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Handbook of Research on Urban Informatics: The Practice and Promise of the Real-Time City

edited by Marcus Foth

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Chapter I

Urbane-ing The City: Examining and Refining the Assumptions behind Urban Informatics / *Amanda Williams*¹, *Erica Robles*², and *Paul Dourish*¹

1 University of California, Irvine, USA

2 Stanford University, USA

This chapter critically examines the notion of ‘the city’ within urban informatics. Arguing that there is an overarching tendency to construe the city as an economically and spatially distinct social form, it reviews a series of system designs manifesting this assumption. Systematically characterizing the city as a dense ecology of impersonal social interactions occurring within recognizably public places, this construction can be traced to turn-of-the-century scholarship about the metropolis. An alternative perspective which foregrounds the *experience* rather than the *form* of the metropolis is advocated. Users become actors embedded in global networks of mobile people, goods, and information, *positioned* in a fundamentally heterogeneous and splintered milieu. Grounding this approach in a preliminary study of mobility practices in Bangkok, Thailand, the chapter illustrates how urban informatics might refine its subject, accounting for local particularities between cities as well as the broader global networks of connection between these sites.

Chapter II

To Connect and Flow in Seoul: Ubiquitous Technologies, Urban Infrastructure and Everyday Life in the Contemporary Korean City / *Jaz Hee-jeong Choi*¹ and *Adam Greenfield*²

1 Queensland University of Technology, Brisbane, Australia

2 Interactive Telecommunications Program, New York University, USA

Once a city shaped by the boundary conditions of heavy industrialisation and cheap labour, within a few years Seoul has transformed itself to one of the most connected and creative metropolises in the world, under the influence of a new set of postindustrial prerogatives: consumer choice, instantaneous access to information, and new demands for leisure, luxury, and ecological wholeness. The Korean capital stands out for its spatiotemporally compressed infrastructural development, particularly in the domain of urban informatics. This chapter explores some implications of this compression in relation to Seoulites’ strong desire for perpetual connection, a desire that is realised and reproduced through ubiquitous technologies connecting individuals both with one another and with the urban environment itself.

Chapter III

Creating an Analytical Lens for Understanding Digital Networks in Urban South Africa / *Nancy Odendaal*

University of KwaZulu-Natal, Durban, South Africa

This chapter begins with the premise that ICT can only be considered a meaningful development tool if it is appropriated as ongoing input into the day to day decision-making of the poor. It is at this scale – the local, the individual, the social – that the appropriation of digital technologies is examined. The social appropriation of technology is considered in tandem with the network strategies people employ to manage and access resources. A conceptual bridge between the theoretical foundations of actor-network theory and the more contemporary writings on the African city is constructed to posit a theoretical lens for understanding digital networks in South African cities.

Section II: Participation and Deliberation

Chapter IV

Place Making Through Participatory Planning / *Wayne Beyea, Christine Geith, and Charles McKeown*

Michigan State University, USA

Community planning is facing many challenges around the world such as the rapid growth of megacities as well as urban sprawl. The State of Michigan in the United States is attempting to re-invent itself through place making by using participatory planning supported by new information tools, models and online training. The Michigan State University Land Policy Institute framework for place making includes *Picture Michigan Tomorrow*, an informatics initiative to democratize data and incorporate it into scenario planning methodologies and tools, and *Citizen Planner*, an on-ground and online training program for local planning officials. Still in the early phases of implementation, these initiatives provide promising models for use in other regions of the world that seek consensus among citizens, developers and government on the vision and plan for their communities.

Chapter V

TexTales: Creating Interactive Forums with Urban Publics / *Mike Ananny¹ and Carol Strohecker²*

1 Stanford University, USA

2 University of North Carolina, Winston-Salem, USA

This chapter describes the design and installation of a new kind of public opinion forum – *TexTales*, a public, large-scale interactive projection screen – to demonstrate how public city spaces can become sites for collective expression and public opinions can be considered social constructions. The design and implementation of *TexTales* installations is analyzed and a number of interaction design elements critical for

designing expressive urban spaces are identified such as, starting “intermodal” conversations; authoring for nomadic, unfamiliar audiences; distributing public discourse across mediated and physical space; and editing and censoring dialog to ensure that it reflects the norms and values of forum designers.

Chapter VI

An Event-driven Community in Washington, DC: Forces that Influence Participation / *Jenny Preece*

University of Maryland, USA

This chapter describes a small networked community in which residents of an apartment building in Washington DC, USA supplement their face-to-face social interactions with a Yahoo email listserver. Analysis of over 460 messages that have been archived since July 2000 when the list began reveals that the same issues drive participation on the list as off the list. Threats to safety, high rent increases, and changes in management practices, such as parking regulations and access to facilities, motivate communication on and offline. Furthermore, those who are most active online are typically most active offline. Activity on the list is strongly fuelled by interest and discussion around local events, hence the term event-driven, and is promoted by activist tenants. Friendly notes about new restaurants, bird observations and other niceties may help a little to create a sense of overall community but they do little to motivate online participation.

Chapter VII

Moments and Modes for Triggering Civic Participation at the Urban Level / *Fiorella De Cindio, Ines Di Loreto, and Cristian Peraboni*

Università degli Studi di Milano, Italy

After more than a decade of e-participation initiatives at the urban level, what remains obscure is the alchemy, that is, the ‘arcane’ combination of elements that trigger, and keep alive, citizens’ involvement in major decisions that affect the local community. The experiences of the Community Informatics Lab with the Milan Community Network since 1994 and its two more recent spin-off initiatives enables this chapter to provide a tentative answer to this question. The chapter presents these experiments and looks at election campaigns and protests as triggers for (e-)participation. It also discusses these events as opportunities to engender more sustained participation aided by appropriate technology tools such as software deliberately conceived and designed to support participation and managed with the required expertise.

Section III: Engagement of Urban Communities

Chapter VIII

Fostering Communities in Urban Multi-cultural Neighbourhoods: Some Methodological Reflections / *Michael Veith, Kai Schubert, and Volker Wulf*

University of Siegen, Germany

Societies face serious challenges when trying to integrate migrant communities. One-sided solutions do not pay tribute to the complexity of this subject and a single academic discipline provides no proper methodological approaches to the field. An inter-cultural computer club in an urban multi-cultural neighbourhood illustrates these phenomena lively: appropriate argumentations and models can only be found in a theoretical net of scientific disciplines. Categories in a complex socio-cultural field have to be uncovered. These categories can be explained with the help of the theoretical net. This chapter develops a three-dimensional model of combining empirical tools with the research strategy of participatory action research and grounded theory as a guide to theorizing the field. This model is introduced here as a means of socio-technical design and development.

Chapter IX

Beyond Safety Concerns: On the Practical Applications of Urban Neighbourhood Video Cameras / *Victor M. Gonzalez¹, Kenneth L. Kraemer², and Luis A. Castro¹*

1 University of Manchester, UK

2 University of California, Irvine, USA

The practical use of information technology devices in domestic and residential contexts often results in radical changes from their envisioned *raison d'être*. This study focuses on the context of household safety and security, and presents results from the analysis of the usage of video cameras in the public areas of an urban neighbourhood in Tecámac, Mexico. Moving beyond the original envisioned purpose of safety, residents of the community engaged in a process of technology appropriation, finding novel applications for the security cameras. These uses included supporting coordination among family members, providing enhanced communication with distant friends and family, looking after minors while playing outside, and showing the household to friends and colleagues. Results illustrate that success in information technologies is a dynamic phenomenon and that technology appropriation has to be understood as a phenomenon that occurs at the level of the application of the device, rather than at the level of the device itself.

Chapter X

The Figmentum Project: Appropriating Information and Communication Technologies to Animate our Urban Fabric / *Colleen Morgan and Debra Polson*

Australasian Cooperative Research Centre for Interaction Design, Australia

This chapter explores how we may design located information and communication technologies (ICTs) to foster community sentiment. It focuses explicitly on possibilities for ICTs to create new modalities of place through exploring key factors such as shared experiences, shared knowledge and shared authorship. To contextualise this discussion in a real world setting, this chapter presents FIGMENTUM, a situated generative art application that was developed for and installed in a new urban development. FIGMENTUM is a non-service based application that aims to trigger emotional and representational place-based communities. Out of this practice-led research comes a theory and a process for designing creative place-based ICT's to animate our urban communities.

Chapter XI

Voices from Beyond: Ephemeral Histories, Locative Media and the Volatile Interface / *Barbara Crow*¹, *Michael Longford*¹, *Kim Sawchuk*², and *Andrea Zeffiro*²

1 York University, Toronto, Canada

2 Concordia University, Montreal, Canada

This chapter focuses on two projects, *Urban Archaeology: Sampling the Park* and *The Haunting*. The phrase *voices from beyond* is used as a trope in our reflections upon the deployment of mobile media technologies and use of locative media practice to intentionally blur past and present moments. Archival fragments and ghostly images are presented via hand-held devices to use the power, potential and public intimacy of media dependent upon the presence of electromagnetic spectrum. In addition to key texts on locative media, the chapter draws on Benjamin's understanding of history as a sensibility whereby the past and present co-mingle in the minds and embodied memories of human subjects, Darin Barney's notion of the "vanishing table" as an alternative means for engagement in technologically mediated zones of interaction, and writing on and communications theory that deals with the spectral qualities of new media.

Chapter XII

Embedding an Ecology Notion in the Social Production of Urban Space / *Helen Klaebe*, *Barbara Adkins*, *Marcus Foth*, and *Greg Hearn*

Queensland University of Technology, Brisbane, Australia

This chapter defines, explores and exemplifies research at the intersection of people, place and technology in cities. It first theorises the notion of ecology in the social production of space to respond to the quest of making sense of an environment characterised by different stakeholders and actors as well as technical, social and discursive elements that operate across dynamic time and space constraints. Second, it describes and rationalises a research approach which is designed to illuminate from three different perspectives the processes at play in the social production of space. The application of this approach is discussed through a case study of community networking and community engagement in an Australian urban renewal site. Three specific interventions that are loosely positioned at the exchange of each perspective are then discussed in detail, namely: *Sharing Stories*; *Social Patchwork* and *History Lines*; and *City Flocks*.

