



The 1st Equator IRC Workshop on Ubiquitous Computing in Domestic Environments

Workshop Abstracts

Alan Dowdall and Mark Perry **Work Group WG1**
Department of Information Systems and Computing, [Brunel University](#)

The Millennium Home: Domestic Technology to Support Independent-living Older People

Abstract. The number of older people in the population is increasing, and the problem of supporting a good quality of life for an ageing population is greatest in developed countries such as the USA, Japan and Britain because of the demographic structures of these countries. In Britain, improvements in quality of life and lower birth rates have resulted in those over 65 years of age representing 16% of the population, with this figure expected to rise to 19% in the first quarter of the 21st century. Many of these older adults, for reasons of personal choice and economics, will continue to live independently with a large number of them living alone. However, the elderly are far more prone to accidents in the home and often lie injured and undiscovered should one happen. It is in the interest of society in general that some way be found to detect early manifestations of problems they may have and provide some kind of a response to resolve the problem or summon external aid as quickly as possible. This also needs to be done in a way that the resident is comfortable using, is useful to them, and is usable. This paper provides details on the work to date of the Millennium Home project, which uses a combination of unobtrusive sensors, linked to a computer to monitor the well being of the elderly resident. Should a situation arise where the residents well-being may be threatened, the system will communicate with them in an attempt to resolve the situation or contact an outside party for assistance.

Lynne Baillie and David Benyon **Work Group WG1**
School of Computing, [Napier University](#)

Investigating Ubiquitous Computing in the Home

Abstract. In this paper, we describe a series of workshops which were carried out in homes of five families in Scotland. The aim of the workshops was to explore the requirements that people have for new technologies in a household environment. The workshops were video-taped, transcribed and analysed from a number of perspectives. In this paper we concentrate on an analysis of the transcripts from the perspective of ubiquitous computing. The designs of possible future technologies will also be examined. Conclusions as to the applicability of the methods used here for future ubiquitous computing research and research in households are presented.

Mark Rouncefield, Keith Cheverst, **Work Group WG1**

1st Equator IRC Workshop on Ubiquitous Computing, 13-14 Sept 2001, Nottingham UK

Adrian Friday, Stewart Kember, Kieth Mitchell and Peter Phillips
Computing Department, Lancaster University

Design and Digital Care

Abstract. This paper is primarily about design and some of the difficulties of “appropriate” design in care settings. This is hardly a novel concern but this particular focus arises as a consequence of digital technologies maturing and transferring to the everyday domain. Domestic environments are becoming key sites for the consumption of information and communication technologies, embracing in the “care” domain various forms of “assistive” technologies and the design and provision of “smart” homes. This paper reports on the Equator IRC “Care in the Digital Community” project – a multidisciplinary research programme concerned with the development of enabling technologies to assist care in the community for particular user groups with different support needs. The general aim is to examine how digital technology can be used to support sheltered housing residents and their staff.

Rob Hague, Alan F. Blackwell, and Peter Robinson **Work Group WG2**

University of Cambridge Computer Laboratory

End-User Programming in the Networked Home

Abstract. Pervasive networking of domestic appliances provides a wealth of possibilities. Some of these possibilities will be anticipated by developers, but many will be novel and unexpected. Hence, the provision of end-user programming adds significant utility to a networked home. The work described investigates the design of end-user programming systems for a diverse user population, in the context of the Cambridge AutoHAN project.

Bo Westerlund, Sinna Lindquist, and Yngve Sundblad **Work Group WG2**

Centre for User-Oriented IT Design, The Royal Institute of Technology

Cooperative Design of Communication Support for and With Families

Abstract. In this paper we describe how the work in the InterLiving project (“Designing Interactive, Intergenerational Interfaces for Living Together”) has started with families as design partners and we report some early experience. The project has its point of departure in “the user end” by letting the families themselves describe how communication comes into their living together by drawing communication maps and using communication probes.

Peter Tolmie, James Pycocock, Tim Diggins, Allan Maclean and Alain Karsenty
Xerox Research Centre Europe **Work Group WG2**

Unremarkable Computing: Routines and the Design of ‘Invisible in Use’

Abstract. In this paper, we aim to move the Ubiquitous Computing agenda forward by focusing on one of its earliest, but most difficult, ambitions - making technology “invisible in use”. We draw on field studies of domestic life as this domain is becoming increasingly important for new technologies and challenges many of the assumptions we take for granted in the design of technologies for the workplace. In particular, we analyse some examples of domestic routines and identify a number of insights into what it means for the features of activities to be “unremarkable”. We conclude by using these insights to critique some of the current emphases in ubiquitous computing research, and suggest

1st Equator IRC Workshop on Ubiquitous Computing, 13-14 Sept 2001, Nottingham UK

how we might better understand what will be required to develop technologies that really are “invisible in use”.

