



Nottingham, England

# UbiComp 2004

The Sixth International Conference on Ubiquitous Computing

## *Conference Programme*

## **Welcome from the Chair**

Tom Rodden  
Professor of Computer Science  
University of Nottingham



### **Welcome to UbiComp 2004 !**

Welcome to Nottingham for UbiComp 2004. I hope that you will take the opportunity to see, hear about and experience world leading research in ubiquitous computing throughout the four days of the conference and that you enjoy your visit to Nottingham.

The diversity of research traditions involved in ubiquitous computing is reflected throughout the programme. This year's conference includes two keynotes that demonstrate the breadth of the ubiquitous computing community. Janet Abrams who directs the Design Institute at the University of Minnesota will present a plenary which explores many of the issues raised by ubiquitous computing from a design perspective. Turing award winner Robin Milner will present a closing plenary that explores the fundamental computational issues in ubiquitous computing.

The UbiComp technical area chairs, committees and reviewers have done an excellent job in assembling a high quality technical programme. The main conference programme is complemented by a diverse collection of workshops on the Tuesday. The demo programme will allow you to experience a diverse set of ubiquitous computing concepts and technologies and we have a dedicated reception to allow you to do this and to explore the range of posters making up our poster programme. Our technical paper programme has assembled a very high quality collection of papers from the high number of submissions and I am sure that the programme will stimulate interest and debate among all attendees.

A conference is also about research community; the meeting of new researchers and the renewal of old friendships is a key aspect of any conference. Consequently, our technical programme is complemented by an extensive social programme. Each evening we provide a reception to allow you to meet other researchers in an informal manner. Our conference banquet will be held at Kelham Hall on the Thursday evening and we hope that you take the opportunity to enjoy yourself.

Conference organisation involves considerable hard work by a large number of people. I would like to thank all of the people who have made this conference possible. The various chairs, conference committee members and reviewers have worked hard to ensure the conference is of the highest possible standard. Local organisers have provided the logistical support that has made it possible to host the conference at Nottingham. The hard work that these people have put in means we can now enjoy a stimulating and interesting conference.

However, the conference could not take place without the hard work of the many authors who submitted to UbiComp 2004. I would like to thank all the authors for choosing UbiComp 2004 and helping make it the leading conference in ubiquitous computing.

I would also like to express my gratitude for the financial support provided by our benefactors (Intel, Nokia) and sponsors (FXPAL, Microsoft Research, Samsung, SMART, EPSRC) and to all the organisations that have provided direct and indirect support for the people and activities involved in the conference.

Finally, I would like to thank you all for attending the conference. The attendees make successful conferences and I encourage you to help us make UbiComp 2004 a conference to remember by participating fully in all aspects of the conference.

I hope you enjoy your visit to Nottingham and UbiComp 2004.

Tom Rodden

## Contents

### Benefactors



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## Conference at a Glance

### Conference at a Glance – Papers by Keywords

	Tuesday	Wednesday	Thursday	Friday
09:00	Workshops and Doctoral Colloquium	<b>Welcome &amp; Opening Keynote</b> <b>Ludic(rous) Pursuits: the B.U.G., the blog, and other social/spatial contagions</b> <i>Dr Janet Abrams</i>	<b>Paper Session 3</b> Sensor Installation Rapid Authoring CAMP: Poetry Interface	<b>Paper Session 7</b> ContextCam MouseField Location-aware Device
10:30		Coffee Break	Coffee Break	Coffee Break
11:00		<b>Paper Session 1</b> CareNet Display Peripheral Info Awareness Tagged Objects	<b>Paper Session 4</b> Capture Applications Work Environments Mobile Interactions	<b>Paper Session 8</b> DOLPHIN Carrot Approach ActiveBelt
12:30		<b>LUNCH</b>	<b>LUNCH</b>	<b>LUNCH</b>
14:00		<b>Paper Session 2</b> Displaying Uncertainty Error of our Ways Particle Filters	<b>Paper Session 5</b> WatchMe Context-Aware Computing Cooperative Artefacts	<b>Paper Session 9</b> Memory Aid Infrastructures/Discontents Opportunity Knocks
15:30		Coffee Break	Coffee Break	Coffee Break
16:00		<b>1-minute Madness</b> Whirlwind preview of Posters and Demos	<b>Paper Session 6</b> Unobtrusive Detection NearMe	<b>Closing Keynote</b> <b>A Grand Challenge: The Global Ubiquitous Computer</b> <i>Professor Robin Milner</i>
17.30				<b>Town Meeting</b>
19:00	Light Buffet with Cash Bar for Workshop Delegates	<b>Demonstrations, Poster &amp; Video Reception</b>  Barbecue and Cash Bar	<b>Conference Banquet</b>  Kelham Hall	