Section IV: Location, Navigation and Space

Chapter XIII

Cityware: Urban Computing to Bridge Online and Real-world Social Networks / *Vassilis Kostakos* and *Eamonn O'Neill*

University of Bath, UK

This chapter describes a platform that enables the systematical study of online social networks alongside their real-world counterparts. The system, *Cityware*, merges users' online social data, made available through Facebook, with mobility traces captured via Bluetooth scanning. Furthermore, the system enables users to contribute their own mobility traces, thus allowing users to form and participate in a community. In addition to describing *Cityware*'s architecture, the chapter discusses the type of data that is being collected, and the analyses the platform enables, as well as users' reactions and thoughts.

Chapter XIV

Information Places: Navigating Interfaces Between Physical and Digital Space /
Katharine S. Willis and Jens Geelhaar

Bauhaus-University Weimar, Germany

In our everyday lives, we are surrounded by information which weaves itself silently into the very fabric of our existence. Much of the time we act in the world based on recognising qualities of information which are relevant to us in the particular situation we are in. These qualities are very often spatial in nature, and in addition to information in the environment itself we also access representations of space, such as maps and guides. Increasingly such forms of spatial information are delivered on mobile devices, which enable a different relationship with our spatial world. This chapter discusses an empirical study which attempts to understand how people acquire and act on digital spatial information. In conclusion it draws on the outcomes of a study to discuss how we might better embed and integrate information in place so that it enables a more relational and shared experience in the interaction between people and their spatial setting.

Chapter XV

A Visual Approach to Locative Urban Information / *Viktor Bedö*

University of Pécs, Hungary

This chapter proposes that locative urban information necessitates the use of visual instruments, such as maps integrated into spatial annotation systems. The thesis is that the dynamics of the movement and behavior of messages appearing, disappearing, and spreading on the urban maps provide clues as to what extent a specific type of information is dependent on urban space for context, that is, its level of location-sensitivity. A parallel is drawn between the interpretation of dynamic patterns appearing on urban maps and of scientific discovery supported by the use of visual instruments. In order to illustrate how the question of locativity arises when developing technologies for urban life, an examination of *BlueSpot*, a locative media project in Budapest, is provided.

Chapter XVI

Navigation Becomes Travel Scouting: The Augmented Spaces of Car Navigation Systems / *Tristan Thielmann*

University of Siegen, Germany

Car navigation systems, based on ‘augmented reality’, no longer direct the driver through traffic by simply using arrows, but represent the environment true to reality. The constitutional moment of this medium is the constant oscillation between environmental space and two-dimensional projection space. Temporal information in addition to spatial information is becoming increasingly important with features such as real time gridlock reports aided by highway sensors or guidance to the nearest event. Does the future lie in the fusion of travel guides and navigation systems? This chapter argues that future developments in urban informatics resulting from the convergence in cartographic, media and communication technologies can be inferred based on the increasing phenomenon of mobile augmented reality applications.

Chapter XVII

QyoroView: Creating a Large-Scale Street View as User-generated Content / Daisuke Tamada and Hideyuki Nakanishi

Osaka University, Japan

A lot of street view services, which present views of urban landscapes, have recently appeared. The conventional method for creating street views requires on-vehicle cameras. This chapter proposes a new method, which relies on people who voluntarily take photos of an urban landscape using a system called *QyoroView*. The system receives photos from users, adjusts the photos’ position and orientation, and finally synthesizes them to generate a street view. The chapter reports on two experiments in which the subjects generated a street view using our system.

Chapter XVIII

Virtual Cities for Simulating Smart Urban Public Spaces / Hideyuki Nakanishi¹, Toru Ishida², and Satoshi Koizumi¹

1 Osaka University, Japan

2 Kyoto University, Japan

Many research projects have studied various aspects of smart environments including smart rooms, home, and offices. Few projects, however, studied smart urban public spaces such as smart railway stations and airports due to the lack of an experimental environment. This chapter proposes virtual cities as a testbed for examining the design of smart urban public spaces. An intelligent emergency guidance system for subway stations is presented. A virtual subway station platform is used to analyze the effects of the system. The chapter argues that simulations in virtual cities are useful to pre-test the design of smart urban public spaces and estimate the possible outcome of real-life scenarios.

Chapter XIX

The Neogeography of Virtual Cities: Digital Mirrors into a Recursive World / Andrew Hudson-Smith, Richard Milton, Joel Dearden, and Michael Batty

Centre for Advanced Spatial Analysis, University College London, UK

As cities have become more ‘computable’, capable of manipulation through their digital content, large areas of social life are migrating to the web. This chapter focuses

on the virtual city in software, presenting speculations about how such cities are moving beyond the desktop to the point where they are rapidly becoming the desktop itself. But a desktop with a difference, a desktop that is part of the web, characterized by a new generation of interactivity between users located at any time in any place. This chapter first outlines the state of the art in virtual city building drawing on the concept of mirror worlds and then comments on the emergence of Web 2.0 and the interactivity that it presumes. It characterizes these developments in terms of virtual cities through the virtual world of *Second Life*, showing how such worlds are moving to the point where serious scientific content and dialogue is characterizing their use often through the metaphor of the city itself.

Section V: Wireless and Mobile Culture

Chapter XX

Codespaces: Community Wireless Networks and the Reconfiguration of Cities /
Laura Forlano

Columbia University, New York, USA

This chapter introduces the role of community wireless networks (CWNs) in reconfiguring people, places and information in cities. CWNs are important lead users and innovators of mobile and wireless technologies in their communities. Their identities are geographically-bounded and their networks that they imbued with social, political and economic values. While there has been much discussion of the networked, virtual and online implications of the Internet, the material implications in physical spaces have been overlooked. By analyzing the work of CWNs in New York and Berlin, this chapter reconceptualizes the interaction between technologies, spaces and forms of organizing. This chapter introduces the concept of codespaces in order to capture the integration of digital information, networks and interfaces with physical space.

Chapter XXI

Home is where the hub is? Wireless infrastructures and the nature of domestic culture in Australia / *Katrina Jungnickel¹ and Genevieve Bell²*

1 INCITE, Sociology Department, Goldsmiths College, University of London, UK

2 User Experience Group, Digital Home Group, Intel Corporation, USA

From WiFi (802.11b) with its fixed and mobile high-speed wireless broadband internet connectivity to WiMAX (802.16e), the newest wireless protocol, extending the reach of WiFi across longer distances and more difficult terrain, new wireless technologies are increasingly thought to impact the ways in which we encounter social spaces in public, civic and commercial sites within large urban centers. This chapter explores how and to what extent these new wireless technologies might also be reconfiguring and reorganizing domestic practice and social relations. Drawing on a year-long ethnographic study of WiFi and WiMax provisioned homes in a major Australian metropolitan center, the chapter argues that new wireless infrastructures are impacting how people imagine and use mobile devices, computers and the internet

in and around the home but not in ways wholly anticipated by commercial internet service providers.

Chapter XXII

Mapping the MIT Campus in Real-time Using WiFi / *Andres Sevtsuk, Sonya Huang, Francesco Calabrese, and Carlo Ratti*

SENSEable City Laboratory, Massachusetts Institute of Technology, USA

This chapter presents the *iSPOTS* project, which collects and maps data of WiFi usage on the Massachusetts Institute of Technology campus in Cambridge, Boston. Instead of simply mapping the locations of WiFi availability, the project is possibly the first to use and analyze log files from the Institute's Internet service provider and to produce spatial visualizations of the observed activity in real time. The aim is to create a better understanding of the daily working and living patterns of the MIT academic community which changes due to the emergence of WiFi itself. The MIT wireless IEEE 802.11 network consisting of 3,000 access points, one of the largest of its kind, offers a privileged environment for this research and, in perspective, can provide a test bed for entire cities.

Chapter XXIII

Supporting Community With Location-Sensitive Mobile Applications / *John M. Carroll and Craig H. Ganoë*

Center for Human-Computer Interaction, The Pennsylvania State University, USA

This chapter discusses the vision, plan, and status of a research project investigating community-oriented services and applications, comprising a wireless community network, in State College, Pennsylvania, USA. The project specifically investigates new possibilities afforded by location-sensitive and wireless networking access with respect to community engagement and informal learning, as well as broader changes in community attitudes and behaviors associated with the deployment of this new infrastructure.

Chapter XXIV

From Social Butterfly to Urban Citizen: The Evolution of Mobile Phone Practice / *Christine Satchell*

Interaction Design Group, The University of Melbourne, Australia

This chapter presents the findings from a three-year study into mobile phone use in urban culture. The study revealed that for a new generation the mobile was integral in the formation of fluid social interactions and had accelerated urban mobility. Users once restrained by pre-made plans were able to spontaneously traverse the city and suburbs, swarming between friendship groups and activities. Distinct user archetypes were emerging from these mobile phone driven sub-cultures whose practices were bringing about fundamental changes in social mores with respect to engagement and commitment, to notions of fluid time versus fixed time and ultimately to urban mobility. Recent developments in mobile phone design reveal the potential for a new generation of people to recontextualize their use in a way that moves beyond 'the

social', as they utilise sensors and data capturing and sharing functionalities in new mobile devices to augment their 'social butterfly' identity with an ideology of a 'socially conscious urban citizen'.

Section VI: The Not So Distant Future

Chapter XXV

u-City: The Next Paradigm of Urban Development / *Jong-Sung Hwang*

National Information Society Agency, South Korea

u-City is South Korea's answer to urban community challenges leveraging ubiquitous computing technology to deliver state-of-the-art urban services. Korea's experience designing and constructing u-City may be a useful benchmark for other countries. This chapter defines the concept of u-City and analyzes the needs that led Korea to embark on the u-City project ahead of others. It examines the opportunities and challenges that the nation faces in the transition stage. What has enabled Korea to pioneer the u-City concept is the development of IT infrastructure and the saturation of the IT market on the one hand, and the balanced national development strategy on the other hand. Success of u-City requires a national capability of designing forward-looking institutions to enable better cooperation among stakeholders, the establishment of a supportive legal framework and promotion of technology standardization.

Chapter XXVI

Urban Informatics in China: Exploring the Emergence of the Chinese City 2.0 / *Dan Shang¹, Jean-François Doulet², and Michael Keane³*

1 France Telecom Research & Development, Beijing, China

2 Department of Geography, Université de Provence, Aix-Marseille, France

3 ARC Centre of Excellence for Creative Industries and Innovation, Australia

This chapter examines the development of information and communication technologies in urban China, focusing mainly on their impact on social life. The key question raised by this study is how the internet and mobile technologies are affecting the way people make use of urban space. The chapter begins with some background to China's emergence as a connected nation. It then looks at common uses of web-based and mobile phone technologies, particularly bulletin boards, SMS and instant messaging. The chapter then presents findings of recent research that illustrates communitarian relationships that are enabled by mobility and the use of technologies. Finally, these findings are contextualized in the idea of the City 2.0 in China.

