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 liveable 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 provides 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, who enjoyed more than one higher education and traverse seamlessly between academic schools, enter the stage. The contributors to this book are prime examples: architects with degrees in media studies, software engineers with expertise in urban sociology, human-computer interaction designers grounded 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
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 and provided two and three dimensional visual interfaces resembling 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 and 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 as well as 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 CO$_2$. 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 Grand Tour 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 investigating 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 speculative chapters, which examine trends in Korea and China, socio-technical innovation that supports 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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April 2008
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