES ON USE AND IMPACT

CoCollage was first deployed at a café in the University District of Seattle. In developing a framework for measuring the impact of our technology on sense of community and place attachment, we draw heavily from research by Rosenbaum, *et al*. [8], on *third place attachment*. In a study of 83 patrons of a coffee shop, they found that people who experience voids in their social support networks – e.g., through moving to a new place – may fill those social voids by visiting third places and connecting with the community they find there. As they develop supportive relationships through the third place, they become attached to the place itself. Drawing from sociological research, we also found a measure of psychological sense of community [9] that we believe is appropriate for assessing the impact of situated social software like CoCollage.

We have conducted two studies exploring the use and impact of CoCollage. The first study [1], conducted during the first few weeks after the deployment, adapted standardized measures of place attachment, social networks and psychological sense of community to provide a framework grounded in the social science literature for studying real world adoption of place-based community technologies. We found the standardized measures of place attachment and psychological sense of community meaningfully predicted likelihood of technology adoption and usage in a café

The second study [6] presents the results of a two-month study of the system's usage and its impact on the sense of community and place attachment in the café over time. We found that users of CoCollage experienced a significant increase in two dimensions:

- the *neighboring* factor of *sense of community*, which is the extent to which people in a community visit each other's homes and/or do each other favors, and
- the *dependency* factor of *place attachment*, which is the extent to which people rely on the place itself to have their needs met.

After reporting on the results of this study, we conclude with a discussion of lessons learned from our deployment and future plans for enhancing the system.

3. DISCUSSION

The initial studies of CoCollage were conducted when the system was deployed in only one venue. The system is currently deployed in 24 different venues throughout Seattle; most are other cafés, but we are also piloting the system in other types of third places, e.g., bars, a bookstore and a hair salon. The adoption and use of the system varies considerably across venues, and we suspect that there is similar variability in the levels of impact the system has had on the communities in each place.

We have begun to formulate some hypotheses about factors that affect the variability we are seeing. Among the dimensions we are currently considering are the characteristics of

- place (location, size, # of seats, layout, type of neighborhood),
- management (engagement of and promotion by owners, managers, baristas and other staff),
- community (# of regulars, demographics, technology comfort and use)
- system (placement & affordances)

We are interested in how urban informatics, and other dimensions of research that contribute to the understanding of digital cities, might help inform our work … and how our work may offer new dimensions of consideration to those who work in these areas.

4. BRIEF BIOGRAPHICAL SKETCH

Joe McCarthy is Principal Instigator at Strands Labs Seattle, where he leads a team that creates technologies that help people discover other people, places and things of interest in the online and offline worlds. Prior to joining Strands, Joe was a research scientist at Nokia, Intel and Accenture, where he has instigated projects and prototypes that use technology to enhance awareness, interactions and relationships in physical spaces and events, e.g., a fitness center [4], a conference [5] and corporate workplaces [6]. He holds a Ph.D. in Computer Science from the University of Massachusetts, and his career includes earlier roles as an entrepreneur, professor, consultant, and musician. More about Joe can be found on his blog (http://gumption.typepad.com).

5. REFERENCES

1. Farnham, S. D., J. F. McCarthy, Y. Patel, S. Ahuja, D. Norman, W. R. Hazlewood & J. Lind. Measuring the Impact of Third Place Attachment on the Adoption of Place-Based Community Technology. *CHI 2009,* 2153-2156.

2. Katz, J. As quoted in The New Oases, *The Economist*, 10 April 2008.

3. McCarthy, J. F., & T. D. Anagnost. MusicFX: An Arbiter of Group Preferences for Computer-Supported Collaborative Workouts. *CSCW 1998*. 363-372.

4. McCarthy, J. F., D. W. McDonald, S. Soroczak, D. H. Nguyen & A. M. Rashid. Augmenting the Social Space of an Academic Conference. *CSCW 2004*, 39-48.

5. McCarthy, J. F., B. Congleton & F. M. Harper. The Context, Content & Community Collage: Sharing Personal Digital Media in the Physical Workplace. *CSCW 2008*. 97-106.

6. McCarthy, J. F., S. D. Farnham, Y. Patel, S. Ahuja, D. Norman, W. R. Hazlewood & J. Lind. Supporting Community in Third Places with Situated Social Software. To appear in *C&T 2009*.

7. Oldenburg, R. *The Great Good Place: Cafes, Coffee Shops, Bookstores, Bars, Hair Salons, and Other Hangouts at the Heart of a Community*. New York: Paragon Books (1989).

8. Rosenbaum, M. S., J. Ward, B. A. Walker & A. L. Ostrom. A Cup of Coffee With a Dash of Love: An Investigation of Commercial Social Support and Third-Place Attachment. *Journal of Service Research*, Vol. 10, No. 1, 43-59 (2007).

9. Wilkinson, D. The Multidimensional Nature of Social Cohesion: Psychological Sense of Community, Attraction, and Neighboring. *American J. of Community Psychology,* Vol. 40, (2007), 214-229.

Contactless contact: reconceptualising radio and architecture in the wireless city

Gillian Fuller
University of New South Wales
Sydney, NSW2052
Australia
612 93856813
g.fuller@unsw.edu.au

Ross Harley
University of New South Wales
Sydney, NSW2052
Australia
612 93850758
ross@unsw.edu.au

Fuller + Harley are an interdisciplinary research-production team who fuse new media theory and practice in a variety of formats. For the past five years, they have been working on a multi-modal project that analyses the flows and network spaces of contemporary airports. Gillian Fuller, who trained as a semiotician and now specialises in new media theory, has worked in museums and published in journals such as Borderlands, FibreCulture and Social Semiotics. Ross Rudesch Harley is an artist and writer whose media work has been exhibited in venues such as at the Pompidou Centre, New York MoMA, Ars Electronica, and the Sydney Opera House. His writing has appeared in Art + Text, Convergence, Screen, Rolling Stone and The Australian. Their recent work, Aviopolis: A book about airports was published by Black Dog Publishing, London, in 2005. They are both researchers at the University of New South Wales, Sydney. For further information about their work, visit aviopolis.com, stereopresence.net and transitsemiotics.org.

ABSTRACT

The intimate relations of architecture to information in the new 'u-city' raises a set of questions around aesthetics, intimacy and constant interfacing with communication networks of all kinds. The relationships between architecture, movement and the city have long been discussed in terms of regimes of vision — eg the panoramas of railways and the cinematic city (cf Friedberg). This project is about tracking a genealogy/topology of mobile concepts, techniques and aesthetics located within the invisible waves of radio and an emergent logic of touch around "contactless technologies". Rather than follow a representationalist logic of vision, we propose a new conceptualisation of touch and contact (Abelson et al, Benkler, Greenfield).

Here we initiate some discussion around the ontological and sociological implications of ubiquitous networks and automatic identification procedures, including mobile telephony,RFID, Bluetooth, wi-fi, and other wireless technologies. We ask how the interpenetration of architectural surfaces, bodies, and mobile devices involve a range of interrelations that guide and track human bodies and material objects in constant motion. Our focus is on reconceptualisation of the relation between architecture and radio — the different channels, "frames" and thresholds that bodies are folded into. If architecture is not only about the construction of the built environment and material forms, what new insights can be gained by considering the relationship between architecture and radio in the context of the contemporary wireless world?

General Terms

wireless, radio, networks, architecture, mobility, ontology, aesthetics

Keywords

wireless, transparency, radio, networks, architecture, mobility, haptics, aesthetics, touch,

1.INTRODUCTION

"Moving within an architectural surround, a person fashions an evolving matrix, an architectural surround not entirely of her own making'" (Arakawa and Gins 2002, p 40)

This position paper proceeds from a rhizomatic assumption that people form topological constancies within their environments and that these relations have (among many other things) an aesthetic dimension. What happens when the political aesthetics of screens, windows and motion through the "cinematic city" meets the beeps, whirrs, clicks and often inperceptible codes of ubiquity or "u-city"? If the political realm of aesthetics delimits what is visible/invisible, audio/inaudible, what do we make of wireless systems, in which one navigates a dynamic aesthetic often unknowingly? In this paper we breifly look at relations of radio and architecture through a consideration of the aesthetics and politics of touch.

2. WIRELESS REGIMES AND THE LIGHTNESS OF TOUCH

Following Erin Manning, 'to touch is to engage in the

potential of an individuation' (Manning 2007, p xv). When we speak of people navigating a city scanning and being scanned, it is important not to monumentalise the nature of control society in this dynamic. From such a perspective, this is not a Big Brother style pat down from a broadcast radio imaginary. Instead, we would like to suggest that our daily navigation through networks are more modulated than this. For the touch we are dealing with is on the whole, a light and intimate touch that often happens in the background of other complex negotiations with the city/architecture. "I reach out to touch you in order to invent a relation that will in turn , invent me' (Manning 2007.p vx). As we sign up for various plans and attach various wireless prosthetics to our already thoroughly layered skin/phone/car/etc assemblages, we reach out to institutions of transit, information, and architecture in a loaded handshake — the compulsory exchange of personal data has never been made so easy or seemingly painless (for those who comply at least).

Once locked into this grid of the "urban sensible" we flex and move within a constant background hum of touch, in which one threshold just folds into another. Bodies and machines generate and radiate electromagnetic waves in seemingly infinite compositions. This is a tantalising proposition: the constant motion in which hard architecture and mobile traffic communicate may in fact impede the nomadic imperatives of everyday life. However, as is often the way, the decentering of bodies and subsequent deinstitutionalisation results in an ever tighter integration into a modulated system of control that is both public and pervasive.

"The centre is no where – the circumference is everywhere at once", says Paul Virilio. From outer space to inner space, it has all been colonised and integrated precisely because everything is now so converged and connected. And network connections are (at the least) two way. This is not always a good thing, as Vilem Flusser has noted: "An omnipresent dialogue is just as dangerous as an omnipresent discourse".

In an increasingly seamless world of ubiquitous computing and low-powered transmissions, there are no more hard-line borders. There are just intersecting thresholds of intensity. While the recognisable architectural thresholds of window, door and entrance continue to be invoked in the construction of contemporary space, ubiquitous radio identification systems add a significant number of background thresholds into the equation. Often unnoticed or at least not foregrounded in an obvious visible fashion, these transmissions between transponders and radio frequency readers have become pervasive in the background architecture of contemporary urban life. We are in touch with a highly variegated system of tracking and identifaction without being in direct contact with the surface of objects or places.