Chapter XXVII

WikiCity: Real-time Location-sensitive Tools for the City / *Francesco Calabrese, Kristian Kloeckl, and Carlo Ratti*

SENSEable City Laboratory, Massachusetts Institute of Technology, USA

The real-time city is now real! The increasing deployment of sensors and handheld electronic devices in recent years allows for a new approach to the study and exploration of the built environment. The WikiCity project deals with the development of real-time location-sensitive tools for the city and is concerned with the real-time mapping of city dynamics. This mapping, however, is not limited to representing the city, but becomes also instantly an instrument for city inhabitants to base their actions and decisions upon in a better informed manner, leading to an overall increased efficiency and sustainability in making use of the city environment. This chapter discusses the WikiCity Rome project, which was the first occasion for implementing some of WikiCity's elements in a public interface – it was presented on a large screen in a public square in Rome.

Chapter XXVIII

Citizen Science: Enabling Participatory Urbanism / *Eric Paulos*¹, *RJ Honicky*², and *Ben Hooker*¹

1 Intel Research Berkeley, USA

2 University of California, Berkeley, USA

This chapter presents an important new shift in mobile phone usage – from communication tool to ‘networked mobile personal measurement instrument’. It explores how these new ‘personal instruments’ enable an entirely novel and empowering genre of mobile computing usage called *citizen science*. It investigates how such citizen science can be used collectively across neighborhoods and communities to enable individuals to become active participants and stakeholders as they publicly collect, share, and remix measurements of their city that matter most to them. It further demonstrates the impact of this new *participatory urbanism* by detailing its usage within the scope of environmental awareness. Inspired by a series of field studies, user driven environmental measurements, and interviews, the chapter present the design of a working hardware system that integrates air quality sensing into an existing mobile phone and exposes the citizen authored measurements to the community – empowering people to become true change agents.

Chapter XXIX

Extreme Informatics: Toward the De-saturated City / *Mark Shepard*

Departments of Architecture and Media Study, University at Buffalo, USA

What happens to urban space given a hypothetical future where *all* information loses its body, that is, when it is offloaded from the material substrate of the physical city to the personal, portable, or ambient displays of tomorrow's urban information systems? This chapter explores the spatial, technological and social implications of an *extreme* urban informatics regime. It investigates the total virtualization of the marks, signage, signaling and display systems by which we locate, orient ourselves, and navigate through the city. Taking as a vehicle a series of digitally manipulated photographs of specific locations in New York, this study analyzes the environmental impact of a pervasive *evacuation* of information – at various sites and scales – from the sidewalks, buildings, streets, intersections, infrastructures and public spaces of a fictional future De-saturated City.

Afterword / *Roger Burrows*

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Foreword

Unlike most scholarly texts, let us begin with some definitions. Since we are in relatively uncharted territory, it is worth a short divergence.

Webster's online dictionary defines *urban* as "of, relating to, characteristic of, or constituting a city". *Informatics*, a bit more obtuse, is "the collection, classification, storage, retrieval, and dissemination of recorded knowledge treated both as a pure and as an applied science". So how would we synthesize these terms to define *urban informatics*? One version might read "the collection, classification, storage, retrieval, and dissemination of recorded knowledge of, relating to, characteristic of, or constituting a city". This definition emphasizes information as the dominant structural aspect or reason for being – that information is literally what constitutes a city. What is left of Carthage, after all, but legends? Another possible definition for *urban informatics* is "the collection, classification, storage, retrieval, and dissemination of recorded knowledge *in* a city". This definition highlights the physical city's persistent role as a container for information-based human activity. Either way, both definitions illustrate that information processing is an age-old function of cities – as Mumford (1961) told, writing and urbanization were more or less simultaneous historical developments.

Taking a long view of urban informatics, the simultaneous urbanization and global economic integration we are currently experiencing can best be seen as a refinement of the city as a system for information processing. In the pre-electronic era, face-to-face proximity and the clustering of functions was the most efficient means of replicating, transmitting and searching for information in social and economic networks. Over time, new tools augmented this function, but in a sense the city itself is our original and greatest information technology.

Over the last two decades, urban scholars have built a powerful case behind the hypothesis that advances in informatics have been a powerful force behind urbanization. The literature on "global cities", most notably, argues that the centralization of high-level decision-making in a handful of global cities, augmented by information and communications technology, is how globalization actually is enacted. Indeed, urban informatics does play a critical role in accelerating every step of this process – from information retrieval ("what is going on in Nigeria?") to analysis and decision-making ("should we invest in more oil production?") to dissemination ("drill that well!").

But while a historical view tells us that urban informatics is not a new thing – it is as innate a part of urbanity as anything else we study, and has been used since the dawn of cities to reinforce political and economic control – there is something unique about this moment in history. It seems that after 50 years of incubating digital information technologies on the desktop, we are now at a point where they are to become inextricably woven into the everyday social and economic life of dwellers in every city on the planet. On top of the centralized informatics infrastructure of the 20th century, we are juxtaposing layers of tools for material sensing and broad, decentralized cooperation among groups.

The first big shift, the pervasive spread of sensing in urban environments is already reshaping both the day-to-day and long-term processes of urbanization. While humans still set the boundaries, more and more of the critical life support systems of the city are instrumented to both sense and make sense of the world around them. Like Frankenstein's monster, the physical fabric of cities is waking up and becoming aware of itself.

Much of the sensing of urban settings today comes from the top-down. Congestion pricing, dynamic power grids and biometric surveillance are all examples of informatics systems that manage the status quo. But as many examples in this book describe, as sensing technology becomes more broadly diffused, it can be leveraged for disruptive uses that challenge established views of the city. For instance, inexpensive networked sensing embedded in mobile devices recasts urban dwellers as an agile, dense swarm of pollution and traffic probes.

A parallel shift is the lightening-up of the informatics infrastructure, in favor of more decentralized, bottom-up frameworks. A popular metaphor for the industrial city was the machine. But if the city as machine has given way to the city as computer, what we are living in more closely resembles the messy collective capability of the Internet than a mainframe. In an ironic twist, information systems have evolved to become much like our most successful cities – open and modularized platforms on which human activity can take place – and less like master-designed utopias. In analogy form: Brasilia is to Big Blue, as Los Angeles is to Web 2.0. In a sense, by becoming more “cosmopolitan”, tolerant of differences and inter-connected, information systems are thriving.

This volume then comes along at an opportune moment – to reflect on this historic moment, and to chart both directions of change and specific principles and techniques for how to proceed into unknown territory. For the first time, I believe, this volume conveys the sense that we are starting to actually “see” informatics transforming cities before our eyes. When he was tearing apart New York City to make room for the automobile, power broker Robert Moses was reputed to announce, “When you operate in an overbuilt metropolis, you have to hack your way with a meat ax.” But today's urban informatics effect change at the other end of the spectrum, through persuasion, surveillance, personalization and contextualization. Instead of rewriting space with a few large-scale strokes, they allow us to re-engineer an infinite number of small-scale relationships. But ubiquitous sensing is giving us the ability to sense, map and visualize these previously invisible processes.

What truly marks this volume more than any other on the topic, however, are the clear signs that scholars working in this area are developing transdisciplinary approaches to their research. In 2005, the Institute for the Future conducted a 50-year scan of future trends in science and technology for the UK government's Department of Trade and Industry (now the Department of Trade and Innovation). One of the eight high-level forecasts to emerge from this year-long effort, the idea of transdisciplinarity essentially meant that rather than putting together teams of specialists from established fields, we would see ever more young scholars seek training in multiple disciplines to develop new approaches to particularly messy or difficult problems. As author Howard Rheingold described it, “transdisciplinarity goes beyond bringing together researchers from different disciplines to work in multidisciplinary teams. It means educating

researchers who can speak languages of multiple disciplines – biologists who have an understanding of mathematics, mathematicians who understand biology” (IFTF, 2006, p. 31).

The ability to easily form new communities around topics is a key driver of transdisciplinarity – historically, “disciplines have been social as well as intellectual institutions. They’ve helped define what research problems and areas are important; identified who is worth knowing; rewarded innovative work; and helped allocate financial and human resources. Now though, an emerging cluster of online services offer scientists the means to find colleagues working on similar problems, irrespective of geography and institutional affiliation. Social software tools allow individuals to self-organize around common interests. Digital preprint services, wikis, and Web logs offer a spectrum of means to rapidly publish new research.” (IFTF, 2006, p. 31).

This book is the result of just such a process unfolding, through a dialogue that without electronic sustenance would have been unlikely just a decade ago. Ten years ago, this would have been two or more separate books – one for social scientists, one for information scientists, yet another for architects and urban designers. As I sat down to write this foreword, I considered the traditional task of trying to draw out common themes from the diversity of manuscripts. Until I realized that to do so would completely miss the point of what the authors have accomplished. This group of authors has stepped outside their disciplinary silos to engage in a dialogue that I suspect many will be loathe to return from.

Not having been around to experience it, as best I can tell from the literature, the last great burst of interest in urban informatics seems to have occurred in the late 1960s and early 1970s, about the time that computing began to be introduced on a large scale in government and business. The excitement about using computers to improve data analysis and even do predictive modeling of urban systems was widespread. In fact, my own organization, the Institute for the Future, was established in 1968 at Wesleyan College with a grant from the Ford Foundation to do computer-based urban modeling. These efforts soon fell apart, as the underestimated complexity of the effort became apparent. In a sense, the undelivered promises of that era’s technocracy have driven much of the urban informatics research agenda since.

Transdisciplinarity is a beacon – instead of ignoring the input of colleagues across the table, it will be our own minds offering alternate hypotheses. Instead of blindly pursuing technological possibilities, social research is informing the definition of computational problems. The future research agenda both stated and implied by the contributions in this volume suggest decades of future work, and that is why I believe this new wave of urban informatics research will be sustained.

In conclusion, I like to think that this collaboration between urban scholars and information scientists will be more nuanced and more productive, building on the mistakes of the past collaboration. I also like to think that this will in the end result in better cities – more energy efficient, more fun, more just. The timing is certainly right. Urban planning is well into an undeclared crisis of thought leadership – despite it being one of the best avenues for dealing with global challenges like climate change and migration. Information science is poking its head out of the burrow and seeing the

enormous intellectual challenge of expanding what worked on the desktop of the elites, to a diverse and mobile urban population.