## Workshops

Tuesday, September 7<sup>th</sup>

09.00-17.30

### **W1. AIMS 2004: Artificial Intelligence in Mobile Systems**

*Jörg Baus (Saarland University, Germany)*  
*Christian Kray (University of Lancaster, UK)*  
*Robert Porzel (European Media Lab, Germany)*  
URL: <http://w5.cs.uni-sb.de/~baus/aims04>

### **W2. Applications of Location-Aware Computing**

*Anthony LaMarca (Intel Research, Seattle, USA)*  
*James Scott (Intel Research, Cambridge, UK)*  
*Ian Smith (Intel Research, Seattle, USA)*  
URL: <http://seattle.intel-research.net/lac2004>

### **W3. Playing with Sensors: exploring the boundaries of sensing for playful ubiquitous computing**

*Steve Benford (University of Nottingham, UK)*  
*Steffan Bjork (PLAY Interactive Institute, Göteborg, Sweden)*  
*William Gaver (Royal College of Art, UK)*  
*Regan Mandryk (Simon Fraser University, Burnaby BC, Canada)*  
*Carsten Magerkurth (Fraunhofer IPSI, Germany)*  
*Matthew Chalmers (University of Glasgow, UK)*

### **W4. UbiComp Privacy: Current Status and Future Directions**

*John Canny (University of California at Berkeley, USA)*  
*Jason Hong (University of California at Berkeley, USA)*  
*Alessandro Acquisti (Carnegie Mellon University, USA)*  
*Marc Langheinrich (ETH, Zurich)*

### **W5. Giving Help at a Distance**

*Peter Tolmie (XRCE Grenoble, France)*  
*Antonietta Grasso (XRCE Grenoble, France)*  
*Jacki O'Neill (XRCE Grenoble, France)*  
*Stefania Castellani (XRCE Grenoble, France)*  
*Andy Crabtree (University of Nottingham, UK)*  
*Boriana Koleva (University of Nottingham, UK)*  
URL: <http://www.xrce.xerox.com/competencies/work-practices/workshopcall.html>

### **W6. 2nd International Workshop on Ubiquitous Systems for Supporting Social Interaction and Face-to-Face Communication in Public Spaces**

*Harry Brignull (University of Sussex, UK)*  
*Tanzeem Choudhury (Intel Research, Seattle, USA)*  
*Shahram Izadi (University of Nottingham, UK)*  
*Volodymyr Kindratenko (National Center for Supercomputing Applications, IL, USA)*  
*Norbert Streitz (Fraunhofer IPSI, Germany)*  
URL: <http://www.dynamo-interactive.com/ubicomp04/>