This "contactless contact" is one of the key characterisitics of low-powered radio and the miniaturised and ubiquitous modulation-demodulation procedures. The digital communication systems that facilitate the transfer of data are brought about by a series of intimate transmissions and signal decodings that are achieved by way of electromagnetic waves in the radio spectrum. This contactless transfer of data between the data-carrying device and its reader constitutes an new set of spatial and material protocols

that give shape to the ubiquitous city. In order to understand this in more detail, we need to to turn to a discussion of radio's genealogy and transformation into a new procedural system for the construction of contemporary spaces.

3.U-CITY: RADIO ON AND ON!

For us, radio offers a crucial way to understand the networks of ubiquity. It is not visual, its distributive — in waves, frequencies, and modulations, it is quite literally invisible. Radio is a "refrain" that gathers us in. RFID systems construe people and objects as particular shapes in ephemeral dynamics, haptics and channels.

The new deployment of low-powered radio generates a new intimacy. It's about the constant collapsing of the near and far, but in a seamless way. The layers of two-way radio communication operate at a series of scales, from long distance high powered radio signals to nearfield low-powered signals. Across a variety of different technical layers and devices, automatic identification and tracking operates in an apparently seamless fashion. A high density of information is packaged, processed and recognised by a number of quite different technical systems, each of which has its own parameters.

Large and small devices talk to each other constantly, creating an enormous amount of background chatter that we hardly ever hear, let alone see. Machine recognition is largely achieved today through low powered radio identification systems that utilise the radio spectrum in ways that confound traditional theories of radio. The old broadcast models of radio and the subsequent regulatory practices are no longer appropriate to describe or understand the present plethora of radio based identification systems.

It also cannot be reduced to the increased use of two-way functionality which has rarely been taken up by mainstream broadcasting and corporate ventures (as in talk-back radio, Top 40 radio etc). The multiplicity of today's radio has little to do with the singularity of "the radio" which we've come to associate primarily with AM or FM radio stations. New radio technologies such as WiFi, bluetooth and RFID show us how some of these potentialities are being realised. They draw our attention to the relationship between bodies and spaces.

The liveness and invisible aesthetics of classical radio also have little to do with the rapid evolution of the new "urban sensible" that is emerging. Our topology does not privilege the visual, but focuses on the way that coding and modulation happens over a complex assemblage that is invisible. A new approach to the wireless city is not about mapping the urban panorama. It is instead about mapping the "urban sensible" so that we focus on how the complex interplay of bodies, spaces and data become intelligible.

Our topology is also what we might call "membranic". If classical radio is largely concerned analogue wave and modulation procedures, digital modulation procedures invoke a concatenation of low-powered and spread-spectrum signals, coding, transcoding . Wireless architecture is no longer just about physical supports and the construction of lived space. It also about negotiating and understanding the different channels, "frames" and thresholds that we are folded into. In this

sense there are multiple variations on the "wireless body", which is why architecture needs to attend to this new topology: the design and construction of buildings needs to take into account the new wireless, which facilitates "contactless contact" and flow, rather than stability of form.

Hence the skin of architecture is digitally modulated, it oscillates, and contains a spectrum of code-signal that organises the body and architectural spaces in a variety of ways. At this point we might ask the question "what body?" This biometricised body is one that is endlessly varying, in constant oscillation. "When a body is in motion, it does not coincide with itself. It coincides with its own transition: its own variation." This modulation of the body and identity across distinct and simultaneous systems of reference is both utopian and in Foucault's terminology "pitiless". In other words, the utopia of the ubiquitous network has collapsed into the Baroque complexities and Gothic horrors of real space-time. "Utopia is a place outside all places, but it is a place where I will have a body without body, a body that will be beautiful, limpid, transparent, luminous, speedy and colossal in its power and infinite in its duration". This utopian body needs grounding, it needs to be contained again in the body that is "never under different skies" but an "absolute place, the little fragment of space where [one is], literally embodied".

4. CONCLUSION: TOWARDS A NEW ONTOLOGY AND AESTHETICS OF RADIO

"Bringing abundant computation and communication, as pervasive and free as air, naturally into people's lives." MIT Project Oxygen

When the city follows the new principles of non-classical radio, what does that mean for our understanding of architecture? While there has been much discussion about the nature of spectacle and subjectification (in relation to the visual concept of the city), there are many questions that arise from the perspective of considering the city under the logic of touch, nearfield radio frequency and contactless contact. We would therefore need to develop an aesthetics, an ontology and a politics that has to do with wireless. There are a range of issues emerging from this reconceptualisation, and we need to construct a language in order to do this.

"Touch" is a research project that investigates Near Field Communication (NFC), a technology that enables connections between mobile phones and physical things. They are developing applications and services that allow people to interact with everyday objects and situations through their mobile devices. More importantly, the work of Touch researcher Timo Arnall points to the kind of aesthetic framework that helps articulate many of the things we are signalling in this position paper. His work "explores the visual link between information and physical things, specifically around the emerging use of the mobile phone to interact with RFID or NFC". Specifically, his work concerns the ways we might visually link information and physical things. His work asks how we can represent objects that have a digital function, information or history beyond it's physical form. The dotted line stands as one such exemplar in the visual language and aesthetics of touch.

For us, the use of the dotted line is the equivalent to what Dziga Vertov's "Man With a Movie Camera" was for Walter Benjamin in his search for an aesthetic approach

and visual vocabulary that embodied the prosthetic eye — that 20th century body pulled apart, the mobile eye that could go anywhere. The dashed line that Arnall and his colleagues identify in a range of visual strategies, points to the lightness of touch that is part of the emergent wireless city . Radio frequencies are what cohere the mobile architectural body (an assemblage of material/immaterial, hard/soft etc) in place. It is also about the pernicious ubiquity of radio frequencies in everyday accessories of mobility: the car key, e-tag, bus card, and money cards that give us access (or not) to networks of data, objects, mobility, and highways. These diagrammatics and aesthetics refer to the ways we enter physical and data portals, pass through the threshold, open the door, enter the passenger section and so on.

The logic of access, control, tracking, and supply chain management grant unique identifiers by way of radio waves that define new shapes for the city. They promise synchronisation, anti-collision protocols, and "automatic" identification on the fly. The signal spectrum, coding and modulation procedures fold into haptic relations and new possibilities of touch.

Even when you're not touching something you're touching something. There's a contact of some sort, even if it's "contactless contact". Within the parameters of the new control society we need to focus on the politics of touch. It is a politics and an aesthetics that has moved off the body (without organs) and shifted elsewhere. The sources of control happen within the realm of touch, and we need to think about this in terms of the politics of this new aesthetics.

Bounded by skin and under the same regulatory sky, biometrics inserts the body into the distributed database, and in so doing pushes the edge of the network to a new threshold. This, coupled with the increasing granularity of biographic data, emerges as the final loop in the network's logic and actions. If biometrics capture the body, biographics captures its actions, its extensions across time and space.

A number of thematics emerge: the inadvertancy of the network; the ineluctable nature of data transfer; distributed processing; compulsory dialogue in the background of the u-city. These machinic communications are largely unseen, unknown, but not unfelt. This thresholding activity is happening all around us and all the time. It is registered on bodies with the intensity of the communications handshake. The lightness of touch and the intimacy of radio we are invoking here is highly charged. It is almost a sexual intimacy that emerges between you and the things in your pocket being read by a machine. All of these things are associated with closeness, personalisation, the touching of the senses, the penetration of a vibration that literally goes inside your body.

In the emergent wireless city, we are increasingly enmeshed in the informational loops of feedback and emergence that modulate boundaries between bodies and objects/spaces of all sorts. The wireless city is organised into differential degrees of speed and intensity that invoke new techno-social relationships between embodiment and information, between bodies and borders. As we pass through the thresholds of networked life, we become an organism of that ecology. In this seamless world of ubiquitous computing, there are no more borders, only thresholds of intensity.

REFERENCES

[1] Hal Abelson, Ken Ledeen, Harry Lewis, Blown to Bits: Your Life Liberty and Happiness after the Digital Explosion, Addison Wesley, Boston, 2008.

[2] Arakawa & Gins, Architectural Body, Tuscaloosa: University of Alabama Press, 2002.

[3] Arnell Timo http://www.elasticspace.com/2005/11/graphic-language-for-touch and http://www.nearfield.org/2006/09/the-dashed-line-in-use

[4] Yochai Benkler, The Wealth of Networks: How Social Production Transforms Markets and Freedom, Yale, New Haven, 2006.

[5] Boyer, M. Christine, Cybercities, New York: Princeton Architectural Press, 1996

[6] Klaus Finkenzeller RFID Handbook: Fundamentals and Applications in Contactless Smart Cards and Identification. John Wiley & Sons, 2003

[7] Friedberg Anne, 'The Virtual Window: from Alberti to Microsoft, Cambridge:MIT Press, 2006.

[8] Adam Greenfield, Everyware: The Dawning Age of Ubiquitous Computing, New Riders Publishing, 2006.

[9] Andrew Lippman and David Reed, "Viral Communications", Media Laboratory Research, 2003.

[10] Manning Erin, The Politics of Touch" Minneapolis: MInnesota UP, 2007.

[11] Clay Shirky, Here Comes Everybody: The Power of Organizing Without Organizations, Penguin Press, New York, 2008.

[12] David Weinberger, Everything is Miscellaneous: The Power of the New Digital Disorder, Times Books, New York, 2007.

A Digital City Needs Open Pervasive Computing Infrastructure

Timo Ojala
MediaTeam Oulu, University of Oulu
P.O.Box 4500, 90014 University of
Oulu, Finland

timo.ojala@ee.oulu.fi

Hannu Kukka
MediaTeam Oulu, University of Oulu
P.O.Box 4500, 90014 University of
Oulu, Finland

hannu.kukka@ee.oulu.fi

ABSTRACT

In this paper we promote open pervasive computing infrastructure in the public space as a prerequisite for conducting urban computing research with visible and lasting impact on the community. As a concrete example we present the UBI Open Urban Service Network currently being deployed in the City of Oulu, Finland.