It's worth speculating on the long-term impact of this developing body of research. Unlike the 20th century's urbanization, the big story by mid-century won't be the changes to the hardware. The mega-buildings of Shanghai and Dubai are just that – over-sized versions of the familiar 20th century forms borrowed from Chicago and Manhattan. Coal-fired or solar-powered, we will still be living in an energy-intensive civilization powered by electricity – billions more of us than ever.

But where we will see lots of change is in the software that shapes cities. Embedded sensing will replace a lot of human watchers, and watch things on a frequency and scale we can barely imagine. But what will be important is how these abundant data streams provide a new ability to model and simulate very complex urban systems in real-time. Whereas today, urban managers and planners react on the time cycle of a census, by mid-century real-time dashboard and predictive models will rule the trade. Already today, firms like Inrix provide fine-grained traffic forecasts for dozens of metropolitan areas in the United States.

Advances in the tools we have for “seeing” cities, from the first maps to the latest in satellite imagery, have always had major impacts on how we define problems, opportunities and aspirations. Sherman Fairchild, the father of aerial photography, described the impact of his invention (1924):

[It] shows the city with the minutest detail. It shows every structure from contractor's temporary tool-shed to skyscraper; back-yards, gardens and parks with every tree and bush visible; avenues and alleys, streets and unrecorded foot-paths; big league ball parks; water-front clubs, with their yachts and motor boats; the boardwalk of Coney Island, and crowds of people appearing like small black dots.

As Campanella (2001) describes in his history of the Fairchild Aerial Survey Company, the aerial perspective unleashed a wave of re-thinking urbanism:

If Le Corbusier was rhapsodic about the airplane's possibilities, he was shocked by what it revealed of the city. More than anything, it was the aerial view that ratified his conviction about the bankruptcy of the urban-architectural past. Rather than unfold in new light the wondrous legacy of urban civilization, the airplane supplied Corbusier with damning proof that the city of man was deeply pathological. The airplane peeled back the shrouds of the city, revealed its wrinkles and warts to Corbusier's unforgiving eye.

In essence, this new perspective granted by aerial photography rendered cities as abstract expressions of steel and concrete – malleable designs to be reworked from above by technocratic deities. The legacies of that fantasy are the planning disasters of the post-War period, costly lessons browbeaten into the minds of young urban planners today.

To use a crude analogy, if aerial photography showed us the muscular and skeletal structure of the city, the revolution in urban informatics is likely to reveal its

circulatory and nervous systems. I like to call this vision the “real-time city”, because for the first time we’ll see cities as a whole the way biologists see a cell – instantaneously and in excruciating detail, but also alive. This is in contrast to the way astronomers see a heavenly body – as it was, some time ago, light-years in the past. And as these capabilities become more widespread, the real-time city could become a place where everyone is an amateur urban planner, using urban informatics to understand the larger impacts of their everyday decisions. That, so fundamental a shift in our perception of our own civilization, seems to be something worth working towards.

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Anthony Townsend recently joined the Institute for the Future, an independent non-profit research group based in Palo Alto, California. As a Research Director, he will contribute to the Institute’s long-range technological forecasting programs. Prior to joining the Institute, Anthony enjoyed a brief but productive career in academia, where his research focused on the role of telecommunications in urban development and design. Between 2000 and 2004 he taught courses in geographic information systems, telematics, and urban design in two graduate schools at New York University: the Interactive Telecommunications Program in the Tisch School of the Arts, and the Urban Planning Program in the Wagner Graduate School of Public Service. During this period, he directed several major research projects funded by the National Science Foundation and Department of Homeland Security.

Anthony has been a key organizer in the wireless community networking movement since 2001. He is a co-founder and advisory board member of NYCwireless, a non-profit organization that promote community broadband initiatives using unlicensed wireless spectrum. From 2002 to 2004 he was a principal of Emenity, a successful startup company that built and manages public local wireless networks in public spaces in Lower Manhattan. Anthony’s work continues to develop an international focus. He has lectured and consulted throughout Asia, Europe and North America. He

lived in Korea during the summer of 2004 as a Fulbright scholar, investigating that nation's rapid development of broadband technology. Anthony holds a Ph.D. in urban and regional planning from Massachusetts Institute of Technology, a master's in urban planning from New York University, and a B.A. from Rutgers University.

More information at <http://urban.blogs.com/>

Preface

Reading Anthony's foreword tempted me to change the title of this volume from *Urban Informatics* to *Urban Anatomy* – studies of the structure of the living city. Cities are indeed living organisms. They are alive with movement. A rapid flow of exchange is facilitated by a meshwork of infrastructure connections. 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 appearances 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' 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 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 mirror 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.

Fulfilling these three challenges, urban informatics offer research methods and instruments that become the microscope of urban anatomy. Urban informatics 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 to reveal the depth and contextual nuances of urban metabolism processes at work. Although I contemplated for a minute following the fame and glory of Henry Gray's *Anatomy of the Human Body*, I decided that *Urban Informatics* would be a more fitting title. Employing Anthony's portrait of the 'real-time city' and following a suggestion by Paul Dourish, who co-authored the first chapter of this volume, the collection of chapters in this book is now – aptly, I think – titled, *Urban Informatics: The Practice and Promise of the Real-Time City*.

At this stage, the term 'informatics' requires further elaboration. Why not call this field of research and development, urban technology, urban infrastructure, or urban computing? Valid terms as they may be, I feel that they are too focused on the technology and that there is an important element missing which they do not capture adequately, and that is the human element: people, citizens, urban residents, city dwellers, urbanites. Informatics with its implied reference to information systems and information studies slightly shifts the attention away from the hardware and more towards the softer aspects of information exchange, communication and interaction, social networks, and human knowledge. Similar thinking probably guided Michael Gurstein (2000) who coined the term 'community informatics' – rather than, say, community technology – to underline the attention scholars and practitioners in this field pay to the impact of using information and communication technology on the socio-cultural and economic development of communities. Likewise, urban informatics research and development is concerned with the impact of technology, systems and infrastructure on *people* in urban environments.

The invention of the term 'urban informatics' is not mine. The earliest prominent public occurrence I could find is from September 2003. Back then, Howard Rheingold of *Smart Mob*'s fame (Rheingold, 2002) wrote an article for the now discontinued *TheFeature.com* entitled *Cities, Swarms, Cell Phones: The Birth of Urban Informatics* in which he introduced his interviewee Anthony Townsend as an "urban informatician and wireless activist". I'm honoured that Anthony, surely one of the original urban informaticians accepted my invitation to write the foreword for this book! Since 2003, Stephen Graham's (2004) *Cybercities Reader*, the late Patrick Purcell's (2006) *Networked Neighbourhoods*, as well as a number of special issues of journals (e.g., Shklovski & Chang, 2006; Kindberg, Chalmers & Paulos, 2007; Dave, 2007; Ellison, Burrows & Parker, 2007) are some of the hallmarks of urban informatics research. These works give rise to an emerging field populated by researchers and practitioners at the intersection of people, place and technology with a focus on cities, locative media and mobile technology. It is interdisciplinary in that it combines members of three broad academic communities: the social (media studies, communication studies, cultural studies, etc.), the urban (urban studies, urban planning, architecture, etc.), and the technical (computer science, software design, human-computer interaction, etc.), as well as the three linking cross sections of urban sociology, urban computing, and social computing. Furthermore, as Anthony explained in his foreword, the field's increasing transdisciplinarity is dissolving the rigid boundaries between disciplinary silos. 'Nomadic' researchers enter the stage who enjoyed more than one higher education and traverse seamlessly between

academic schools. The contributors of this book are prime examples: architects with degrees in media studies, software engineers with expertise in urban sociology, human-computer interaction designers with a grounding in cultural studies, and urban planners with an appetite for digital media and social network research.

A nucleus within this broad ecology of urban informatics is particularly worth tracing back, and that is the development of the *digital cities* notion. Toru Ishida and Peter van den Besselaar are arguably two of the most noteworthy scholars in the digital cities field of research. They initiated and supported the digital cities series of workshops that began in Kyoto, Japan, in 2000 (Ishida & Isbister, 2000) and 2002 (Tanabe, van den Besselaar & Ishida, 2002). The series then continued in conjunction with the *International Conference on Communities and Technologies (C&T)* with workshops held in Amsterdam, The Netherlands, in 2003 (van den Besselaar & Koizumi, 2005), and Milan, Italy, in 2005 (Aurigi & De Cindio, 2008). The collection of studies published in the workshop proceedings can be roughly categorised into three distinct but related understandings of the term. First, social scientists teamed up with software designers to simulate urban environments, to provide two and three dimensional visual interfaces which resemble features and qualities of a physical city. These virtual cities would offer a post office to collect your electronic mail, a shopping mall to shop online and conduct e-business transactions, a town hall to pay your parking fines, and a market square to chat and socialise. Second, the online public sphere of these digital cities captured the imagination of city officials and public servants to assist in the delivery of local government services (e-government) and in the civic engagement and participation of residents in matters of urban planning (e-participation and e-democracy). And third, digital cities also refer to the attempt to digitally augment the physical urban infrastructure with ubiquitous technology and pervasive computing. This development has now culminated in South Korea's ambitious national *u-City* strategy, which Jong-Sung Hwang of Korea's National Information Society Agency discusses in his chapter in the future section of this book.

The latest instalment of the workshop series took place on 28th June 2007 at Michigan State University in East Lansing, USA, as part of the third C&T conference. The key research questions informing the presentations and discussions at *Digital Cities 5: Urban Informatics, Locative Media and Mobile Technology in Inner-City Developments* were as follows:

- How can a balance be achieved between the opportunities of locative media and mobile technology on the one side and issues of access, trust and privacy on the other?
- What is the role of locally relevant content, such as personal and community images and narratives, in the establishment of sustainable social networks as well as in the context of civic participation?
- What can we learn from the communication models of global social networking sites such as myspace.com and facebook.com in order to animate local interaction and civic participation of residents and friends locally?
- What is the role of location, (geo)graphical representations such as maps of various kinds, in supporting people to understand and navigate the augmented urban landscape?

- What is the impact of these new technologies on the challenges in moving from e-government to e-governance, e-participation to e-democracy at the urban level? Will these technological developments help increase or decrease the opportunities for citizens to play a role in shaping sustainable cities?
- What are the implications for the architecture and urban design of cities and public spaces?