**W7. UbiHealth 2004: 3rd International Workshop on Ubiquitous Computing for Pervasive Healthcare Applications**

*Tim Adlam (Royal United Hospital, Bath, UK)*

*Howard Wactlar (Carnegie Mellon University, Pittsburgh, USA)*

*Ilkka Korhonen (VTT Information Technology, Finland)*

URL: <http://www.pervasivehealthcare.com/ubicomp2004/>

**W8. UbiSys 2004: International Workshop on System Support for Ubiquitous Computing**

*Manuel Roman (DoCoMo Labs, USA)*

*Christian Becker (University of Stuttgart, Germany)*

*Roy H. Campbell (University of Illinois, USA)*

*Adrian Friday (University of Lancaster, UK)*

URL: <http://ubisys.cs.uiuc.edu/>

**W9. UbiComp in the Urban Frontier**

*Eric Paulos (Intel Research, Seattle, USA)*

*Ken Anderson (Intel Research, Seattle, USA)*

*Anthony Townsend (New York University, USA)*

URL: <http://www.urban-atmospheres.net/UbiComp2004>

**W10. Ubiquitous Display Environments**

*Gerd Kortuem (University of Lancaster, UK)*

*Antonio Krüger (Saarland University, Germany)*

*Alios Ferscha (University of Linz, Austria)*

URL: <http://ubicomp.lancs.ac.uk/workshops/ubidisplay04>

**W12. Workshop on Advanced Context Modelling, Reasoning and Management**

*Jadwiga Indulska (University of Queensland, Australia)*

*David De Roure (University of Southampton, UK)*

URL: [http://pace.dstc.edu.au/UbiComp2004\\_ContextWorkshop.html](http://pace.dstc.edu.au/UbiComp2004_ContextWorkshop.html)

**Doctoral Colloquium**

Tuesday, September 7<sup>th</sup>

09.00-17.30

## Technical Programme

### Opening Plenary: Ubiquity/Urbiqutiy: the B.U.G. and other Ludic(rous) Pursuits

Wednesday, September 8<sup>th</sup>

09.00-10.30

Main Lecture Room



**Dr Janet Abrams**

Director, Design Institute  
University of Minnesota

#### ABSTRACT

In the last few years, the city has (re)emerged as a vibrant locus of experiment in social computing. Projects by artists, game designers, and new media researchers have attempted to re-imagine urban space — and to illustrate the potential for individual and collective experience therein — by threading various types of digital communication into the physical environment. Are these projects reactions to the numbing anomie of desktop, deskbound computing, a rediscovery of 'meat space' by a generation wearying of the smoothnesses of the virtual realm? Are they ripostes, in fact, to the cherished fantasy of 'ubiquitous' computing which, in its strivings for technology 'everywhere, all the time', tends instead towards a kind of 'no-where'? Taking several such experiments — tentative, flawed, humorous, indeed ludic(rous) — as examples, this talk will ask what this 'return to the city' represents. It will argue that the hitherto segregated tribes of urban design/architecture and of interaction design/communications need to come together, to celebrate the particularities of place, and the richness of difference — between individual lives, between city blocks and neighborhoods, between urban cultures — so as to enable more realistic engagement with the world we actually live in.

#### BIOGRAPHY

Dr. Janet Abrams is Director of the University of Minnesota's Design Institute, which commissions, publishes and produces innovative designs for the public realm, detailed at <http://design.umn.edu>. The DI's major programs include Design Camp for teens, held for the third consecutive year in July 2004, and the Big Urban Game (B.U.G.), held in Minneapolis and St Paul in September 2003.

Janet joined the University of Minnesota in November 2000 after a twenty-year career as a critic and independent producer in the fields of architecture, design and the visual arts, working in New York, Amsterdam, Chicago and her native London. Her writings have appeared, inter alia, in I.D. Magazine, frieze, Domus, the New York Times and The Independent, and in several books, most recently "Profile: Pentagram Design" (Phaidon, 2004) which features her essay on interactive media designer Lisa Strausfeld. She is the editor of "IF/THEN: PLAY – Design Implications of New Media" (NDI/BIS, 1998), published in tandem with the Netherlands Design Institute's fifth Doors of Perception conference, for which she served on the Programming Team. Janet is currently completing "ELSE/WHERE: MAPPING," a 256-page anthology on mapping of networks, territories and ideas, co-edited with DI Senior Editor Peter Hall, and designed by "IF/THEN" art directors Mevis & van Deursen in collaboration with DI Design Fellow Deborah Littlejohn (Design Institute, 2004).

Janet holds a Bachelor's degree in Architecture from University College, London, and a Ph.D. in Architectural History, Theory and Criticism from Princeton University. In her off-hours, she is an avid swimmer, photographer (especially of wildlife, urban and otherwise) and collector of laundry detergent packaging from around the world.