1. INTRODUCTION

Urban computing studies the use of pervasive computing resources in public urban spaces. The vision of modern urban landscape is currently undergoing what might be considered the greatest and most radical change since the advent of computing. New technological innovations introduced in the very fabric of urban space allow for a deeper connection between the city and its inhabitants, making the hidden layers of social, economical and political processes, tensions, and flows both transparent and visible in ways that were never possible before.

The introduction of pervasive computing resources in urban spaces and the possibilities enabled by them have been compared to the invention of aerial photography. It allowed a non-constricted view of the city, its flows of people and goods, its excrement of waste, its blood flow if you will. Urban computing, as the trend of building pervasive computing capabilities as integral part of urban spaces is called, allows for an even more detailed view, which might be compared to the invention of the microscope. With the new capabilities brought by the introduction of heterogeneous sensor devices and interactive I/O channels, the physical fabric of cities is waking up and becoming aware of itself [1].

Despite the new possibilities of enriching the experience of the city for its inhabitants through this new technology, we have yet to discover the 'killer' applications that would really bring the experience of the city to the next level. Researchers in different fields have begun the search from different starting points, often framing the urban environment as wrought with difficulties and problems to overcome with the new technology [2].

The immense research effort has produced numerous high quality publications, but few visible and lasting contributions to the urban digital fabric. This lack of coherent progress motivated the 2005 UbiApps workshop at Pervasive 2005, where 25 researchers from academic and industry were invited based on their position papers. In their summary of the position papers Sharp and Rehman [3] identified several reasons underlying the crisis in the international ubiquitous computing research. One of them was the well-known fact that the research community values novelty over high-quality implementations and good engineering practices. This leads to 'reinventing the wheel' in tiny increments, which may be worth yet another publication, but very little else to the community, as they are not shareable due to their poor engineering. The consensus was that the community should reward good engineering and encourage research that constructs open, reusable infrastructure for the wider community's benefit.

We second this sentiment and argue that the lack of lasting and visible results (in terms of applications) in urban informatics is due to the lack of open computing infrastructure in the public space. Successful public spaces are mixtures of activities and applications, which purposefully combine physical and virtual spaces. They link places and context, consciously avoiding the "anything, anytime, anywhere" paradigm. Doing this in practice requires permanent local infrastructure, which for business reasons is often deployed as closed verticals. We wish to challenge this with an open computing infrastructure, which is provided as a "horizontal" resource to the whole community.

2. UBI OPEN URBAN SERVICE NETWORK

The UrBan Interactions (UBI) research program coordinated by the University of Oulu is building a functional prototype of a future 'ubiquitous city' in Oulu, Finland. It is based on a new pervasive computing infrastructure currently being deployed at downtown Oulu. Figure 1 illustrates the building blocks of the infrastructure branded as the "Open Urban Service Network" or OUSN for short.

Figure 1. Components of the UBI Open Urban Service Network.

The panOULU WLAN is a city-wide WLAN network provided by a public-private partnership involving five public organizations and four ISPs. The panOULU network was the most valuable result of the leading author's earlier large research project Rotuaari [4], where a small outdoor WLAN zone was first built at downtown for wireless broadband Internet access. That seed investment led to the current panOULU network, which serves as concrete evidence that academic research can impose visible and lasting change on the urban landscape. The panOULU network has currently ~1050 access points, of which ~500 reside within a 1 km radius of the city center. In its coverage area the panOULU network provides open (no authentication or registration) and free (no payment) wireless Internet access to the general public equipped with a WLAN device. Currently, about 20000 WLAN devices use the panOULU network every month so that 25-40% of them are visitors [5][6]. Supplementary services include SMTP server for sending email, AP ID positioning of a WLAN device, and the panOULU Luotsi information mash-up [7].

The panOULU BT is a cluster of Bluetooth access points whose deployment around the downtown starts in June 2009. The access points provide open and free Bluetooth connectivity to Bluetooth devices. We have developed the open BlueInfo architecture for deploying web services in these Bluetooth hotspots for cost-free context-aware mobile access [8]. A BlueInfo hotspot either pushes subscribed services at desired intervals to registered devices (BlueInfo Push) or alternatively the user invokes a particular service by sending a simple keyword query to the hotspot (BlueInfo Pull). The BlueInfo hotspot requests the service from the origin server in the Internet and relays the response to the mobile device, possibly after adaptation for mobile viewing.

The panOULU WSN is a cluster of wireless sensor network access points whose deployment around the downtown starts in June 2009. The access points have IEEE 802.15.4 MAC with 2.4 GHz radios. In fall 2009 the radios will be upgraded to the 868 MHz band, which with better range and penetration is more suitable to low-power devices. The 868 MHz band also has less interference than the 2.4 GHz ISM band used by WLAN and Bluetooth radios. The 6LoWPAN protocol stack, the light-weight version of the IPv6 protocol stack intended for low-power devices, provides half-duplex multi-hop connectivity for WSN sensors. The multi-hop connectivity means that WSN sensors form multi-hop paths, where a WSN sensor can forward the packets of other WSN sensors towards an access point. They forward the packets further to the WSN server which is based on the open source Global Sensor Network architecture. The half-duplex connectivity means that we can control individual sensors from the WSN server if needed. To demonstrate the capabilities of the WSN network we have developed the UBI-AMI prototype for advanced metering. The UBI-AMI socket sensors measure power consumption, temperature and illumination and transmit the data to the WSN server. The user can then browse the data with a web browser.

The UBI-displays are large interactive public displays (Figure 2). The first phase deployment in June 2009 comprises of six indoor displays in public buildings and six outdoor displays. The indoor displays are movable and have one 57" Full HD LCD panel in landscape orientation. The outdoor displays are installed permanently on streets and they have two adjacent LCD panels. The displays are equipped with various accessories such as 100 Mbps Ethernet connection, control PC, large disk, video cameras,

NFC/RFID readers, and loudspeakers. They also contain panOULU WLAN, BT and WSN access points. The displays have very important role in providing a visible artifact of the new pervasive infrastructure - "seeing is believing".

Figure 2. An UBI-display in the market area. The display is about 2 m tall and 1.5 m wide.

We have developed in-house software for dynamic partitioning of the screen real-estate between multiple concurrent applications. The current state machine of a display is very simple: the display alternates between a passive broadcast mode and an interactive mode (Figure 3). The transition between the modes is triggered by different mechanisms: touching the screen, face detection and authentication with an RFID tag. In the broadcast mode the whole display is allocated for the UBI-channel, where a playlist of spots (videos or images) is played back with the help of a digital signage system. The spots are allocated to noncommercial informative use and commercial advertising, which generates revenue for covering the expenses (electricity, Internet connection, maintenance) of the displays. The playlist can be configured on per display basis, so that for example a display located in a municipal facility can be exclusively assigned to noncommercial use.


Figure 3. Main services available on an UBI-display.

If a user touches the (touch) screen, the display switches to the interactive mode. This transition is also triggered, if the face detection algorithm conducting real-time analysis of the video feed of the camera determines that a sufficiently large face (i.e. a user is within desired range) is frontal to the display for a

sufficiently long time. In the interactive mode the screen is partitioned between three applications: the UBI-channel is smoothly "squeezed" into the upper left hand quarter, the lower left hand quarter is allocated to a mobile application window and the right hand half is allocated to the UBI-portal browsed with the touch screen interface.

The UBI-portal is effectively a collection of web pages (Figure 4). The UBI-portal can contain any third party web page in the public Internet. As an example, the local main newspaper Kaleva provides the "Oulu today" page with topical news, events and weather in the city (Figure 4(a)). The Map page is a service directory based on Google Maps, where selected services are imposed on a map of the city. In Figure 4(b) UBI-hotspots and bus stops are checked and imposed on the map. Further, a particular bus stop is selected, providing the timetable of the buses soon leaving from that bus stop. Figure 4(c) shows the photo gallery based on Flickr and browsed with a Tag Galaxy implementation tailored for the UBI-portal. Figure 4(d) illustrates the video gallery implemented with YouTube. The galleries have two instances, a generic gallery and a gallery dedicated to the photos and videos uploaded by the users of the UBI-displays. Further, the contents of the UBI-portal can be configured on per display basis: for example the UBI-portal of the display located in the Science Centre has a page dedicated to the Science Centre. The end of the interaction with the UBI-portal is determined with a timeout since the last interaction or face detection event, after which the display returns to the passive broadcast mode.
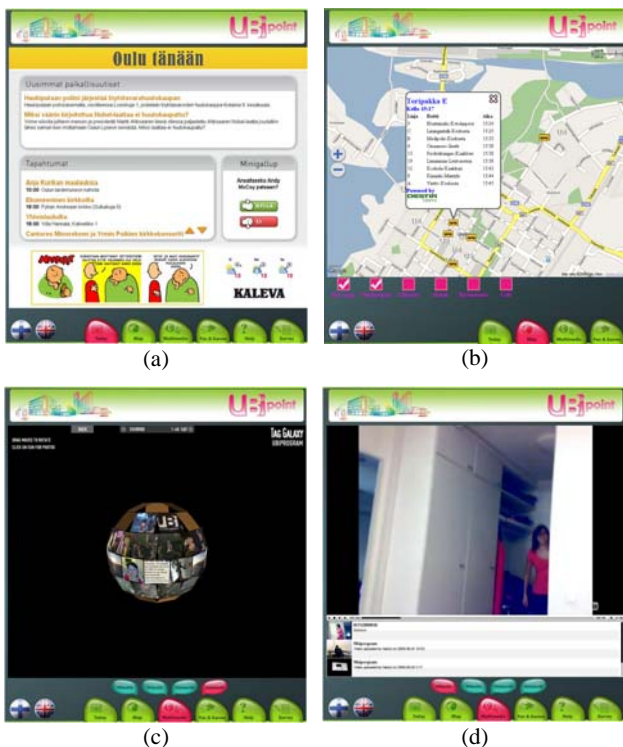
Figure 4. Selected pages in the UBI-portal: (a) "Oulu today"; (b) Map and service directory based on Google Maps; (c) Flickr photo gallery browsed with Tag Galaxy; (d) Video gallery implemented with YouTube.

Alternatively, a user can "log in" to the display by presenting to the RFID reader his/her "UBI-jewel" containing an RFID tag, which has earlier been paired with his/her mobile phone. Upon the login the Java UBI-mobile client executing at the mobile phone is presented with a list of mobile applications available at this particular display. The display is again partitioned between three applications: the UBI-channel, the UBI-portal, and the mobile application window as a personal partition into which the selected application is loaded. The UBI-mobile also allows the user to upload photos and videos to the galleries browsed on the UBI-portal. When the user logs out, or just leaves triggering a timeout, the personal partition is removed and the display returns to the passive broadcast mode.