Ten chapters in this book (IV, V, VIII, X, XII, XV, XVII, XXII, XXVII, XXVIII) are based on presentations given at the *Digital Cities 5* workshop. The workshop series is interesting insofar as its conceptual development reflects a broadening of both disciplinary input and academic scope. The workshops have always been a friendly meeting place for computer engineers to exchange ideas and findings with social scientists, but other disciplinary voices from urban planning, communication studies and the arts have also been welcome to join in the discussion over the years. Furthermore, the three main streams outlined above continue to play a key role in the discussions, but they, too, are being complemented by studies examining the impact of significant new technical developments such as mobile telephony, urban screens, location-based games, as well as social developments such as participatory culture, online activism and cultural citizenship. Ensuring this research is situated in real life and real time contexts, addressing the individual needs and realising the opportunities of urban residents living in a variety of situations is pivotal – in not only keeping the research momentum alive and kicking but also in yielding maximum impact.

According to United Nations (2008) estimates, not just the majority of people in developed countries, but now the majority of the world's entire population resides in cities, and this share is growing. More than every second human being lives, works, sleeps, eats and socialises in cities. Yet, about a third of these urban residents live in slums and squatter cities (Neuwirth, 2005). The magnitude of population dynamics and pressures on existing urban environments resulting in urban sprawl, pollution, crime, and an accelerated depletion and destruction of natural resources draw stark attention to the significance of urban research. Notwithstanding these trends, rural areas grow in importance, too, since cities rely on non-urban, that is, rural and natural areas, to maintain their fast-paced metabolism which feeds on water, air and agricultural produce, and requires space for its 'excrements' such as waste and CO₂. Establishing and maintaining a balanced and sustainable ecology of urban and rural areas as well as the environment in the face of global challenges such as population growth and climate change is imperative in order to safeguard the health and well-being of humankind.

I hope that this book will stimulate your mental metabolism with a rich and multi-faceted degustation menu. Sampling the 'dishes' prepared for this urban smorgasbord will take you on a tour de force covering a great range of timely and significant topics and issues such as sustainability, digital identity, surveillance, privacy, access, environmental impact, activism, participatory planning, and community engagement. The book exposes research accounts which seek to convey an appreciation for local differences, for the empowerment of people and for the human-centred design of urban technology. Both contributors and coverage are international. They are not limited to cases based in Europe and America only. Rather, I purposefully sourced chapters covering Asia, Africa and Australia by a most engaging and prolific group of authors not afraid of presenting challenging and controversial ideas. The book starts

with some introductory examinations that situate urban informatics research in the field and critique some of the assumptions behind urban informatics, as well as propose new ways of thinking. The second section focuses on ways people use technology to participate in urban planning scenarios and online deliberations. The engagement of urban communities is the central theme of the third section of the book and brings together examples from Germany, Mexico, Australia, and Canada dealing with multiculturalism, user-led innovation, creative expression and social sustainability. The fourth section comprises examples of studies which investigate the link between the physical and digital city in the context of location, navigation and space. Wireless and mobile technology and its socio-cultural impact on urban communities and environments is the topic of the chapters in section five. And for dessert, the book concludes with a selection of outlooking and speculative chapters which examine trends in Korea and China, socio-technical innovation that support location-sensitive tools for the real-time city and citizen science, and commentaries exploring the digital desaturation of the city and – in the afterword – the relation of urban informatics to social ontology.

Guten Appetit!

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Marcus Foth is a Senior Research Fellow at the Institute for Creative Industries and Innovation, Queensland University of Technology (QUT), Brisbane, Australia. He received a BCompSc(Hon) from Furtwangen University, Germany, a BMultimedia from Griffith University, Australia and an MA and PhD in digital media and urban sociology from QUT. Marcus is the recipient of an Australian Postdoctoral Fellowship supported under the Australian Research Council's Discovery funding scheme and a 2007 Visiting Fellowship from the Oxford Internet Institute, University of Oxford, UK. Marcus' work is positioned at the intersection of people, place and technology with a focus on urban informatics, locative media and mobile applications. His research has significantly shaped the social strategies of the Kelvin Grove Urban Village, the Queensland Government's flagship urban renewal project. Employing human-centred and participatory design methods, Marcus and his team pioneer new interactive social networking systems informed by community, social and urban studies.

Since 2003, Marcus has (co-)authored over 50 publications. The high quality of his research output has attracted over \$1.16M in national competitive grants from the Australian Research Council and industry in 2006 and 2007. He is a chief investigator on the projects *New Media in the Urban Village: Mapping Communicative Ecologies & Socio-Economic Innovation in Emerging Inner-City Residential Developments*, and *Remembering the Past, Imagining the Future: Embedding Narrative and New Media in Urban Planning*. He is lead chief investigator of *Opportunities of Media and Communication Technology to Support Social Networks of Urban Residents in Mexico, South Africa, UK and Australia*, and *Swarms in Urban Villages: New Media Design to Augment Social Networks of Residents in Inner-City Developments*. He is a member of the Australian Computer Society and the Executive Committee of the Association of Internet Researchers.

More information at <http://www.urbaninformatics.net/>

Acknowledgements

This project which began in early 2007 has been a tremendous experience. Being strategically positioned as the central interface between a great number of outstanding authors and an equally great number of terrific reviewers allowed me to be exposed to the bleeding edge of urban informatics research in the making. 1548 emails later and with the publisher's imminent submission deadline in my neck, I'm feeling slightly sentimental writing these acknowledgements since it signals having to let go and hand over the final manuscript. It also means that I now have to tame my naturally impatient self in this period of anticipation of the final published book.

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Each chapter has been carefully refereed by three to four reviewers plus myself as the editor. Most of the authors of chapters included in this handbook also served as referees for chapters written by other authors. Additionally, I invited a group of external reviewers made up of highly acclaimed senior academics who provided excellent feedback and advice. Their names are listed below. I am grateful to these colleagues for their comprehensive commentary and quick turnaround of reviews. Thank you.

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Mariann Hardey, Department of Sociology, University of York, UK

Greg Hearn, Creative Industries Faculty, Queensland University of Technology, Australia

Dan Hill, Arup, Sydney, Australia

Vikki Katz, Annenberg School for Communication, University of Southern California, USA

Mark Latonero, Department of Communications, California State University, Fullerton, USA

Marcus Leaning, Trinity College, University of Wales, UK

Ian MacColl, Australasian Cooperative Research Centre for Interaction Design, Australia

Tikva Morowati, Interactive Telecommunications Program, New York University, USA

Kristina Rauschan, Institute for Media Research, Braunschweig University of Arts, Germany

Gavin Sade, Creative Industries Faculty, Queensland University of Technology, Australia

Barry Saunders, Creative Industries Faculty, Queensland University of Technology, Australia

Giandomenico Sica, Polimetrica Publishers, Italy

Matt Ward, Goldsmiths College, University of London, UK

Michele Willson, Faculty of Media, Culture and Society, Curtin University of Technology, Australia

Biographies

Barbara Adkins

Dr Barbara Adkins is Education Director at the Australasian Cooperative Research Centre for Interaction Design (ACID). Her research brings together insights from sociology, urban and design studies and sociocultural aspects of interaction design. A key focus of her sociological work has been in studies of organisations, inequality, difference and identity, and the sociology of culture, applying the work of Pierre Bourdieu. Her background is based on expertise in ethnographic case study research and qualitative approaches to data collection and analysis. She has applied these theoretical, substantive and methodological insights to the field of housing and urban development, gaining research funding from the Australian Housing and Urban Research Institute and the Office for the Status of Women on issues related to housing vulnerability. More recently she has focused on the relationship between design and disability, examining person-environment relationships experienced by people with cognitive impairment and the development of assistive technologies for this group. She is currently chief investigator on a 3 year project studying new media in a new urban village and a range of ACID projects leading ethnographic research into the social relationships involved in new applications in interaction design.

Mike Ananny

Mike Ananny is a Doctoral Candidate and Trudeau Scholar in Stanford University's Department of Communication where he researches technology-supported public communication and, specifically, relationships between journalism and new media design practices. He holds a Bachelors of Science from the University of Toronto, a Masters of Science from the MIT Media Laboratory. He was a founding member of the researcher staff at Media Lab Europe and has consulted for or worked with LEGO, Mattel and Nortel Networks, helping to translate research concepts and prototypes into new products and services.

Michael Batty

Michael Batty is Bartlett Professor of Planning at University College London where he is Director of the Centre for Advanced Spatial Analysis (CASA). From 1979 to 1990, he was Professor of City and Regional Planning in the University of Cardiff and from 1990 to 1995, Director of the National Center for Geographic Information and Analysis in SUNY-Buffalo. His most recent book is *Cities and Complexity* (MIT Press, 2005). He is Editor of *Environment and Planning B* and PI of the NCESS GeoVUE project. He is a Fellow of the British Academy and received the CBE in 2004 for 'services to geography'.

Viktor Bedö

Viktor Bedö currently holds a research scholarship by the Deutscher Akademischer Austauschdienst (German Academic Exchange Service) and is hosted by the Hermann von Helmholtz-Zentrum für Kulturtechnik in Berlin, Germany. After graduating in Philosophy at the University Vienna, Austria, he was junior researcher at the Institute for Philosophical Research of the Hungarian Academy of Sciences in

Budapest from 2003 to 2006. Since 2005 he has been a PhD student at the Doctor School for Philosophy, University of Pécs, Hungary. As a holder of the Eötvös Scholarship he was a visiting researcher at the Berlin-Brandenburg Academy of Sciences and Humanities in the summer term 2007.

Genevieve Bell

Genevieve Bell is the Director of User Experience in Intel Corporation's Digital Home Group where she manages an interdisciplinary team of social scientists and designers. A cultural anthropologist by training, her work explores the relationships between new information and communication technologies and every day social practice. Raised in Australia, Bell earned a PhD in cultural anthropology from Stanford University in 1998.

Wayne Beyea

Wayne Beyea is the Associate Director of Citizen Education and Statewide Coordinator of the Citizen planner Program at the Land policy institute at Michigan State University. Mr. Beyea has over 17 years experience in the fields of land use planning, and community and economic development. Mr. Beyea holds a B.S. in Urban Planning from Michigan State University and a Master of Public Administration from the University of Maine. He is a certified planner through the American Institute of Certified Planners and will complete a Juris Doctor degree at the Michigan State University College of Law in May, 2008.

Roger Burrows

Roger Burrows is Professor of Sociology and Co-Director of the Social Informatics Research Unit (SIRU) in the Department of Sociology at the University of York in the UK. He has published widely on a number of different topics, but most recently he has concentrated on topics related to cities, social informatics, and health and illness. Between 2005 and 2007 he was the co-ordinator of the UK Economic and Social Research Council (ESRC) e-Society Research Programme – the largest programme of social science research on digital technologies ever funded in the UK.