## **Paper Session 1**

Wednesday 11:00-12:30

Chair: Lars Erik Holmquist, Viktoria Institute, Sweden

### **The CareNet Display: Lessons Learned from an In Home Evaluation of an Ambient Display**

Sunny Consolvo, Peter Roessler, and Brett Shelton  
Intel Research Seattle

### **Personalized Peripheral Information Awareness through Information Art**

John Stasko, Todd Miller, Christopher Plaue, Zachary Pousman, and Osman Ullah  
Georgia Institute of Technology

### **Reminding about Tagged Objects using Passive RFIDs**

Gaetano Borriello, Waylon Brunette, Matthew Hall, Carl Hartung, and Cameron Tangney  
University of Washington

## **Paper Session 2**

Wednesday 14:00-15:30

Chair: Hans Gellersen, Lancaster University, UK

### **Evaluating the Effects of Displaying Uncertainty in Context-Aware Applications**

Stavros Antifakos<sup>1</sup>, Adrian Schwaninger<sup>2</sup>, and Bernt Schiele<sup>1</sup>  
<sup>1</sup> ETH Zurich, <sup>2</sup> University of Zurich

### **The Error of our Ways: The experience of Self-Reported Position in a Location-Based Game**

Steve Benford<sup>1</sup>, Will Seagar<sup>1</sup>, Martin Flintham<sup>1</sup>, Rob Anastasi<sup>1</sup>, Duncan Rowland<sup>1</sup>, Jan Humble<sup>1,3</sup>, Danae Stanton<sup>1</sup>, John Bowers<sup>1</sup>, Nick Tandavanitj<sup>2</sup>, Matt Adams<sup>2</sup>, Ju Row Farr<sup>2</sup>, Amanda Oldroyd<sup>3</sup>, and Jon Sutton<sup>3</sup>  
<sup>1</sup> University of Nottingham, <sup>2</sup> Blast Theory, London, <sup>3</sup> BT Exact, Ipswich

### **Particle Filters for Location Estimation in Ubiquitous Computing: A Case Study**

Jeffrey Hightower and Gaetano Borriello  
Intel Research Seattle and University Of Washington

## **1 Minute Madness**

Wednesday 16:00-17:30

Chair: Ian Smith, Intel Research, USA

Authors of Demonstrations, Posters and Videos will each take a 1-minute turn providing a brief glimpse of their work, hoping to encourage you to visit them during the Demo and Poster Reception (immediately after this session) or one of the breaks. No questions will be allowed during this fast paced, high-energy event; instead, attendees are encouraged to save their questions for individual follow ups with the authors.

## **Demonstrations, Posters and Video Reception**

Wednesday 18:30-22:00

Come meet and interact with the authors and their work during this special event. A full buffet will be provided alongside the cash bars in the East Midlands centre. .

### **Paper Session 3**

Thursday 09:00-10:30

Chair: Michael Beigl, University of Karlsruhe, Germany

#### **Some Assembly Required: Supporting End-User Sensor Installation in Domestic Ubiquitous Computing Environments**

Chris Beckmann<sup>1</sup>, Sunny Consolvo<sup>2</sup>, and Anthony LaMarca<sup>2</sup>  
<sup>1</sup> University of California, Berkeley, <sup>2</sup> Intel Research Seattle

#### **Rapid Authoring of Mediascapes**

Richard Hull<sup>1</sup>, Ben Clayton<sup>2</sup>, and Tom Melamed<sup>2</sup>  
<sup>1</sup> Hewlett-Packard Laboratories, <sup>2</sup> University of Bristol

#### **CAMP: A Magnetic Poetry Interface for End-User Programming of Capture Applications for the Home**

Khai N. Truong, Elaine M. Huang, and Gregory D. Abowd  
Georgia Institute of Technology