These heterogeneous computing resources constitute a large distributed system which is virtualized by the UBI Middleware. A key functionality provided by the middleware layer is distributed communication based on the publish-subscribe paradigm, which allows temporal and referential uncoupling of communicating processes. Another key functionality is resource management implemented by the corresponding resource management component in a UBI Hotspot, which is a logical grouping of co-located resources, usually a UBI Display, a panOULU WLAN AP, a panOULU BT AP and a panOULU WSN AP. The resource management component allows for temporal leasing of the resources with different types of leases, ranging from open multi-user social leases to private single-user leases. Users are also able to place leases in queue, thus allowing the reservation of a resource that is currently unavailable or busy.

The UBI Middleware should provide open and standardized interfaces which will allow the general public, the open source community and the SME's to develop their own applications and services atop the UBI infrastructure. We argue that while an infrastructure like this is absolutely necessary to take the city from 'sleeping' to 'sentient', we cannot presume to foresee all the possibilities created by the new infrastructure. Thus open and transparent access to the infrastructure is crucial in finding the killer applications that will make the new infrastructure irreplaceable to the people living in the city. As means for stimulating open innovation the UBI program releases open source software libraries. So far two open source libraries for the Symbian platform have been produced: the UBI Toolkit for rapid prototyping of mobile multimedia applications, and the Gesture Recognizer for implementing mobile applications with gesture control. These libraries reflect the special attention paid to the personal smart phone as a key device in the interaction between the user and the ubiquitous city.

The infrastructure materializes as two types of urban computing applications, demos and pilots. A demo is a short-lived small-scale evaluation of new technology, service concept or user interface paradigm. It's often implemented using rapid development process, and empirically evaluated in form of small user tests either in laboratory or real-life setting. Successful functionalities are integrated into a pilot, which is a large-scale prototype of the ubiquitous city. The first UBI pilot will be executed at downtown Oulu in summer 2009. We will challenge the general public to try out the new infrastructure and services. This way Oulu will turn into a living laboratory, where all citizens are able to participate in developing the future ubiquitous city.

3. DISCUSSION

In this paper we summarized the ambitious and expensive infrastructure deployment we are committed ourselves to. We are doing tons of engineering that as such has very little value in traditional academic terms. However, at least for the time being we are optimistic that the investment will eventually pay off, but it is far too early to tell. The final judgment will be imposed by our community, not by the number of academic papers we manage to publish. We know that we will be exposed to horrendous public scrutiny immediately after the 'ubiquitous Oulu" goes live on June 1, 2009. This will be largely due to the fact that our offering is very thin in terms of content ('content is king') and applications, for we have been forced to dedicate our limited resources mostly to the fundamental hardware and software infrastructure so far. It may very well happen that in two-three years time we will conclude that there is no need for this infrastructure in our community. At the same time we are exploring different alternatives to make our open infrastructure available to other researchers. As one option we are soliciting leading researchers on the field for their opinion of an "Open Ubiquitous City Challenge" organized atop our urban 'testbed'.

At the moment it is also far too early to try to evaluate our upcoming infrastructure with some characteristics and metrics such as those introduced by Kostakos *et al.* [9]: mobility, social structure, spatial structure, temporal rhythms, and facts and figures. We certainly would want to extend that set of metrics with a couple of our own, namely scalability and sustainability. To what extent our ongoing infrastructure deployment in a small downtown of a city of about 137000 people would scale up to a really large urban space? Sustainability would be measured with two related metrics: financial and technological. Many academic infrastructure deployments have fallen apart, because they did not have any long-term financial basis for covering the expenses of maintenance and further development. In our case the panOULU network has survived over five years with its PPP model. We also know for sure that by selling a portion of the capacity of the UBI-channel for commercial advertising we can create sufficient revenue to cover the operational expenses of the UBI-displays. But as of now we do not have such assurances for the panOULU BT and panOULU WSN. Technological sustainability refers to the expected lifetime of the current infrastructure and the expensive renewal of outdated infrastructure in the future.

4. REFERENCES

[1] Townsend, A. Foreword in *The Handbook of Research on Urban Informatics: The Practice and Promise of the Real-Time City.* M.Foth (ed), Information Science Reference, 2008.

[2] Bassoli, A, Brewer, J, Martin, K, Dourish, P, Mainwaring, S. Underground Aesthetics: Rethinking Urban Computing, *IEEE Pervasive Computing*, vol. 6, no. 3, pp. 39-45, July-September, 2007.

[3] Sharp, R. and Rehman, K. The 2005 UbiApp Workshop: What Makes Good Application-Led Research? IEEE *Pervasive Computing*, vol. 4, no. 3, pp. 80-82, 2005.

[4] Rotuaari – Context-aware mobile multimedia services. http://www.rotuaari.net.

[5] Ojala T, Hakanen T, Salmi O, Kenttälä M and Tiensyrjä J. Supporting session and AP mobility in a large multi-provider multi-vendor municipal WiFi network. Proc. Third International Conference on Access Networks, Las Vegas, NV, 2008.

[6] panOULU network, http://www.panoulu.net.

[7] Kukka H, Ojala T, Tiensyrjä J and Mikkonen T. panOULU Luotsi: A location based information mash-up with XML aggregator and WiFi positioning. Proc. 7th International Conference on Mobile and Ubiquitous Multimedia, Umeå, Sweden, December 2008, 80-83.

[8] Kukka H, Kruger F and Ojala T. BlueInfo: Open architecture for deploying web services in WPAN hotspots. 7th IEEE International Conference on Web Services, Los Angeles, CA, July 2009, to appear.

[9] Kostakos V, Nicolai T, Yoneki E, O'Neill E, Kenn H and Crowcroft J. Understanding and measuring the urban pervasive infrastructure. *Personal and Ubiquitous Computing*, vol.13, no. 5, pp. 355-364, 2009.

5. AUTHOR BIOGRAPHIES

Dr. Timo Ojala is a professor of computer engineering at the Department of Electrical and Information Engineering at the University of Oulu, Finland. He obtained his M.Sc. (with honors) and Dr. Tech. degrees from the University of Oulu, Finland, in 1992 and 1997, respectively. Dr. Ojala is motivated by research with visible and lasting benefit to the community.

M.Sc. Hannu Kukka is the technical project manager of the UrBan Interactions program and a doctoral student on urban informatics at the Department of Electrical and Information Engineering at the University of Oulu, Finland.

The Export of Ubiquitous Place: Investigating South Korean U-cities

Germaine Halegoua
University of Wisconsin-Madison
2328 Atwood Avenue, #2, Madison, WI 53704
1.917.584.3658
grhalegoua@wisc.edu

ABSTRACT
U-cities in South Korea are becoming objects of inquiry for a variety of disciplines. These U-cities or ambient informatics environments are slated to be wrought with technologies that are local in their scope and effect, simultaneously these localized technologies, environments, and user practices are intended to globalize the South Korean cities. While designers, planners, and government officials claim that these urban spaces and responsive environments will retain and exhibit Korean culture, localizing these spaces and practices in some way; these cities, particularly New Songdo in Incheon is being exported as a model of development abroad. Municipal governments in Algeria have already signed contracts with the Korean government to exchange currency for the planning model. While it is important to view these imminent districts and urban environments in terms of globalization strategies in urban development, it is also important to consider the specific Korean IT environment, especially the nation-state's electronics industry in asking why U-cities are particular to Seoul and Incheon and have taken root in these places, deeming them digital media capitals. Concurrently, an investigation of how a model so particular to the socio-cultural, industrial, political environment of Korea can be packaged for export. This paper will investigate conditions (aside from culture) in which these cities are anchored in and benefit the "local" as well as analyze and investigate the possibility and challenges of exporting these U-cities to other regions and other places.

Keywords
Digital Media City, New Songdo City, Seoul, Incheon, South Korea, U-city, U-life, ubiquitous computing, urban planning, media capitals

1. INTRODUCTION
By 2014, South Korea will house two "ubiquitous cities" or U-cities, one of which, New Songdo, will be considered the largest in the world, and built from scratch only approximately 40 miles from downtown Seoul, in Incheon. Seoul is slated to house its own ubiquitous city, the Digital Media City (DMC), which will be completed by 2010 in the Sangam-dong district. These ubiquitous cities promise to serve as major information technology hubs for East Asia, showcasing pervasive computing, locative media, responsive environments, wireless technologies, RFID and QR coding projects, as well as telecommunications research and development headquarters.
The director of the Persuasive Technology Lab at Stanford University suspects that "New Songdo sounds like it will be one big Petri dish for understanding how people want to use technology"[8]. Beyond this, John Kim, one of the developers associated with New Songdo City Development, the group spearheading the operation, suggests that New Songdo will exemplify a digital way of life, what he is calling, "U-life". What U-life is exactly, is yet to be seen. Yet, whatever the manifestation, the expectation and intention is that U-life will be native to Seoul and Incheon. One of the claims and forethought of the developers, designers, and government officials is that U-cities incorporate local practices, culture, and style.
More recently, the Korean government has signed contracts with overseas governments, like Algeria, in order to export their U-city model to willing buyers. The U-cities then, also represent a novel case through which to investigate networked practices, technologies, and urban plans that have been established for global export and attraction. Questions arise due to these recent activities concerning how a city or district that is yet to be inhabited, can serve as a model or paradigm for successful urban development; as well as questions concerning what exactly the model for export is.
These case studies provide a very unique opportunity to investigate the social shaping of technology, looking at the ways in which place, local culture, and urbanism, interact and influence technologies and vice versa. Scholars have just recently begun to investigate the ways in which these cities and districts interact with the local South Korean culture. One of the salient questions to be investigated in this paper is why have South Korea, Seoul and Incheon in particular, become the centers for this type of urban development. Some of the previous research into this question will be discussed as well as a new lens and categories through which to understand Seoul and Incheon as particular sorts of "media capitals".