Francesco Calabrese

Francesco Calabrese is Postdoctoral Associate at the SENSEable City Laboratory of the Massachusetts Institute of Technology, Cambridge, MA, USA. He received the Laurea (BS and MS) degree in Computer Engineering, cum laude, in 2004, and the Ph.D. in Computer and System Engineering from the University of Naples Federico II, Italy, in 2007. During 2006 and 2007, he was also Research Assistant at the SENSEable City Laboratory of the Massachusetts Institute of Technology, Cambridge, MA, USA, with a Tronchetti Provera fellowship, major recognition awarded by the Italy-MIT Consortium. His research interests include hybrids control systems, embedded control systems, CNC machines, real-time analysis of telecom systems and urban dynamics. Francesco Calabrese is a member of the IEEE and the Control Systems Society.

John M. Carroll

John M. Carroll is Edward M. Frymoyer Chair Professor of Information Sciences and Technology at Pennsylvania State University. His research interests include methods and theory in human-computer interaction, particularly as applied to networking tools for collaborative learning and problem solving, and design of interactive information systems. He has worked in community informatics for the past 15 years. Recent books include *Making Use* (MIT Press, 2000), *HCI in the New Millennium* (Addison-Wesley, 2001), *Usability Engineering* (Morgan-Kaufmann, 2002) and *HCI Models, Theories, and Frameworks* (Morgan-Kaufmann, 2003). He serves on several editorial and advisory boards and is Editor-in-Chief of the *ACM Transactions on Computer-Human Interactions*. He received the Rigo Award and CHI Lifetime Achievement Award from the Association for Computing Machinery (ACM), the Silver Core Award from International Federation of Information Processing (IFIP), and the Alfred N. Goldsmith Award from the Institute of Electrical and Electronics Engineers (IEEE). He is a fellow of the ACM, the IEEE, and the Human Factors and Ergonomics Society.

Luis A. Castro

Luis A. Castro is a doctoral student (PhD) at the Manchester Business School of the University of Manchester. His research interests include ubiquitous computing, location aware computing, neural networks and HCI. Castro received a Bachelor's in Information Technology from the Institute of Technology in Mexicali, Mexico and a Master's in Computer Science from CICESE, Mexico. Castro participated in a project called "The Family Newspaper" aimed to support the relationship maintenance for older Mexican people and their family living abroad using a web-based communication technology. Luis Castro has also participated in international competitions for technology design sponsored by ACM SIGCHI. He is a student member of the ACM.

Jaz Hee-jeong Choi

Jaz Hee-jeong Choi is a doctoral candidate in the Creative Industries Faculty at Queensland University of Technology. Her research interests are in playful technology, particularly the ways in which various forms of playful interaction are designed, developed, and integrated in an Asian context. Her current research is on the *trans-youth* mobile play culture of South Korea at the intersection of play, culture, technology, people, and urban environment. Her website is located at www.nicemustard.com

Fiorella De Cindio

Fiorella De Cindio is Associate Professor at the Computer and Information Science Department of the University of Milano, where she teaches courses on Programming Languages, Distributed Systems Design and Virtual Communities. Her research interests includes Petri nets as concurrency theory, programming languages and the applications of the ICTs to support life and work within social and office systems. In

1994, she promoted the Civic Informatics Laboratory (LIC) and set up the Milano Community Network (RCM). She also promoted the Association for Informatics and Civic Networking of Lombardy (A.I.Re.C.) which groups the Community Networks in the Lombardy Region. Fiorella De Cindio is now President of both.

Barbara Crow

Barbara Crow is an associate professor and the Graduate Program Director in Communication and Culture at York University in Toronto. Her research interests include digital technologies, feminist theory, social movements, and the political economy of communication.

Joel Dearden

Joel Dearden is a Research Assistant in the Centre for Advanced Spatial Analysis (CASA) at University College London. He was previously systems administrator in CASA and is now working on the porting for 3D and multimedia into Second Life, a project focussed on the development of geographic media in virtual worlds. He has worked on the development of graphics games and was trained in computer science at Imperial College London.

Jean-François Doulet

Associate Professor, Jean-François Doulet has been exploring urban change in China for many years. He is more specifically interested in understanding how increasing mobility is transforming daily life in cities and the production of urban space. His bibliography is largely dedicated to automobile use and innovative mobility solutions in China and abroad. He co-authored (with historian Mathieu Flonneau) *Paris-Pékin, civiliser l'automobile* (2003), a comparative study on the impact of automobile use on urban mobility schemes in Paris and Beijing. In addition, he heads the China Programme of the Paris-based think tank City on the Move Institute (www.city-on-the-move.com). Since 2006, he has been working, as a scientific advisor, in shaping research activities on ICT usage in Chinese cities within Orange Labs Beijing (France Telecom Group). <http://www.villeschinoises.com>

Ines Di Loreto

Ines Di Loreto, degree in philosophy at the University of Milan, is now a PhD student in Computer Science at the University of Milan. Her research interests include *Social Media* and their societal impact. In particular, she investigates the relationship between ICTs and representation of the self, analyzing how representations – and the resulting relationships build through them – are constructed in the age of Web 2.0.

Paul Dourish

Paul Dourish is Professor of Informatics at University of California, Irvine, with courtesy appointments in Computer Science and in Anthropology. His research interests lie at the intersection of computer science and social science, with particular emphasis on human-computer interaction and ubiquitous computing. His empirical

and conceptual investigations focus on information and communication technologies as sites of social and cultural production.

Laura Forlano

Laura Forlano is a Visiting Fellow at the Information Society Project at Yale Law School and a Ph.D. Candidate in Communications at Columbia University. Her research interests include organizations, technology (in particular, mobile and wireless technology) and the role of place in communication, collaboration and innovation. Forlano is an Adjunct Faculty member in the Design and Management department at Parsons and the Graduate Programs in International Affairs and Media Studies at The New School. She serves as a board member of NYCwireless and the New York City Computer Human Interaction Association. Forlano received a Masters in International Affairs from Columbia University, a Diploma in International Relations from The Johns Hopkins University and a Bachelor in Asian Studies from Skidmore College.

Marcus Foth

Marcus Foth is a Senior Research Fellow at the Institute for Creative Industries and Innovation, Queensland University of Technology (QUT), Brisbane, Australia. He received a BCompSc(Hon) from Furtwangen University, Germany, a BMultimedia from Griffith University, Australia and an MA and PhD in digital media and urban sociology from QUT. Marcus is the recipient of an Australian Postdoctoral Fellowship supported under the Australian Research Council's Discovery funding scheme and a 2007 Visiting Fellowship from the Oxford Internet Institute, University of Oxford, UK. Marcus' work is positioned at the intersection of people, place and technology with a focus on urban informatics, locative media and mobile applications. His research has significantly shaped the social strategies of the Kelvin Grove Urban Village, the Queensland Government's flagship urban renewal project. Employing human-centred and participatory design methods, Marcus and his team pioneer new interactive social networking systems informed by community, social and urban studies.

Since 2003, Marcus has (co-)authored over 50 publications. The high quality of his research output has attracted over \$1.16M in national competitive grants from the Australian Research Council and industry in 2006 and 2007. He is a chief investigator on the projects *New Media in the Urban Village: Mapping Communicative Ecologies & Socio-Economic Innovation in Emerging Inner-City Residential Developments*, and *Remembering the Past, Imagining the Future: Embedding Narrative and New Media in Urban Planning*. He is lead chief investigator of *Opportunities of Media and Communication Technology to Support Social Networks of Urban Residents in Mexico, South Africa, UK and Australia*, and *Swarms in Urban Villages: New Media Design to Augment Social Networks of Residents in Inner-City Developments*. He is a member of the Australian Computer Society and the Executive Committee of the Association of Internet Researchers.

More information at <http://www.urbaninformatics.net/>

Craig H. Ganoe

Craig H. Ganoe is an Instructor in Information Sciences and Technology at Pennsylvania State University. His research interests include multiple-device interactions, computer supported cooperative work and learning, collaboration in community network contexts, and ubiquitous computing. He leads the BRIDGE Tools open source project (bridgetools.sourceforge.net). He is a member of the Association for Computing Machinery (ACM) and currently serves as Information Director for the *ACM Transactions on Computer-Human Interactions*.

Jens Geelhaar

Prof. Dr. Jens Geelhaar is Dean of the Media Faculty at the Bauhaus University of Weimar, Germany. He is Professor of Interface Design and specialises in art and design aspects of interaction in ubiquitous computing environments with multimodal interfaces. He studied at the Universities of Karlsruhe and Heidelberg and at the Art School in Saarbrücken, Germany.

Christine Geith

Dr Christine Geith is an assistant provost and executive director of Michigan State University's MSUglobal, the university's entrepreneurial business unit that works with academic partners across the campus and worldwide to develop online institutes, programs and services. Dr. Geith's publications and research include costs, benchmarks and business models for online and blended learning. Dr. Geith's 20-years of experience in educational technology and online learning includes executive director of e-learning and co-director of the Educational Technology Center at Rochester Institute of Technology. Dr. Geith holds an M.B.A. from Rochester Institute of Technology and a Ph.D. from the University of Nebraska-Lincoln.

Victor M. Gonzalez

Victor M. Gonzalez is a Lecturer (Assistant Professor) in Human-Computer Interaction at the Manchester Business School of the University of Manchester. He is also a Senior Research Fellow of CRITO (Centre for Research on Information Technology and Organizations) at the University of California at Irvine, USA. He conducts investigations on technology usage in the home, office and hospital settings and specializes in the use of ethnographic methods (e.g. interviews, participant observation) and participatory design techniques (e.g. scenario-based design). He received a Ph.D. and Master's degree in Information and Computer Science from the University of California at Irvine and a Master's degree in Telecommunications and Information Systems from the University of Essex, United Kingdom. He is a member of ACM SIGCHI and vice-president of SIG-CHI Mexican Chapter.

Adam Greenfield

Adam Greenfield is an instructor at New York University's Interactive Telecommunication Program, where he teaches Urban Computing. He is author of the

2006 *Everyware: The dawning age of ubiquitous computing* and co-author, with Mark Shepard, of the recent *Urban Computing and Its Discontents*. He lives and works in New York City with his wife, artist Nurri Kim.