### **Paper Session 4**

Thursday 11:00-12:30

Chair: Yvonne Rogers, Indiana University, USA

#### **Designing Capture Applications to Support the Education of Children with Autism**

Gillian Hayes<sup>1</sup>, Julie Kientz<sup>1</sup>, Khai Truong<sup>1</sup>, David White<sup>1</sup>, Gregory Abowd<sup>1</sup>, and Trevor Pering<sup>2</sup>  
<sup>1</sup> Georgia Institute of Technology, <sup>2</sup> Intel Research

#### **'This all together, hon?' Ubicomp in non-office work environments**

John Sherry, Scott Mainwaring, Jenna Burrell, Richard Beckwith, and Tony Salvador  
Intel Corporation

#### **Security and Trust in Mobile Interactions: A Study of Users Perceptions and Reasoning**

Tim Kindberg, Abigail Sellen, and Erik Geelhoed  
Hewlett-Packard Laboratories

### **Paper Session 5**

Thursday 14:00-15:30

Chair: Gregory Abowd, Georgia Tech, USA

#### **WatchMe: communication and awareness between members of a closely-knit group**

Natalia Marmasse, Chris Schmandt and David Spectre  
Massachusetts Institute of Technology

#### **Everyday Encounters with Context-Aware Computing in a Campus Environment**

Louise Barkhuus<sup>1</sup> and Paul Dourish<sup>2</sup>  
<sup>1</sup> The IT University of Copenhagen, <sup>2</sup> University of California

#### **Cooperative Artefacts: Assessing Real World Situations with Embedded Technology**

Martin Strohbach, Hans Gellersen, Gerd Kortuem, and Christian Kray  
Lancaster University

## Paper Session 6

Thursday 16:00-17:00

Chair: Matthew Chalmers, Glasgow University, UK

### **I Sense a Disturbance in the Force: Long-range Detection of Interactions with RFID-tagged Objects**

Kenneth Fishkin<sup>1</sup>, Bing Jiang<sup>1,2</sup>, Matthai Philipose<sup>1</sup>, and Sumit Roy<sup>2</sup>

<sup>1</sup> Intel Research Seattle, <sup>2</sup> University of Washington

### **The NearMe Wireless Proximity Server**

John Krumm and Ken Hinckley

Microsoft Research

## Town Meeting

Thursday 17:30-18:30

Hear about plans for future UbiComp events and opportunities to be involved in helping shape these. Share your views about the past, present and future of UbiComp, the conference and/or the field.

## Conference Banquet

Thursday 20:00-24:00

Kelham Hall

Newark, Nottinghamshire



The conference banquet will be held in Kelham Hall, a 45 minute bus ride from the Conference Centre. Music will be provided by the powerful harmonies and rock-solid rhythms of Moose Malloy ([www.moosemalloy.com](http://www.moosemalloy.com)).

Buses have been arranged from the city centre hotels and Cavendish Hall on the following schedule:

Departing:	Cavendish Hall	7.00 pm
	Rutland Hotel	6.45 pm
	Harts Hotel	7.00 pm
	Citilodge Hotel	6.45 pm
	Royal Moat House Hotel	7.00 pm

At the end of the evening, all buses will depart Kelham Hall at midnight.

The cost of this event is included in the conference registration; additional banquet tickets can be purchased for £50 each.

## **Paper Session 7**

Friday 09:00-10:30

Chair: Alois Ferscha, Johannes Kepler Universität Linz, Austria

### **The ContextCam: Automated Point of Capture Video Annotation**

Shwetak N. Patel, and Gregory D. Abowd

Georgia Institute of Technology

### **MouseField: A Simple and Versatile Input Device for Ubiquitous Computing**

Toshiyuki Masui<sup>1</sup>, Koji Tsukada<sup>2</sup>, and Itiro Siio<sup>3</sup>

<sup>1</sup> AIST, <sup>2</sup> Keio University, <sup>3</sup> Tamagawa University, Japan

### **The Iterative Design Process of a Location-aware Device for Group Use**

Holger Schnädelbach<sup>1</sup>, Boriana Koleva<sup>1</sup>, Mike Twidale<sup>2</sup>, Steve Benford<sup>1</sup>