Vic Callaghan, Graham Clarke, Martin Colley and Hani Hagraš **Work Group WG3**

Department of Computer Science, University of Essex

Embedding Intelligence: Research Issues for Ubiquitous Computing

Abstract. In this paper we discuss the need for new technologies to enable the full benefits of ubiquitous computing to be realised in domestic environments. We argue that a key aspect of such new technology is that of embedding intelligence into devices. We do this by explaining the enhanced functionality that embedded-intelligence can provide to everyday products. In particular we describe how intelligence is the key to groups of artefacts learning to work together to achieve higher level, user-determined goals. We outline a scenario for an “Intelligent Domestic Environment” based on an Intelligent Student Dormitory (iDorm) being built at the University of Essex that will allow experimentation on “cognitive disappearance” of explicit control of devices arising from a networked system of intelligent artefacts. We explain the challenges facing those seeking to develop methods of embedding intelligent into computationally compact and distributed co-operating artefacts. Finally we summarise our arguments as to why “cognitive disappearance” requires intelligent artefacts and describe some of the projects we are working on that address these underlying research issues.

Guy Dewsbury, Bruce Taylor, Martin Edge **Work Group WG3**

Scottish Centre for Environmental Design Research, Robert Gordon University

The Process of Designing Appropriate Smart Homes

Abstract. Information and Communication Technology (ICT) has recently been relocated from an external entity brought into the home, to an internal feature of the domestic environment extending the range of the home beyond the ‘bricks and mortar’. Whilst other European countries such as Germany and Sweden have embraced the technology for its environmental and functional properties, the UK has been slow to adopt smart home technology except as a toy for the rich and famous. A number of research projects have considered the use of smart home technology within a range of social spheres, demonstrating the technology for a wide range of people with differing levels of disabilities and older people whilst developing a software suite that enables people to design smart homes that reflect people’s needs. Smart homes can be useful; enhancing the quality of life for people whose life is limited by their domestic environment. This paper seeks to consider how smart home technology can be incorporated appropriately within the design process, exploring the difficulties in determining the most appropriate type of technology to meet the needs of people. The paper concludes with a set of guidelines to inform future designs within this area.

Andy Crabtree, Terry Hemmings and Tom Rodden **Work Group WG3**

The School of Computer Science, The University of Nottingham

Domestic Legacy and Design

Abstract. A great many approaches to the design of domestic technologies are revolutionary in character, seeking to construct the home anew. By way of contrast we articulate a post-revolutionary perspective, which seeks to build the future on top of the domestic legacy. Treated as a legacy problem, design for the domestic environment is seen to rely on an appreciation of the social organization of the domestic space, within which systems are embedded and used. We address the

1st Equator IRC Workshop on Ubiquitous Computing, 13-14 Sept 2001, Nottingham UK

methodological problem of making the domestic legacy available to design, advocating the adoption of a pattern language framework derived from the architectural evaluation of the uses of buildings. We consider the role of patterns of technology usage in a design context.

Kieth Cheverst, Adrain Friday, Stewart Kember and Peter Phillips **Work Group WG2**
Computing Department, Lancaster University

CSEG Design Work in Progress

Abstract. An introduction to CSEG's recent work which has grown to encompass the emerging domains of ubiquitous and mobile computing. The Lancaster group take a highly practical and situated approach to their research; involving real end-user communities and favouring the deployment of real demonstrator systems - an approach typified by their work on context-aware and adaptive mobile systems in the ground-breaking GUIDE project. In this session they provide an overview of their work on the Equator IRC project.

Andy Boucher, Bill Gaver, Sarah Pennington and Brendan Walker **Work Group WG3**
Computer Related Design Studio, The Royal College of Art

The Cultural Probes Project

Abstract. The CRD Studio's Home Technologies project, under the eliving and working theme, will develop novel applications of digital technology for the home environment. Two fundamental hypotheses underlie their approach:

- ❑ Technologies for the home should not import the values of the workplace (e.g. efficiency, productivity), but instead support the values and activities that distinguish home from work or public places.
- ❑ People's home lives are varied, rich, and characterised by multiple layers of emotional and historical meaning. Rather than designing generic products for 'average' families, the CRDS group intend to design for idiosyncratic individuals. The hypothesis is that designing for a particular set of circumstances will uncover unexpected possibilities that generalise to a wider range of people.

They are therefore pursuing the project process a user-centred, design-driven process. The trajectory they are following over this first year of Equator starts with design-driven methods for understanding people- cultural probes, followed by concept proposals and technology explorations, and tests of novel configurations of technologies situated in participants' homes.