2. NEW SONGDO & DIGITAL MEDIA CITY
While the fiber optic infrastructure of the U-cities is already laid and in service, along with WiBro, and Digital Multimedia Broadcasting (DMB) to which millions of South Koreans already subscribe and use, the technologies that will fill residences, offices, and line city streets in New Songdo and DMC are yet to be wholly implemented and designed. The uses and practices that will accompany these technologies are also yet to be seen. Some of the technologies and digital projects that have been suggested include:
-- "Green" technologies such as a centralized pneumatic tube system for waste management; charging stations for electric vehicles; smartcard activated bicycle rental stations; RFID and sensors on recycling bins to credit users for their deposits; and all buildings adhering to LEED standards
-- Linking all information and data collection systems to coincide residential, medical, government, and commercial data; equipping homes, offices, public, and commercial spaces with embedded computers and computing opportunities; equipping

1

residents with a smartcard or other mobile information storage device that will serve as a universal interface to various activities

-- Designing sentient objects and RFID sensors/transmitters throughout households, workspaces, and places of leisure, such as floors that sense a fall and call for help; objects that "know" where they came from and relay other commercial information. Responsive environments have been discussed as well, like intelligent street lighting and diverse ways to manage and regulate municipal infrastructure efficiently

-- Promoting digital urban design projects like the Media Board, and Digital Odometer were proposed. The former project is an effort to incorporate digital signage on building facades to be used for announcements, events, and by artists; the latter is a visualization of information about and information being generated by the DMC

One noticeable element connecting all of these ubiquitous technologies and intended practices is that they are local in their reach. Their networked promise is felt directly in the city street, apartment, building, park, city, etc in which they are embedded. Also, the technologies are intended to be local in their form, purpose, and design. In interviews and comments made to journalists about New Songdo and DMC environments and technologies, designers and planners holdfast to the notion that all designs and developments are meant to reflect and perpetuate Korean culture. The various ways in which this effort manifests through architecture, technology design, urban form, and globalization strategy will be discussed in subsequent sections.

3. LOCAL SOCIO-CULTURAL ASPECTS

In this section, further analysis of advertisements, interviews, and quotes from spokespeople representing and responsible for the design and development of New Songdo in particular will be included in regard to the ways in which the design of Songdo is intended to incorporate and relate to Korean culture. While U-life is claimed to be uniquely Korean, this section will investigate those claims.

3.1 Design

The design of the city although recognized by its architects KPF as a hybrid of sorts, a "synergy city", incorporating Western design of iconic cities like Sydney, New York, Venice, and Paris to name a few, is also recognized as incorporating design that the architects reference as "Korean typology and Korean ecology" meaning that the shapes, patterns of parks and open spaces might make reference to the Korean landscape [7].

The planners and architects of New Songdo tend to operate under the assumption that Korean landscapes are typically represented by "multilane thoroughfares and large buildings on small plots of land, which don't support a vibrant street life", which are elements that the developers and designers desire to counteract [1]. However, the density that is typically associated with a Korean aesthetic is to be maintained. Townsend notes that the visual density of Korean based websites and urban landscapes that are almost overloaded with visual information, may be part of this Korean aesthetic.

Interestingly, unlike the DMC in Seoul, there is minimal local culture in Incheon, or at least what is Incheon culture may be difficult to identify as local immediately, as the city is being built entirely from scratch. While Korean culture might ultimately become evident within Incheon, New Songdo is a cosmopolitan hub where English is the lingua franca, intended to attract international money and international talent.

3.2 Technology

There is no doubt that a dominant Korean culture of broadband use and networked consumer technologies, practices in everyday life prevails in major cities like Seoul. Use of technologies in public designated places like Internet cafés or PC-Bangs, public competitions of StarCraft, and DMB toting smart mobs are overwhelmingly evident in textual accounts of Seoul life. It can be argued that there is a specifically Korean culture of computing and digital media consumption, and a particularly Korean vision of the future of computing as well.

Some scholars and journalists argue that in Korean cities, there is less expectation of privacy, and consequently less value placed on containing the spread or limiting the interconnectivity and accessibility of personal information. A. Townsend, a consultant on the Digital Media City project in Seoul notes such factors such as high levels of broadband and fiber optic penetration, mobile technology use, a general embrace and culture of computing and gaming, maintenance and attendance of specialized public spaces for networked communication unify to compose something that resembles a Korean computing culture [11].

3.3 Electronics Industry

3.3.1 Industry Development

This section outlines the development of the electronics industry in South Korea. The role of the Korean government in establishing technical standards, and maintaining control over the electronics industry is considered, as well as the character and organization of the *chaebols* themselves, particularly Samsung and LG. Previous studies of New Songdo and DMC (albeit few) have yet to examine the electronics industry in South Korea as a local specificity that shapes the construction and need for U-cities within the nation-state. While scholars and journalists have noted Korea as the "most wired nation" and marveled at Korea's broadband penetration rates and government involvement in the networking of the nation, little attention has been paid to the functioning and industry logics of the homegrown electronics commercial sectors.

What is of particular interest in this case study is the development and globalization of the electronics industry and expansion of markets post-economic crisis, circa 1997. As H. Lee among others has noted, the Korean electronics industry has grown to specialize in mass produced consumer electronics that operate under the logic of economies of scale [5]. While this creates certain benefits in financial gain, this production strategy also creates some challenges for Korean products and presence in global markets.

Additionally, while I have considered elsewhere that New Songdo and DMC are part of a larger globalizing strategy that adheres to concentrating on IT development within cities in order to gain cachet and visibility as a global player or node in a particular type of global network, there is another lens through which U-cities can be read. In the case of Korea, these U-cities also fill a void in the structure and organization of the electronics industry.

3.3.2 Research and Development

The key challenge of the Korean electronics industry to be considered here is that through the strategic cultivation and dependence on mass produced consumer electronics *chaebols* such as Samsung and LG among other commercial enterprises have failed to develop adequate R&D and testing grounds needed for the development of luxury, niche electronic products. These U-cities are the ultimate laboratories, experimental spaces for the testing and further research and development of niche products to compete on the global market. The cities do not only yield cachet and a means to attract foreign investment and talent, but also fill an essential void in the current structure of the electronics industry in order for the industry to diversify and expand into new realms of development, manufacturing, and sales. Though many technologies implemented in these spaces will undoubtedly fail, those that succeed may shift Korea's electronics industry from an economy of scale to a specialized, luxury market.

3.3.3 IT Media Capital

M. Curtin's notion of "media capitals" seems to be directly applicable to the future developments of ubiquitous cities. While this sort of theoretical understanding of U-cities is definitely premature, I contend that it will prove incredibly useful as the culture and activities within the cities manifest and become mobile. Curtin describes media capitals as "sites of mediation where complex forces and flows interact", these capitals are "meeting places where local specificity arises out of migration, interaction and exchange" [2]. The ubiquitous cities in a sense anchor the global flows of information, talent, and resources in local space, the place and culture adding a "specific logic of its own" to the infrastructure and activities involved [2]. Even to the point of developing a place-based take on digital culture, U-Life. If only temporarily, these cities have the potential to be new media centers, media capitals that are governed more by the market and the drive toward innovation, than they are governed by the Korean state.

What is unique about Incheon and Seoul as media capitals is that unlike the urban environments identified by Curtin, these places specialize in new media consumption, as significantly as production, experimentation, and distribution. In fact, an illustrative example of this is when Blizzard Entertainment, the makers of StarCraft announced the global release of the newest incarnation of the MMOG to an ecstatic crowd in Seoul. The venue of the debut announcement speaks not only to the fanatical zeal with which the Korean population adore and play this classic game, but that certain digital technologies take hold in certain places and not others, and that these places and the ways in which indigenous populations react to and augment the connotations of global products through their local consumption, endow both the place and technologies with certain value and salience. Interestingly, while Korea has been a media capital in the past due to their production and distribution of computing hardware and consumer electronics, the country's cities are now making efforts to export web-based digital products such as popular Korean-made games and popular web portals to surrounding countries in East and Southeast Asia.

These case studies provide a very unique opportunity to investigate the social shaping of technology, looking at the ways in which place, and local culture interact and influence technologies and vice versa. The authority primarily gained by Incheon and Seoul in the global arena will be as places of experimentation and innovation rather than for the products these places produce (though the hope is that this latter recognition will follow). These cases show that unlike Sassen's global cities these media capitals become control and command centers not of services, but of digital innovation.

4. EXPORT OF URBAN FORM

4.1 Export of Korean cultural products

With the rise of "Hallyu" or the Korean Wave over the past 10 years, cultural products with Korean origins have been circulating and desired throughout Asia and beyond. Korea has exerted a newfound dominance in Asian cultural products such as cuisine, pop music, television dramas, films, and fashion. This section will look at the scholarly literature and popular press on the Korean Wave interrogating why these products are considered Korean and what of "Korea" travels with them regionally and globally.

An aspect of the Korean Wave that is often noted by "Hallyu" consumers is that South Korea is viewed by populations in Asian countries as a filter or sieve for Western culture and cultural products. Television formats are bought on the international market and localized using Korean actors, language, fashion, cultural norms, settings, style and sensibilities. Hip-hop music has been adapted in South Korea, with Korean language and references, and is then transported regionally. Western fashion is often appropriated directly with slight variations in sizes and colors offered. Documented interviews with Asian youth highlight how younger audiences often connote Korean goods and services with cosmopolitanism, wealth, modernity, and an openness typically associated with the United States [9]. The idea that Korean lifestyle and products echo the West, but are still Asian in some way is attractive to consumers in South and East Asia.

What evidently travels with Korean cultural goods across borders is connotation as well as language, appearance, and style. One can argue that this regional connotation can be maintained through these U-cities and may augment the catalog of Hallyu products, itself being a "product" for export.

4.2 Exporting a City?

Successful urban developments or urban projects often bestow the opportunity to generate funds through consulting or signing more clients, and fame for creating a new paradigm of planning and design garnering an addition in text books, press, or exhibitions. An oft-cited example of this is the development spurred by the Barcelona 1992 Olympics where several event driven construction and urban renewal projects led the city and its architects to find acclaim and profit in marketing their successful urban management and urban regeneration model to other locales. However, in the case of New Songdo the goal has been to create an *exportable* urban model. What this means exactly is unclear. Though the question of what is being exported in particular is yet to be concluded, there are already reported buyers. In October 2007 the Korean Ministry of Construction and Transportation announced that the Korean government would begin exporting "U-city design", specifically "its ability to solve existing transportation and environmental problems and significantly improve education, medical and high-tech services" [6]. Representatives from Algeria signed

contracts with the Korean government, commissioning five Korean construction companies to complete the satellite city of Buinan (30 kilometers south of Algiers) by 2011 [6].