<sup>1</sup> University of Nottingham, <sup>2</sup> University of Illinois

## **Paper Session 8**

Friday 11:00-12:30

Chair: James Scott, Intel Research, Cambridge, UK

### **DOLPHIN: A Practical Approach for Implementing a Fully Distributed Indoor Ultrasonic Positioning System**

Masateru Minami<sup>1</sup>, Yasuhiro Fukuju<sup>2</sup>, Kazuki Hirasawa<sup>1</sup>, Shigeaki Yokoyama<sup>1</sup>, Moriyuki Mizumachi<sup>1</sup>, Hiroyuki Morikawa<sup>2</sup>, and Tomonori Aoyama<sup>2</sup>

<sup>1</sup> Shibaura Institute of Technology, <sup>2</sup> University of Tokyo

### **The Carrot Approach: Encouraging use of location systems**

Kieran Mansley, Alastair R. Beresford and David Scott

Cambridge University

### **ActiveBelt: Belt-type Wearable Tactile Display for Directional Navigation**

Koji Tsukada and Michiaki Yasumura

Keio University

## **Paper Session 9**

Friday 14:00-15:30

Chair: Nigel Davies, Lancaster University, UK

### **An Audio-Based Personal Memory Aid**

Sunil Vemuri, Chris Schmandt, Walter Bender, Stefanie Tellex, Brad Lassey

Massachusetts Institute of Technology

### **Infrastructures and Their Discontents: Implications for UbiComp**

Scott Mainwaring, Michele F. Chang, and Ken Anderson

Intel Research

### **Opportunity Knocks: a System to Provide Cognitive Assistance with Transportation Services**

Donald J. Patterson, Lin Liao, Krzysztof Gajos, Michael Collier, Nik Livic, Katherine Olson, Shiaokai

Wang, Dieter Fox, Henry Kautz

University of Washington

## Closing Plenary: A Grand Challenge: The Global Ubiquitous Computer

Friday, September 10<sup>th</sup>

16.00-17.30

Main Lecture Room



### Robin Milner

Professor of Computer Science  
University of Cambridge, UK

#### ABSTRACT

The UK Computing Research Committee has launched a programme of Grand Challenges, to focus the long-term aspirations of the computing research community (national and international) both in science and in engineering. At present there are seven proposals for such challenges, arising from ideas submitted to a workshop in 2002. For each proposal there is a core group of researchers aiming to form a road-map.

Two of these proposed Challenges involve what may be called the Global Ubiquitous Computer; it subsumes both the Internet and instrumented environments. Its name reflects the reasonable prediction that, within two decades, virtually all computing agents (heart-monitors, satellites, laptops, ...) will be interconnected, forming an organism that is partly artefact and partly natural phenomenon -- in either case one of the most complex ever constructed or studied. What models help us to understand it? What engineering principles can cope with the vast range of magnitudes involved?

My lecture will consider how to begin to address these two Challenges. Very many concepts are involved. They include authenticity, beliefs, connectivity, compilation, continuum, data-protection, delegation, duties, provenance, failure, intentions, locality, model-checking, mobility, obligations, reflectivity, security, simulation, specification, stochastics, trust, and many more.

Models are needed that explain and implement some of these concepts in terms of others. I shall end the lecture by describing some of my own work in modelling connectivity, locality and mobility. These notions arise naturally out of our existing models of concurrent computation, and can help to lay a foundation for global ubiquitous computation.

#### BIOGRAPHY

Robin Milner graduated from Cambridge University, and has held positions at the University of Cambridge, the University of Edinburgh, Aarhus University, Stanford University and City University, London. He has an honorary degree from Göteborg University (Sweden) and is a member of the Royal Society. In 1992, the Association Computing Machinery, the leading computer science association, gave him its Turing Award. He has made fundamental contributions to information science and particularly to computer programming theory. In particular, his Logic for Computable Functions, universally referred to as LCF, is considered a milestone in the history of computer assisted logic and the instruments used in the formulation of assertions on programs, programming languages and computing systems. He also introduced ML (Meta-Language), a special programming language for the formulation of fundamental concepts in computer assisted logic. ML is widely used as a teaching language and as an advanced programming language for complex non-numerical problems. LCF and ML have inspired many of the languages and instruments used by computer designers, information system programmers and mathematicians working on non-trivial theorems.

