

## Urban Design and Pervasive Systems

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### Abstract

Building pervasive information and communication systems as an embedded part in the everyday physical world requires a new way of thinking about the design and use of these systems and how they interweave with the built environment, allowing information and communication devices to sense changes in their environment and to automatically react and adapt based on user needs and preferences in relation to these changes.

Architecture and urban design have not featured strongly in pervasive systems research. Currently there are no fundamental theories, methods or tools for designing pervasive systems as integral elements of the urban landscape. Here we present an early approach for developing a theoretical frame work and understanding for designing pervasive computing technologies as integral elements of the urban landscape in the city of Bath as part of the CityWare project. We suggest that the application of innovative research methods based on Space Syntax theory and analysis tools may help throw further light on understanding the complex relationship between pervasive systems, urban space and society in general; and on the impact of the deployment of a pervasive system on people's relationships to heritage, and the social space in particular.

The application of space syntax theory and methodology to the development, use and evaluation of public pervasive systems will be investigated as an attempt to address the challenges of the implementation, deployment, use and evaluation of pervasive systems from the currently prevailing small scale examples to long-term, city-scale pervasive systems. Furthermore various emerging issues will be explored. These include: 1) Understanding the complex relationship between pervasive computing technologies, urban space and society, 2) Understanding the nature of the city and its relationship with society, 3) Understanding the role of heritage in the construction of society and social structures, 4) Understanding the impact of the deployment of pervasive systems on our understanding of the city, the heritage and on our sense of belonging to the physical and social space. The research methods associated with these issues involve both analytic and intervention methods. These will combine analyses of people's movements and activities in the existing urban environment of Bath together with the analyses of the pervasive technologies and the interaction spaces they create. We believe that the results of these analyses will contribute to fundamental theory and knowledge and will be embodied in novel design principles and techniques.

In the next sections we describe the research objectives, we then review research methods before finally drawing conclusions related to the nature of the proposed research.