Scholars such as Townsend have noted that although Seoul can be used as model for "the rapid deployment of broadband" the author is keen to note how unlikely and paradoxical it would be to replicate this model in a disparate location, as it is inherently indigenous. Townsend concludes that "broadband networks and applications have generally worked themselves into or mimicked existing urban culture, not radically transformed it" [11]. While Townsend remarks apply to the DMC, how broadband networks and networked practices will mesh with a nascent, nearly non-existent urban culture in New Songdo is a prognostication at best. It is possible that New Songdo's model can be exported to the Middle East for this precise reason, that there is no urban culture to mesh with or mimic as of yet, apparent instead is a model with intended purpose. Under this logic the construction in Buinan is like a cinematic runaway production, or extraterritorial in a sense – a place where local, identifiable particularities are erased and substituted with the particularities and logics of another (i.e. when Toronto is dressed up as New York to save costs).

A recently, prominent research question in regard to the clustering of specialized industries and activities has been: why this place? Why is the film industry rooted in Hollywood and Bollywood in Mumbai; why does software emanate from Silicon Valley and Tokyo and not from Santiago? This question should also be asked of the U-cities: why Seoul and Incheon and not some other place? And of New Songdo, the interrogation should go further: Does it have to be this place? When can it not be? Though New Songdo and Seoul can be viewed as new media or digital media capitals in accordance with M. Curtin's media capital argument, we can also consider circumstances or manners in which these paradigms can be packaged for export, similar to the television formats Korea is known to import on the international market and localize. While in other culture industries Korea is known to the region as the filter for the West, in the case of U-city design, it may come to be known as the supplier, creating various global filters through which the design must pass to be palatable regionally. Ironically, what is successful about the U-city design model will be determined by Korean place-based specificities like the ones described above: computing culture, industry logics and lacking, density, government involvement, and aggregations of talent.

5. DIGITAL MEDIA CAPITAL

Spaces such as Silicon Valley and the Multimedia Super Corridor in Kuala Lumpur have attracted the attention of media, urban studies, and technology studies researchers who see these spaces as innovative locations of production. Research into spaces of technological consumption has been less prominent however, such as studies of cybercafes, computer labs, arcades, corporate buildings, and households. U-cities offer a unique opportunity for researchers to examine new media practice and consumption at the level of the urban street and the mundane. In these U-cities, virtual activities are not confined to four-walled spaces, neither the room nor the screen, but are rather located in physically walk-able environments – thus everyday practices and public spaces become important objects of inquiry. The major initiative in New Songdo and the DMC is to make urban digital hubs that are public, interactive, profitable, and filled with design ideas that presumably coincide with pedestrian and business needs, as well as fully utilizing urban space as a laboratory for digital media innovation.

While the city as a category has been investigated as a series of "electronic spaces", and with prefixes such as wired, digital, or smart, all of these studies have dealt with the reality that cities are never *completely* digital, electronic, or wired, that there are always spaces that are not linked within the network. However, in the case of the U-cities in Seoul and Incheon, this duality of with and without is not evident. These urban environments, are places where wireless and virtual networks are not being implemented in the "right spaces" in the "right ways", but indiscriminately everywhere. The intentional carving out and clearing of large areas of geographic space, managed by the city and federal levels of government, for the promotion of digital culture and the use of telecommunication technology, is something entirely new and worthy of further interrogation.

6. REFERENCES

[1] Cortese, A. "An Asian Hub in the Making". In *New York Times*. December 30, 2007

[2] Curtin, M. 2004. "Media Capitals: Cultural Geographies of Global TV". In L. Spigel and J. Olsson, *Television After TV*. Duke University Press.

[3] Gale International. "Songdo IBD" http://www.galeintl.com/home/projects/songdo-ibd.aspx

[4] Huat, C and Iwabuchi, K. 2008 *East Asian Pop Culture: Analyzing the Korean Wave*. Hong Kong University Press.

[5] Lee, H 1995 "Globalization, FDI, and Korean Competitive Strategies of Korean Electronic companies" Nomura Research Institute and Institute of Southeast Asian Studies. In *The new wave of foreign direct investment in Asia*. NRI.

[6] Ministry of Construction and Transportation. "Korea to export new city design". Government Release, October 16, 2007 http://www.kdi.re.kr/kdi_eng/highlights/govern_view.jsp?no=1950&page=4&rowcnt=10

[7] Mortice, Z. "New Songdo City Looks Back at the New World for Older Urban Models". In *AIArchitect*, July 25, 2008. http://info.aia.org/aiarchitect/thisweek08/0725/0725d_songdo.cfm

[8] O'Connell, P. "Korea's High-Tech Utopia, Where Everything Is Observed" in *New York Times*. October 5, 2005

[9] Onishi, N. "China's Youth Look to Seoul for Inspiration". In *New York Times*, January, 2, 2006

[10] Sassen, S. 2001 *The Global City: New York, London, Tokyo*. Princeton University Press.

[11] Townsend, A. M. 2007 "Seoul: birth of a broadband metropolis". In *Environment and Planning B: Planning and Design*. Volume 34, pages 396-413.

7. BIOGRAPHY

Germaine Halegoua is finishing her dissertation "New Mediated Spaces and the Urban Environment" in the Media & Cultural Studies Program at the University of Wisconsin–Madison. She has received grants for research travel to Seoul and Incheon in order to study the developing U-cities of South Korea during the Summer 2009. During the Digital Cities 6 Workshop she will be presenting and discussing her preliminary findings on the Digital Media City and New Songdo in relation to processes of globalization and the cultural, industrial, and political economic particularities of their imagination and inception.

Mobile Interactions as Social Machines:
Young Urban Poor at Play in Bangladesh

Andrew Wong
Telenor Research and Innovation
Center Asia Pacific (TRICAP)
Office Block, Cyberview Lodge
63000 Cyberjaya, Selangor, Malaysia
+60169737332

Andrew.Wong@telenor.com

ABSTRACT

This paper examines the societal impact of young urban poor's mobile interactions in three large cities in Bangladesh based on the on-going 2 years ethnographic study. The key question raised here is how the communication through the mobile phones is affecting the shape of the urban interactions. I speculate the emergence of three types of mobile interactions as social machines that eventually incubates and shapes the present and future urban interactions.

Keywords

Young Urban Poor, Mobile Phone, Social Machine, Social Informatics, Developing Country

1. INTRODUCTION

Despite the mobile phone's growth in subscribers and success as everyday communication tools on a worldwide scale, it remains surprisingly unstudied within the developing countries context. Here, I examine some of the social aspects of young urban poor's mobile interactions as a whole and understand its continuing social impact through the lens of urban interactions. According to Townsend, mobile communications systems are essentially "urban metabolism", and have fundamentally rewriting the spatial and temporal constraints of all manner of human communications in the work, family, or recreation and entertainment context [1]. Also, I argue that we need a systems approach, in the sense of "social informatics" of mobile interaction, is needed if we are to be able to understand and make sense of the future mobile interactions. Holistically, young urban poor's mobile interactions must be studied as an entity in its own right to ensure it personify them in the right light. According to Kling [2], social informatics,

> A serviceable working conception of 'social informatics' is that it identifies a body of research that examines the social aspects of computerization. A more formal definition is 'the interdisciplinary study of the design, uses and consequences of information technologies that takes into account their interaction with institutional and cultural contexts.'

Therefore, the main contribution of this paper is to propose and critically evaluate young urban poor's mobile interactions as "social machine" through the wide lens of social informatics. For this end, three different types of mobile interactions as social machines are presented. It is based on the very nature of mobile phones' portability and frequent use makes them an ideal subject to study them as social machine.

2. ETHNOGRAPHY OF THE YOUNG URBAN POOR

The study reported here is a synthesis of several ethnographic studies on the poor households and individuals over two years period in three large cities in Bangladesh: Dhaka, Chittagong and Sylhet. Fetterman [3] defines "ethnography is the art and science of describing a group or culture" (p. 1). In the context of this study, I have defined young urban poor with several characteristics: A dependent, typically living in an urban household with less than 7000 Takas per month, age between 12 and 25 years, and mostly still in school and college or working odd jobs. I drew a youth sample of 32 individuals from the three ethnographic studies mentioned earlier. The breakdowns of participants by cities are 14 in Dhaka, 7 in Sylhet, and 11 in Chittagong. These sites were selected as major cities in Bangladesh with differing cultural, socio-economic and outside influences such as home coming family members from overseas.

In drawing up a robust research design, I rely on individual interviews, family interviews, observations, and interpretative analysis in my effort to synthesize and appreciate the idea that the socio-cultural and economic situation of the poor youth can better be understood from the point of view of the youth themselves, rather than my own hypothesis. The analysis of this research draws upon work across mobile information and communication that were framed by three key genres of using the mobile phone: solely for entertainment purposes, as a means to creating a greater network, and being creative to maximize per minute airtime usage by means of SIM-switching and coded missed calls. These three genres of using mobile phones are a way of describing different degrees of usage sophistication and socialization intention in mobile communication engagement with reference to socialization context, rather than producing 'hard data' on the percentage of calls per day or average number of calls.

3. MOBILE INTERACTIONS AS SOCIAL MACHINES

The mobile phone is different from any previous studied social systems in that it is growing at a rate greater than many communication tools and spreading more equally in among the world population. More than ever, human social interaction is now nearly in every sense linked to the mobile use [4,5,6,7]. Therefore, the notion of mobile interactions as social machines, in part contributed by the vast and decentralized use of mobile. Mobile communication plays a role in human social interactions – as communicator of human voices across distance, as entertainer of human desire to be entertained, and as information disseminator. Moreover, by aligning our frame of thinking in that mobile interaction as social machine, over time will allow us to better understand human communications and interactions behaviors that will in turn affect urban interactions. The social-interactional perspective informs us about interaction behavior unveiling itself over time. According to Bakeman and Gottman [8], they argue that through a sequential view, researchers will have the best chance for clarifying the dynamic nature of social interaction process.

The idea of a social machine was introduced by Berners-Lee in his book *Weaving the Web*, which hypothesized that the architectural design of the Web would allow developers, and thus end users, to use computer technology to help provide the management function for social systems as they were realized online [9]. Here I will provide three different types of mobile interactions as social machines to provoke our thinking about how the present mobile interactions in Bangladesh will evolve over time.