## **Demonstrations**

### **Demonstrations**

Wednesday, September 8<sup>th</sup>

18:30-22:00

1. **Audio Location: Accurate Low-Cost Location Sensing**  
James Scott  
Intel Research Cambridge  
Boris Dragovic  
University of Cambridge Computer Laboratory
2. **bYOB (Build Your Own Bag): A Computationally-Enhanced Modular Textile System**  
Gauri Nanda, V. Michael Bove Jr., Adrian Cable  
Media Lab, Massachusetts Institute of Technology
3. **Context-Based Seamless Network and Application Control**  
Masugi Inoue, Mikio Hasegawa, Nobuo Ryoki  
National Institute of Information and Communications Technology  
Hiroyuki Morikawa  
The University of Tokyo
4. **Detection of Safety Hazards Using Cooperating Chemical Containers**  
Martin Strohbach, Gerd Kortuem, Hans-Werner Gellerson, Christian Kray  
Computing Department, Lancaster University
5. **ECT: A Toolkit to Support Rapid Construction of UbiComp Environments**  
Chris Greenhalgh, Shahram Izadi, James Mathrick, Jan Humble, Ian Taylor  
School of Computer Science, University of Nottingham
6. **eXspot: A Wireless RFID Transceiver for Recording and Extending Museum Visits**  
Sherry Hsi, Rob Semper  
The Exploratorium  
Waylon Brunette  
Department of Computer Science and Engineering, University of Washington  
Adam Rea, Gaetano Borriello  
Intel Research Seattle
7. **Fast, Detailed Inference of Diverse Daily Human Activities**  
Matthai Philipose, Sunny Consolvo, Tanzeem Choudhury, Kenneth Fishkin, Mike Perkowitz, Ian Smith  
Intel Research Seattle  
Dieter Fox, Henry Kautz, Donald Patterson  
Department of Computer Science and Engineering, University of Washington
8. **GLOWBITS**  
Daniel Hirschmann  
Interactive Telecommunications Program, New York University
9. **iBand: A Wearable Device for Handshake-Augmented Interpersonal Information Exchange**  
Marije Kanis, Stefan Agamanolis, Cian Cullinan, Anna Gavin  
Human Connectedness Group, Media Lab Europe  
Niall Winters  
London Knowledge Lab, Institute of Education, University of London
10. **KU: iyashikei-net**  
Urico Fujii, Ann Poochareon  
Interactive Telecommunications Program, New York University
11. **Malleable Mobile Music**  
Atau Tanaka  
Sony Computer Science Laboratory Paris