Greg Hearn

Professor Greg Hearn is Research Professor in the Creative Industries Faculty at QUT. His work focuses on policy development and research and development for new technologies and services in the creative industries. In 2005 he was an invited member of a working party examining the role of creativity in the innovation economy for the Australian Prime Minister's Science Engineering and Innovation Council. He has authored or co-authored over 20 major research reports and a number of books, including, *Public policy in knowledge-based economies* (2003: Edward Elgar), and *The knowledge economy handbook* (2005: Edward Elgar).

Sonya Huang

Sonya Huang is a PhD candidate in urban information systems at the Massachusetts Institute of Technology. Her research interests include the impacts of information and communication technologies on economic geography and the nature of firms and labor, policy implications of georeferenced data, and methods for presenting geospatial data using open-source tools. She received an SB in economics from MIT and joined the SENSEable City Laboratory in 2005.

Andy Hudson-Smith

Andy Hudson-Smith is Senior Research Fellow in CASA in University College London where he leads both the NCeSS GeoVUE and Virtual London projects. His focus is on Web 2.0 technologies in geography and urban planning which he has researched since his PhD. His blog <http://www.digitalurban.blogspot.com> features daily news and research on the world of urban visualisation. He is the author of *Digital Geography: Geographic Visualisation of Urban Environment* (CASA, UCL, 2008).

R. J. Honicky

R. J. Honicky is a Ph.D. student in the Computer Science department at UC Berkeley, and a member of the Technology and Infrastructure for Emerging Regions (TIER) research group. His dissertation work focuses on building a distributed scientific instrument by integrating environmental sensors into cell phones. He also studies various low cost wireless and networking technologies. He has worked at Intel Research, Tensilica, Microsoft Research, Network Appliance, Airtouch Cellular (now AT&T) and various startups. He has a Master of Science degree in Computer Science from UC Santa Cruz, and BA in English Literature from the University of Michigan.

Ben Hooker

Ben Hooker is a multimedia designer whose work explores new experiences and aesthetic situations which arise from the intermingling of the phenomenal and

intangible worlds of physical materiality and electronic data. His background is computer-based multimedia design. He graduated from the Royal College of Art's Computer Related Design program in 1997, and after this worked for several years as freelance designer for clients such as the BBC, Sony and Philips, while also continuing at the College as a researcher in the Interaction Design Research Studio. Today Ben divides his time between creative practice, consultancy and teaching. He currently holds a Visiting Faculty position at Intel's Research Lab in Berkeley, California. Alongside this he continues to work with long-time collaborator Shona Kitchen. Recent projects they have completed include a multi-site electronic installation for San José International Airport and a conceptual housing project for the Vitra Design Museum.

Jong-Sung Hwang

Dr Jong-Sung Hwang is the Executive Vice President of the National Information Society Agency (NIA), heading the IT Policy Division. Since he joined NIA in 1995, he has developed Korea's national IT strategies, including the Informatization Promotion Basic Plan in 1996, the Cyber Korea 21 in 1999, and the u-Korea Master Plan in 2006. Since 2005, he has been in charge of promoting ubiquitous computing services, including RFID, USN and u-City. Dr Hwang received his Ph. D. in political science from Yonsei University, Korea in 1994. He is serving as an adjunct professor of the Graduate School of Information, Yonsei University.

Toru Ishida

Toru Ishida (Doctor of Engineering, Kyoto University) is a professor in the Department of Social Informatics, Kyoto University. Until 1993, he was a research scientist at the NTT Laboratories. He spent some time at Columbia University, Technische Universität München, Université Pierre et Marie Curie, University of Maryland, Shanghai Jiao Tong University, and Tsinghua University as a visiting scholar/professor. He is an IEEE fellow from 2002. He has been working on autonomous agents and multiagent systems for twenty years. He also studies social informatics and leads research projects such as digital cities, language grid and intercultural collaboration.

Katrina Jungnickel

Katrina Jungnickel recently completed her PhD at INCITE (Incubator for Critical Inquiry into Technology and Ethnography) at the Goldsmiths College, University of London. Her doctoral work on volunteer community wireless groups in Australia (<http://www.studioincite.com/makingwifi>) presents a methodological and theoretical intervention into DIY practice, visual methodology and the sociological accounts of information and communication technologies.

Helen Klæbe

Dr Helen Klæbe is a senior research fellow at QUT. Her PhD examined new approaches to participatory public history using multi art form storytelling strategies. She is the author of: *Onward Bound: the first 50 years of Outward Bound Australia*

(2005); and *Sharing Stories: a social history of Kelvin Grove* (2006). Kloebe also consults as a public historian, particularly focusing on engaging communities of urban renewal projects, and regularly designs and manages co-creative media workshops for a range of commercial and public sector organisations.

Kristian Kloeckl

After having attended Architecture and Industrial Design degree courses in Austria, England and Italy, Kristian Kloeckl graduated at the Politecnico di Milano, Italy, with distinction. He is currently enrolled in the Design Science PhD program at the Luav University of Venice, Italy, and a Visiting Ph.D. student at the SENSEable City Laboratory of the Massachusetts Institute of Technology, Cambridge, MA, USA. His research interests have covered areas such as product design in the urban context, medical design and connections design while he is also holding design classes in various institutes. Besides his academic work he has been collaborating with leading design studios in Berlin and Milan before setting up his own design practice in 2003 in Venice.

Satoshi Koizumi

Satoshi Koizumi is an associate professor at Osaka University. His research interests include computer vision and virtual reality. He received a B.Eng. and M.Eng. in mechanical engineering from Aoyama Gakuin University, and a D.Eng. in computational intelligence and systems science from the Tokyo Institute of Technology.

Vassilis Kostakos

Vassilis Kostakos is an Assistant Professor at the Department of Mathematics & Engineering, University of Madeira, and an Adjunct Assistant professor at the HCI Institute, Carnegie Mellon University. He previously was appointed Research Associate at the Department of Computer Science, University of Bath. His research interests include mobile and pervasive computing, complex and social networks, security and privacy. Kostakos received a PhD in Computer Science from the University of Bath.

Kenneth L. Kraemer

Kenneth L. Kraemer is Research Professor of Information Systems and Co-Director of the Center for Research on Information Technology and Organizations (CRITO), at the Paul Merage School of Business, University of California, Irvine. His research interests include the social implications of IT, national policies for IT production and use (*Asia's Computer Challenge*, Oxford 1998), and the contributions of IT to productivity and economic development. His recent book is *Globalization of E-Commerce* (Cambridge University Press, 2006). He is engaged new work on the offshoring of knowledge work and who captures the value from innovation radical and incremental innovations.

Michael Longford

Michael Longford recently joined the Department of Design at York University in Toronto. His creative work and research activities reside at the intersection of photography, graphic design and digital media. He recently completed a three-year project as the co-principal investigator for the Mobile Digital Commons Network (MDCN), a national research network developing technology and media rich content for mobile devices. He is a founding member of Hexagram: Institute for Research and Creation in Media Arts and Technologies in Montreal, and served for three years as the Director for the Advanced Digital Imaging and 3D Rapid Prototyping Group.

Charles McKeown

Charles McKeown facilitates the establishment of a permanent campus-based land use modeling and outreach initiative at the MSU Land Policy Institute. Along with a multi-disciplinary team he helps develop predictive tools for land use planning and education. Chuck holds two degrees from Michigan State University, a Bachelor of Science degree in Entomology, and a Master of Science degree in Entomology, specializing in Ecology. He is also a veteran of the U.S. Marine Corps.

Richard Milton

Richard Milton is a Research Fellow in the Centre for Advanced Spatial Analysis (CASA) at University College London where he works on the NCeSS GeoVUE project. He previously worked on the Equator project where he used GPS tracked sensors to make fine-scale maps of carbon monoxide around the local area. While at CASA he has released the 'GMapCreator' software for creating thematic *Google Maps*, the 'Image Cutter' for publishing large photos on the web and the 'PhotoOverlayCreator' for turning panoramic images into photo overlays for *Google Earth*. He was trained in Information Systems Engineering at Imperial College London.

Colleen Morgan

Colleen Morgan is a research associate at the Australasian CRC for Interaction Design in Brisbane, Australia. Colleen received her Bachelor of Creative Industries and First Class Communication Design Honours Degree from Queensland University of Technology. Conducting practiced-based research, Colleen designs and implements ICT urban interventions, exploring how they can foster community sentiment and social capital.

Hideyuki Nakanishi

Hideyuki Nakanishi is an associate professor in the Department of Adaptive Machine Systems, Osaka University. He received a B.Eng. and M.Eng. in computer science, and a Ph.D. in informatics from Kyoto University in 1996, 1998 and 2001 respectively. He was an assistant professor in the Department of Social Informatics, Kyoto University from 2001 to 2005. At the time he developed a social interaction platform called FreeWalk in the Digital City Project. He has been working on virtual

social interaction including virtual casual meetings, agent-mediated communities, and transcendent communication.

Eric Paulos

Eric Paulos is a Senior Research Scientist at Intel in Berkeley, California where he is the founder and director of the Urban Atmospheres research group - challenged to employ innovative methods to explore urban life and the future fabric of emerging technologies across public urban landscapes. His areas of expertise span a deep body of research territory in urban computing, sustainability, green design, environmental awareness, social telepresence, robotics, physical computing, interaction design, persuasive technologies, and intimate media. Eric is a leading figure in the field of urban computing and is a regular contributor, editorial board member, and reviewer for numerous professional journals and conferences. He received his PhD in Electrical Engineering and Computer Science from UC Berkeley where he helped launch a new robotic industry by developing some of the first internet tele-operated robots including Space Browsing helium filled blimps and Personal Roving Presence devices (PRoPs).

Cristian Peraboni

Cristian Peraboni is a Ph.D. student in Computer Science at the University of Milan. He took his degree in Computer Science at the Department of Informatics and Communications of the University of Milan in April 2005 with the thesis "An ontology of Computer Science to retrieve learning objects". Now he is involved in the e21 project that is aimed at overcome the hindrances to participation typical of local Agenda 21 processes by creating a social environment on a custom-designed, dedicated online-deliberation platform. His research interests include virtual communities, e-Participation, e-Deliberation, Web 2.0, online social networks, folksonomies and Knowledge Management.

Debra Polson

Debra Polson is an academic and independent designer, focused on exploiting unique aspects of digital games and creative social networks. Debra holds an academic position at Queensland University of Technology, Communication Design Department and has recently been seconded to the Australasian CRC for Interaction Design (ACID) as Senior Research Fellow. In this position Debra has led a number of multi-discipline research and development projects, such as CIPHER CITIES, MILK and SCAPE that endeavour to exploit the potentials of computer games and mobile technologies to improve human relationships in environments such as schools, museums and everyday public places.