1. Paired connects – There is hyper-localization of communication between two individuals. At certain times, the hyper-localization happens between one individual and connected with three to four individuals, who happened to share a mobile phone. Due to this hyper-localization, coded behaviors and practices exist as a reflection of their need to personalize their attitude, mood, and attachment to a cause or personality. Here, mobile phone plays the role of relationship builder with strong emphasis on private life (see Figure 1).

2. Mesh connects - This is due to the impact of globalized consumerism in daily life – in both products and services, as such it influences the young urban poor to have the urge to connect to the rest of the world. The communication through the mobile no longer situated locally, the need to connect create a sense of interlocking with others, mainly residing in a more mature countries. Micro-mobility is already pervasive features in young urban poor contemporary lifestyle. The role mobile phone plays here as an activator with strong emphasis on public life that meshes with a broader, global outlook (see Figure 2).

3. Collective action connects - The young urban poor grouped together based on action of specific activities and less of the traditional psychographic makeup such as age or gender. This collective action behavior depends on the fact that the young urban poor actively

seeking to connect with each other, and intuitively know the next course of action the rest will do. Mobile phone is now a tool for meaning making (see Figure 3).
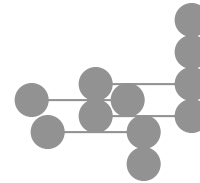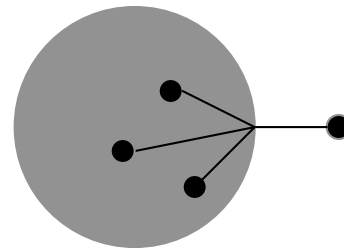

Figure 1. Paired connects.

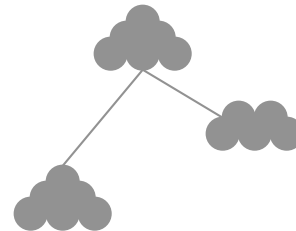

Figure 2. Mesh connect

Figure 3. Collective action connects

4. WORKSHOP CONTEXT

The illustrations of mobile interactions as social machines are meant to present examples based on the ethnography studies conducted in a developing country, in this case Bangladesh.

From the urban informatics perspective, I foresee a significant potential for examining the present way Bangladeshi young urban poor get connected through mobile phone and how it will impact and shape future urban interactions. Two distinct ways characterize the benefit of examining mobile interactions as social machine: front stage and back stage. For example, with similar line of argument with Goffman's front stage and back stage concept [10], mobile interactions needed a place in everyday social interaction as a backdrop in order to an impact and shape everyday life (front stage). Also, a lot of mobile interactions take place as underground practices unique only to a group of people such as coded practices of using mobile phone such as missed calls (back stage).

5. CONCLUSION

The work presented in this paper is not to be thought of as a quest to find generic forms of human behavior. Rather, I argue that we can discover the complex social human interactions through the social machine lens. With this understanding, as researchers we are more able to understand the human dynamics of the mobile interactions and how trying to better predict where and how it will heads in the future.

6. ACKNOWLEDGMENTS

7. REFERENCES

[1] Townsend, A. M. 2000. "Life in the realtime city: mobile telephones and urban metabolism". Journal of Urban Technology. (7)2:85-104.

[2] Kling, R. 1999. What is social informatics and why does it matter? D-Lib Magazine. 5 (1) at http://www.dlib.org:80/dlib/january99/kling/01kling.html

[3] Fetterman, D. M. (1998). Ethnography: Step by Step. London: Sage Publication.

[4] Bell, G. 2005. The age of the thumb: A cultural reading of mobile technologies from Asia. In P. Glotz, S. Bertschi, & C. Locke (Eds.), Thumb culture: The meaning of mobile phones for society (pp. 67–88). Bielefeld, Germany: Transcript Verlag.

[5] Cairncross, F. 1997. The death of distance: How the communications revolution will change our lives. Boston, MA: Harvard University Business School Press.

[6] Wong, A. 2007. The local ingenuity: Maximizing livelihood through improvising current communication access technology. In Ethnographic Praxis in Industry Conference Proceedings Volume 2007, Issue 1, Pages104 – 114 2007 by the American Anthropological Association.

[7] Horst, H., and Miller, D. 2006. The cell phone: An anthropology of communication. Oxford: Berg.

[8] Bakeman, R., and Gottman, J. M. 1986. Observing interaction: An introduction to sequential analysis. Cambridge, UK: Cambridge University Press.

[9] Berners-Lee, T., and Fischetti, M. 1999. Weaving the Web. Harper Collins Publishers.

[10] Goffman, E. 1959. The presentation of self in everyday life. New York: Doubleday.

UAE URBAN IDENTITIES:

Bridging Past Cultural Legacies with Emerging Urban Landscapes

Christopher Mustafa G. Kirwan

Parsons The New School for Design
1 Irving Place P7C
New York, NY 10003
+1 917 226-0014

kirwanc@newschool.edu

ABSTRACT
In this paper, I discuss the opportunity of how new technologies and media can mediate the widening gap between the past cultural legacy and the present and future urbanization in the UAE.

Categories and Subject Descriptors
Urban Design, Adaptive Re-use, Smart Technology, Urban Interface

General Terms
Documentation, Design, Experimentation, Human Factors, Theory

Keywords
Smart Cities, Smart Growth, Sustainable Development, Adaptive Reuse, Urban Regeneration, Urban Branding Systems, Urban Interface, Urban Directories, Ubiquitous Technology, Urban Media, Urban Growth, Urban Planning, Multimedia, Data Visualization, Sensors, Monitoring Systems, Branding and Media Channels.

Outline

1. INTRODUCTION
The rapid growth of the Dubai and UAE real estate market over the last decade and more recently over the last five years, coupled with the quality of life advancement of this new metropolis has captured the attention of the world [6]. This unprecedented growth in urban infrastructure and real estate development has provided a new platform for the study of urbanization [10]. Many architects and urban planners have flocked to Dubai to participate in this design and construction frenzy including Rem Koolhaas OMA [21], Zaha Hadid, Norman Foster (Figure 1. Masdar) and many others. The study of the emerging urban patterns has also been documented in architecture and urban planning studios in many universities, most notably at the Aga Khan Program for Islamic Architecture at MIT and the Harvard GSD. At the same time while Dubai has made great progress, it has also presented a challenging case study for the inherent need to balance between growth and the preservation of cultural identity, a key focus of the Aga Khan Foundation and the subject of this paper in relation to the opportunities new media and urban technologies can play a role.

2. UNPRECEDENTED GROWTH AND RESULTING DISORGANIZATION
During these past few years while Dubai has set the pace, competing city-states throughout the Middle East and North Africa (MENA) Region [11] have attempted to replicate the Dubai model and on a global scale similar mega-scale developments have occurred in other emerging growth hotspots, including Beijing & Shanghai in China, Incheon in South Korea [13] and in other Asian cities. However, when it comes to inspiring vision, leadership and innovative marketing and branding [23], Dubai has clearly captured the imagination and awe of practically everyone under the direction of Dubai's charismatic leader, H.H. Sheikh Mohammed bin Rashid Al Maktoum, The Prime Minister of the UAE.

Notwithstanding such success, the staggering growth in Dubai has also led to rapid urbanization that in many ways has lacked proper planning & integration; and was often undertaken in a piecemeal manner in "mega-blocks of privatized developments" such as found in Media City, Health City, Sports City, etc., all vying for unique recognition with little regard for the total. In fact, in many circumstances buildings and development clusters were fast-track designed and constructed in isolation; leading to the need for continual ad hoc adaptation of the public infrastructure to accommodate the new construction and in the process creating an ongoing state of disorganization.

3. RESPONSE FROM ABU DHABI

As a contrast and possible direct response to Dubai's fragmented growth [22], the government of Abu Dhabi, witnessing at close range the development process, has been able to learn from the many planning mistakes made in Dubai in order to create and promulgate a state-wide master plan and sustainable plan (Plan Abu Dhabi 2030: Urban Structure Framework Plan) [21] that is now being implemented through regulations and other means of enforcement that have rationalized the development process and will more than likely insure a more viable urban plan in the end [1]. One of the best example real estate development projects of this new sustainable consciousness in Abu Dhabi gaining much press, is the zero carbon Masdar City designed by Norman Foster and Partners [17].
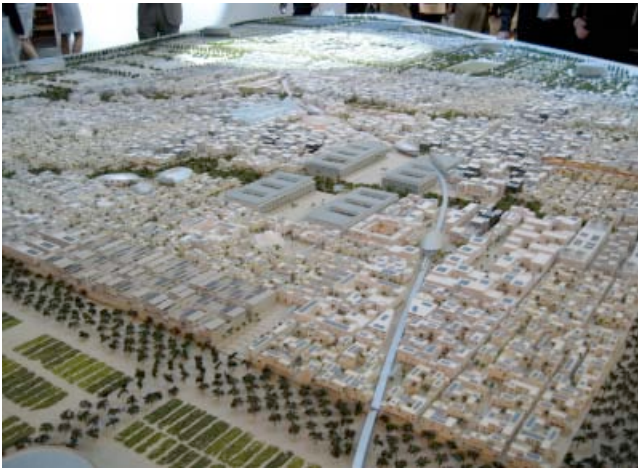

Figure 1. Masdar Urban Plan (model) – Reference [17]

4. TRADEGY OF THE HYPER-INFLATED MARKET

Beginning in the first quarter of 2008, many real estate and financial analysts were concerned about the property market bubble bursting with unprecedented inflation of property values and the dramatic increased cost of living in Dubai. While other surrounding countries remained on a more steady growth curve, Dubai alone was experiencing radical change. As a respond, the government began the process of property regulation, with several laws being put in place, including the mandating of escrow accounts for sales deposits that essentially took precious cash out of the hands of developers [9]. Just as these regulations were taking effect, the global financial collapse began to show up on the horizon, with some predicting the imminent collapse of the market, but never expecting that it would happened so quickly.

By November 2008 with the collapse of the US markets, Dubai began a downward spiral and now finds itself in a completely distressed situation with many projects on hold or abandoned, leaving the immediate future of Dubai in doubts. Strangely, during this same time of crises, the leadership of H.H. Sheikh Mohammad has been noticeably silent, thus exacerbating the situation by allowing speculation and rumors to spread about the Emirate's imminent demise. At the same time, there has been the prevailing notion that "Big Brother Abu Dhabi" would come in and save the day, which has been partially realized with a major recent cash infusion from the government of Abu Dhabi.

5. OPPORTUNITY FOR REFLECTION

With the bubble bursting, the opportunity for a new consciousness has occurred much to the appeal of the local Emirates that in Dubai represent only approximately 15% of the population and many of who have been critical of the speed of development and the deterioration of cultural heritage and the lifestyle of the indigenous Arab Bedouin tribes. While the Bedouins have obviously been instrumental in the leadership and direction of the global growth, there has been a love hate relationship as pertaining to the advancement of the highly urban multicultural metropolis. A recent New York Times article [22] has described this sentiment and has proposed that the current slow down is necessary to allow the local traditions to catch up and have more influence on the development of the new UAE landscape.

6. CULTURAL IDENTITY / SMART GROWTH

The diverse cultural legacies of the desert Bedouin and early coastal urban dwellers mainly from Iran and the Persian civilization has been the background for the new urban landscape that has predominantly turned its back on the rich yet fragile cultural and architectural legacy found in the traditional Dhow seaport villages and pearl diving sites where coastal habitation first developed and thrived [14]. The UAE government has in some cases preserved these historic locations including Al Bastakiya [12], Al Shindagha and Al Ras in Dubai [3] and created some tourist attractions while maintaining some of the archeological areas for the future preservation and advancement of the ancient culture. However these areas have largely remained marginalized in the context of the massive growth taking place in and around these sites that typically occupy prominent central locations where economic and social activity began. An major conference on UAE National Identity was held in Abu Dhabi last year to address the issues of national identity in context of the changing landscape. "Our adherence to the national and indigenous traditions which are rooted in Islamic and Arab values and traditions does not in any way mean that the UAE is parting with the values and constructive interactions of the modern world," stated H.H Sheikh Mansour Bin Zayed Al Nahyan, Minister of Presidential Affairs in his keynote address [24].

7. THE TEAM AND THE PROJECT: WHY THIS MAKES SENSE

In the context of this dichotomy of massive change versus preservation, is an opportunity for research, planning and the design of solutions that mediate this conundrum, while also building on the rich complexity of past-present-future urban and cultural evolution.

While at the same time recognizing the need for sensitivity toward past traditions and form [3], and having the freedom to propose bold ideas, the UAE has a unique opportunity, where in other more established countries, this might not be or have been as possible to plan and implement. This opportunity gave rise to the formation of a project: UAE URBAN IDENTITES, a collaboration between four distinct college institutions and programs - American University of Sharjah, Oxford Brooks University, Parsons The New School for Design, and KAIST University - involving and integrating social anthropology, urban studies, architecture, new media, technology, and product design

to propose site and geographic-based "interventions" utilizing this cross-disciplinary approach.

8. HERITAGE AREAS: PRESERVING YET BRIDGING WITH THE FUTURE

The case study sites include key heritage areas in the UAE [3] located in Sharjah [14], Ras Al-Khaimah and Dubai as starting points of this investigation. Each of these locations are challenging in their own right with context specific cultural, economic, political and environmental conditions requiring unique solutions to mediate between preservation, sustainability and adaptive reuse [25]. However, in each case, there is an opportunity and necessity to develop design solutions that at the same time highlight and promote these locations and re-engage them into the surrounding and emerging urban context, where they are now lying precipitously on the edge of marginalization. The urgency and significance of this reconnection is to allow these heritage areas to be integrated into the public realm and to compete on equal terms with the commercial and residential spaces that envelop them and to allow them to become part of the new ageless identity.

Figure 2. Dubai Bastakiya Heritage Site

9. LOCAL INTERVENTION – GLOBAL STRATEGY

While each heritage site and location has its unique conditions and requires location specific solutions, there is a high-level requirement to connect these sites within an comprehensive media strategy; that positions these heritage areas within the cultural framework of the Emirates as a whole, yet with an individual identity and branding that respects the uniqueness of each Emirate and specific heritage site. The government of Sharjah has been proactive in building on this cultural base and has developed a strong arts and culture program and facilities. This is a solid foundation upon which to link the additional study locations as part of the legacy network and can be promoted on a UAE national level, while being identified also on a local basis.

Part of the research and design development of the proposed project is the study of the branding and communication channels already in place and how these can be enhanced via new technologies and media strategies.

10. PROJECT USING TECHNOLOGY – URBAN INTERFACE

The design challenge is to develop an integrated multi-dimensional monitoring and promotion based media platform and comprehensive branding system we have termed URBAN INTERFACE (see Figure 3. – example of Urban Interface proposed by the author's design and real estate development firm Newwork LLC for the City of Newark, New Jersey) [19]. Urban Interface uses web-based software linking multiple location-based communication and data collection hardware modules. These modules incorporate live media streams providing information generated at the specific locations including activity of passers by and miscellaneous environmental data. This "monitoring" data is then combined with "promotion" media representing both pre-selected content and live broadcast media content representative of the heritage areas and their brand identities. A key asset of the heritage areas are their cultural underpinnings and existing content including the traditional souk marketplace, courtyard dwellings, and cottage industry arts & crafts clusters that provide culturally rich content in their own right that can be co-opted into these desired media campaigns.

Figure 3. Urban Interface Concept, "This is Newark Exhibit"

This fusion of real-time data streams and pre-selected media content is then promoted into the mainstream urban phenomenology; broadcast from the heritage areas into the central business districts and other commercials spaces in Dubai, and the other Emirates, via multiple media channels including government websites, outdoor media venues and kiosks. This site specific media is overlaid, within the same media network, with other data such as information on flights coming in and out of the city, tourists visiting an area and the promotion of the cultural brands – thus cross-selling the broader urban data and UAE brand content with location specific content, reinforcing the link between the cultural heritage sites and the mainstream environments in UAE.

11. GOALS / CONCLUSIONS

While much focus has been placed on high-tech solutions and "über contemporary" designs and developments in the UAE and the world stage including exciting Smart Cities initiatives in South Korea [16] and Sustainable Development burgeoning around the globe, very little focus and discussion has centered around the presentation of historical sites and the true notion of sustainability of the environment and cultural landscape.

The UAE URBAN IDENTITIES project is an attempt to reconcile the dichotomies of the past and the future with an attempt to instigate the application of new media technologies to facilitate the creation of an Urban Interface – a monitoring and promotion system that is dynamic, commercially viable and a complex fusion of cultural content, architecture, urban design and interactive media. The project is now in the design and development phase with a planned exhibition and event for Fall 2009 at Cityscape Dubai where it will surely present a contrasting image to all of the surrounding new mega-developments. The exhibition will center around an interactive 3D map that highlights the key heritage sites in the UAE and physical models of each of the heritage sites. Users will be able to explore media content projected on surrounding surfaces by interacting with motion sensors and touch sensitive surfaces that trigger the content. A real-time data feed will be established in at least one of the heritage sites to demonstrate the live data aspect of the Urban Interface.

Figure 4. Interactive Exhibition Concept for Cityscape Dubai

12. ACKNOWLEDGMENTS

13. REFERENCES

[1] Abu Dhabi, A Model of Sustainability, Middle East Business Intelligence Report, April 2009.

[2] Al Fahim, Sulaiman, "Brand Builder", 2008

[3] Al-Rustumani. 1991. Dubai and Its Architectural Heritage". Al-Safeer, Dubai,

[4] Antoniou, Jim. 1984. Urbanisation and Construction in the Arabian Peninsula.

[5] Boussa, Djamel. 2000. Why Preserve the Past? (Paper presented for the second Arab Gulf Conference, Al Ain: UAE, March 2000).

[6] Bukhash, Rashad. 2004. Architecture Re-introduced: New Projects in Dubai - United Arab Emirates, 2004.

[7] Cityscape Abu Dhabi, 2009. Abu Dhabi: Building the Future, Cityscape Magazine, April 2009

[8] Davis, Mike. & Monk, D.B. 2007. Evil Paradises, 2007.

[9] Ditcham, Robert. 2007. Dubai Issues Escrow Account Law for Property Sector, Gulf News, July 2007.

[10] Dubai Urban Area Structure Plan (Dubai Municipality, 1993-2012).

[11] Fox. John, Sabbah, N.M. & Al Mutawa, M.(ed.). 2006. Globalization and the Gulf, 2006.

[12] Gray, Simon. 1994. Bastakia Conservation Project. Dubai, Dubai Municipality, 1994.

[13] Incheon City, Smart Cities, South Korea, http://incheon.go.kr/.

[14] Jackson, Peter. 2008. Heart of Sharjah: An overview of the historical development of a Gulf Coastal settlement, Iccrom/Athar, November 2008.

[15] Koolhaas, Rem, Khoubrou, Mitra, Bouman, Ole. 2007. Al Manakh, Analysis of Developments Along the Gulf: A Guide, a Survey, an Agenda, 2007.

[16] Lee, Youngwhan Nick, Imaginations, Implementations, Innovations in Ubiquitous Information Technologies and Applications at Konkuk University, Institute of Ubiquitous Information Technologies and Applications (UbITA)

[17] Masdar Plan, The Economist, July 2008

[18] Mojib, Imran. 2002. Preserving the Past for Posterity. In The Gulf Today (12 October 2002): 4.

[19] Newwork LLC, "This is Newark! Exhibition", April 2009 (Figure. 3)

[20] Ouroussoff, N. 2008. City on the Gulf: Koolhaas Lays Out a Grand Urban Experiment in Dubai, The New York Times Review, March 3, 2008

[21] Plan Abu Dhabi 2030: Urban Structure Framework Plan http://www.abudhabi.ae

[22] Slackman, Michael. 2008. Emirates See Fiscal Crisis as Chance to Save Culture, The New York Times, Nov. 12, 2008.

[23] Tosches, Nick. 2006. Dubai is the Limit, Vanity Fair, June 2006.

[24] WAM, Emirates News Agency, UAE National Identity Conference kicks off, April 4th, 2008 http://www.uaeinteract.com/docs/UAE_National_Identity_Conference_kicks_off/29614.htm.

[25] Warren, J. 1982. Integrating Traditional Areas into the Modern Urban Fabric in Adaptive Reuse, Proceeding of Seminar 3, Designing in Islamic Cultures, Cambridge, Mass, 1982.