Nancy Odendaal

Nancy Odendaal is currently a senior lecturer in Urban and Regional Development Planning at the School of Architecture, Planning and Housing at the University of KwaZulu-Natal in Durban, South Africa. She is also a PhD Candidate in the School of Architecture and Planning at Wits University in Johannesburg. Before joining the

University full-time in 2001, she worked on the EU-funded Cato Manor Development project in Durban for five years as a planner and manager of the Cato Manor Development Association's Geographic Information System. Prior work experience includes involvement in a number of planning and development projects in Namibia and Swaziland, working in the public and private sectors. In addition to her academic work, she has consulted on a range of projects for municipalities and various national government departments in South Africa.

Eamonn O'Neill

Eamonn O'Neill is a senior lecturer and director of postgraduate research studies in the Department of Computer Science at the University of Bath. His research interests include mobile and pervasive computing, participatory design, and technological support for creativity. O'Neill received a PhD in Computer Science from the University of London.

Jenny Preece

Jenny Preece is Professor and Dean of the College of Information Studies – Maryland's iSchool - at the University of Maryland. Jenny's teaching and research focuses on the intersection between information, community and technology. She is particularly interested in community participation on- and off-line and social computing. She has researched ways to support empathy online, patterns of online participation and what makes technology-supported communities successful. Jenny is author of over two hundred articles that include refereed journal and conference proceedings and eight books. Her two most recent books are: "Online Communities: Designing Usability, Supporting Sociability" (2000) and a co-authored text entitled "Interaction Design: Beyond Human-Computer Interaction" (1st Ed. 2002; 2nd Ed. 2007). Both books are published by John Wiley & Sons. She is also a regular conference keynote speaker.

Carlo Ratti

An architect and engineer by education, Carlo Ratti is Associate Professor of the Practice of Urban Technologies at the Massachusetts Institute of Technology. There, he directs the SENSEable City Laboratory, a new research initiative that explores how technology is transforming urban design and living. Carlo is also founding partner and director of carlorattiassociati, a rapidly growing architectural practice that was established in Turin, Italy, in 2002. Carlo graduated in structural engineering from the Politecnico di Torino and the Ecole Nationale des Ponts et Chaussées, later specializing in architecture with MPhil and PhD degrees from the University of Cambridge. He is a member of several professional organizations, including the Ordine degli Ingegneri di Torino, the Association des Anciens Elèves de l'Ecole Nationale des Ponts et Chaussees and the UK Architects Registration Board.

Erica Robles

Erica Robles is a Ph.D. Candidate in the Department of Communication at Stanford University. Her research focuses on intersections between media technologies and the built environment. Posing research questions through diverse methodologies, from

controlled laboratory experiments to archival work, interviews, and ethnographic observation she articulates both psychological and cultural components at play within contemporary mediaspaces. She is currently completing a dissertation about the Crystal Cathedral, a pioneering and influential megachurch and media ministry renown for its use of technologies and transparent architectures in the worship space.

Christine Satchell

Dr Christine Satchell is a Senior Research Fellow at Queensland University of Technology. She is the recipient of an Australian Postdoctoral Fellowship (Industry) supported under the Australian Research Council's Linkage funding scheme (LP0776341). Her project *Swarms in Urban Villages: New Media Design to Augment Social Networks of Residents in Inner-City Developments* informs the design of web and mobile technology to support social networks of urban residents. She is also an Honorary Research Fellow with the Interaction Design Group at The University of Melbourne. Her research is concerned with understanding the social and cultural nuances of everyday user behaviour in order to inform design. Integral to this is the development of a methodological approach that embeds cultural theory within Human Computer Interaction. A specific focus of her research is the design of mobile artefacts. She is also the developer of the Swarm, a patented mobile phone prototype that allows the user to simultaneously represent multiple digital identities and embed their virtual presence with digital content.

Kim Sawchuk

Kim Sawchuk is an associate professor in the Department of Communication Studies at Concordia University in Montreal, where she teaches courses in research methodologies, communications theory, and feminist media studies. She is a founding editor of *wi: a journal of mobile digital commons network* and is the current editor of the *Canadian Journal of Communication*.

Andres Sevtsuk

Andres Sevtsuk is a PhD candidate in city design and development and urban information systems at the Massachusetts Institute of Technology. His research interests include accuracy and reliability in using mobile phone data for estimating the distribution of people in cities, the relationship between urban form and movement, and the study of new possibilities in street parking and one-way vehicle rentals using distributed computation and sensing. He received his MS in architecture studies from MIT.

Kai Schubert

Kai Schubert studied Modern and Recent History and Print Media Technology at Chemnitz University of Technology in Germany. He wrote his master thesis in Krakow (Poland) to the history of the "Institut für deutsche Ostarbeit" in the Second World War. Currently he is research associate at the University of Siegen.

Dan Shang

Dan Shang is Sociology Researcher and Service Development Manager at Orange Lab Beijing (France Telecom Group); her research focus is on urban mobility and online communities. She is especially interested in how mobile and urban technologies affect the way people use space and reinvent relations between mobility and sociability.

Mark Shepard

Mark Shepard is an Assistant Professor at the University at Buffalo, State University of New York, where he holds a joint appointment in the Departments of Architecture and Media Study and co-directs the Center for Virtual Architecture. His research focuses on the implications of mobile and pervasive computing for medial, architectural and urban space. He is co-editor of the Situated Technologies Pamphlet Series, published by the Architectural League of New York. His recent project, the Tactical Sound Garden, has been presented at museums, galleries, conferences and festivals internationally. He holds a MS in Advanced Architectural Design from Columbia University; a MFA in Combined Media from Hunter College, City University of New York; and a B.Arch from Cornell University.

Carol Strohecker

Carol Strohecker is Director of the Center for Design Innovation, an interinstitutional research center of the University of North Carolina and founder of Strohecker Associates, generators of tools, programs and environments for learning. She was Principal Investigator of the Everyday Learning research group at Media Lab Europe, the European research partner of the MIT Media Lab and worked at Mitsubishi Electric Research Laboratories and in the Human Interface Group of Sun Microsystems. She earned the PhD of Media Arts and Sciences from the Massachusetts Institute of Technology in 1991 and the Master of Science in Visual Studies from MIT in 1986. She has served MIT's Program in Media Arts and Sciences as a Lecturer and as a Presidential Nominee on the MIT Corporation Visiting Committee.

Daisuke Tamada

Daisuke Tamada is a masters student in Department of Adaptive Machine Systems, Osaka University. He is currently working on social interaction for collaborative geographical content generation. He received a B.Eng. in mechanical engineering from Osaka University.

Tristan Thielmann

Tristan Thielmann is an Assistant Professor of Media Geography at the University of Siegen, Germany. He studied Media Management at the University of Siegen, Audiovisual Media Science at the University for Film and Television "Konrad Wolf" in Babelsberg, European Media and Cultural Studies at the University of Bradford and Experimental Media Design at the University of Arts Berlin. He received his

Ph.D. in Communication Studies at the Ludwig Maximilians University Munich. Since 2005 he is Senior Research Fellow at the Collaborative Research Center FK 615 “Media Upheavals”, University of Siegen, Germany. Recent publications: *Display I: analog* and *Display II: digital* (edited together with Jens Schröter), Marburg: Schüren 2006 and 2007; *Spatial Turn* (edited together with Jörg Döring), Bielefeld: Transcript 2008. See also <http://www.spatialturn.de>

Anthony Townsend

Anthony Townsend recently joined the Institute for the Future, an independent non-profit research group based in Palo Alto, California. As a Research Director, he will contribute to the Institute’s long-range technological forecasting programs. Prior to joining the Institute, Anthony enjoyed a brief but productive career in academia, where his research focused on the role of telecommunications in urban development and design. Between 2000 and 2004 he taught courses in geographic information systems, telematics, and urban design in two graduate schools at New York University: the Interactive Telecommunications Program in the Tisch School of the Arts, and the Urban Planning Program in the Wagner Graduate School of Public Service. During this period, he directed several major research projects funded by the National Science Foundation and Department of Homeland Security.

Anthony has been a key organizer in the wireless community networking movement since 2001. He is a co-founder and advisory board member of NYCwireless, a non-profit organization that promote community broadband initiatives using unlicensed wireless spectrum. From 2002 to 2004 he was a principal of Emenity, a successful startup company that built and manages public local wireless networks in public spaces in Lower Manhattan. Anthony’s work continues to develop an international focus. He has lectured and consulted throughout Asia, Europe and North America. He lived in Korea during the summer of 2004 as a Fulbright scholar, investigating that nation’s rapid development of broadband technology. Anthony holds a Ph.D. in urban and regional planning from Massachusetts Institute of Technology, a master’s in urban planning from New York University, and a B.A. from Rutgers University.

More information at <http://urban.blogs.com/>

Michael Veith

Michael Veith studied english linguistics, psychologies and informatics (Magister) at the University of Siegen. His master thesis dealt especially with the question of how ethnic minorities in Germany may be better integrated into society by the help of computer supported cooperative project work. These projects at an elementary school are furthermore realized by mixing generations (parents with children) as well as socio-cultural backgrounds.

Amanda Williams

Amanda Williams is a Ph.D. Candidate at UC Irvine's Donald Bren School of Information and Computer Sciences and a member of the Laboratory for Ubiquitous Computing and Interaction. Her research interests include urban computing, mobility, and tangible interfaces. She is currently doing ethnographic field work and system design in Bangkok, focusing on urban mobilities and mobile technology.

Katharine S. Willis

Katharine S. Willis is Marie Curie Research Fellow at the Bauhaus University of Weimar, Germany. Her work explores the ways in which we interact with our spatial surroundings, and in particular approaches to understanding how we can create legible environments. These projects investigate wayfinding, identity and the transformative possibilities of mobile and wireless technologies.

Volker Wulf

Volker Wulf is a professor in Information Systems and the director of the Media Research Institute at the University of Siegen. At Fraunhofer FIT, he heads the research group User-centred Software-Engineering (USE). His research interests lie primarily in the area of Computer Supported Cooperative Work, Knowledge Management, Human Computer Interaction, and Participatory Design.

Andrea Zeffiro

Andrea Zeffiro is a doctoral candidate in Communication at Concordia University, Canada. She has worked as a researcher with the Mobile Digital Commons Network and as managing editor of the on-line journal, *Wi* (www.wi-not.ca). She is Senior Editorial Assistant for the *Canadian Journal of Communication*, (www.cjc-online.ca).