12. **MITes: Wireless Portable Sensors for Studying Behaviour**  
Emmanuel Manguia Tapia, Natalia Marmasse, Stephen S. Intille, Kent Larson  
Massachusetts Institute of Technology
13. **MobiTip: Using Bluetooth as a Mediator of Social Context**  
Åsa Rudström, Martin Svensson, Rickard Cöster, Kristina Höök  
Swedish Institute of Computer Science
14. **MouseField: A Simple and Versatile Input Device for Ubiquitous Computing**  
Toshiyuki Masui  
National Institute of Advanced Industrial Science and Technology (AIST)  
Koji Tsukada  
Keio University  
Itiro Siio  
Tamagawa University
15. **Multi-Hop on Table-Top: A Scalable Evaluation Workbench for Wireless Ad-Hoc/Sensor Network Systems**  
Gaute Lambertsen, Yu Enokibori, Kazuhiro Takeda, Kiyoto Tani, Koji Shuto, Nobuhiko Nishio  
Department of Computer Science, Ritsumeikan University  
PRESTO 21: Intelligent Cooperation and Control, JST
16. **Practical Considerations using eSeals**  
Albert Krohn, Michael Beigl, Christian Decker, Philip Robinson, Tobias Zimmer  
Telecooperation Office, Universität Karlsruhe
17. **Prototyping Applications For the Physical World Using Integrated Capture/Playback Facilities**  
Steven Dow, Blair MacIntyre  
College of Computing, Georgia Institute of Technology  
Maribeth Gandy  
Interactive Media Technology Center, Georgia Institute of Technology  
Jay David Bolter  
School of Literature, Communication and Culture, Georgia Institute of Technology
18. **Ringling the Doorbell - Configuring Sensor Networks**  
Bernard Horan, David Anderson, James "Bo" Begole, Gabriel Montenegro, Stéphane Perret, Randall Smith, Robert Tow, Bruno Zoppis  
Sun Microsystems Laboratories, Europe
19. **Sculpting Home Atmospheres**  
Philp Ross  
Faculty of Industrial Design, Technische Universiteit Eindhoven  
David Keyson  
Faculty of Industrial Design Engineering, Delft University of Technology
20. **Seamful Games**  
Matthew Chalmers, Marek Bell, Malcolm Hall, Scott Sherwood, Paul Tennent  
Computing Science, University of Glasgow
21. **Sharing Memories: "The Ubicomp Scrapbook"**  
Aaron Quigley, David West  
School of Information Technology, University of Sydney
22. **Supporting Collaborative Scheduling with Interactive Pushpins and Networking Surfaces**  
Fredrik Helin, Theresia Höglund, Robert Zackaroff  
ISD, IT-University of Göteborg  
Maria Håkansson, Sara Ljungblad, Lars Erik Holmquist  
Future Applications Lab, Viktoria Institute
23. **tunA: Synchronised Music-Sharing on Handheld Devices**  
Arianna Bassoli, Julian Moore, Stefan Agamanolis  
Human Connectedness Group, Media Lab Europe

24. **u-Photo Tools: Photo-based Application Framework for Controlling Networked Appliances and Sensors**

Genta Suzuki, Daisuke Maruyama, Shun Aoki, Takeshi Iwamoto, Kazunori Takashio  
Graduate School of Media and Governance, Keio University

Hideyuki Tokuda

Faculty of Environmental Information, Keio University

25. **Using Camera-Phones to Enhance Human-Computer Interaction**

Anil Madhavapeddy, David Scott

Computer Laboratory, University of Cambridge

Richard Sharp, Eben Upton

Intel Research Cambridge

### Posters

Wednesday, September 8<sup>th</sup>

18:30-22:00

1. **3-D Representation of Video Sequences Acquired from Ubiquitous Sensor Environment**  
Shoichiro Iwasawa, Sadanori Ito  
ATR Media Information Science Laboratories  
Yusuke Otaka, Yasuyuki Sumi  
Graduate School of Informatics, Kyoto University  
Kenji Mase  
Information Technology Center, Nagoya University
2. **A Bind Control Model for Real-Space Programming in Ubiquitous Computing Environment**  
Takuya Kashima, Shunsake Saruwatari, Hiroyuki Morikawa, Tomonori Aoyama  
The University of Tokyo
3. **A File Migration Architecture for Pervasive Systems**  
Adam Hudson, Bob Kummerfield, Aaron Quigley  
School of Information Technologies, University of Sydney
4. **A Framework for Ubiquitous Web Service Discovery**  
Alastair Carter, Maja Vukovic  
University of Cambridge Computer Laboratory
5. **A Layered Structure of Human Interaction Interpretations**  
Masashi Takahashi, Yasuyuki Sumi, Toyoaki Nishida  
Graduate School of Informatics, Kyoto University  
Sadanori Ito, Megumu Tsuchikawa  
ATR Media Information Science Laboratories  
Kiyoshi Kogure  
ATR Intelligent Robotics and Communication Laboratories  
Kenji Mase  
Information Technology Center, Nagoya University
6. **A Proposal for Context Data Markup Language**  
Mitsuru Minakuchi  
National Institute of Information and Communications Technology
7. **A System for Radio Tracking of Team-Sports Players**  
Lukas Kencl, Marcelo Pias  
Intel Research Cambridge  
Steve Pennock, Alan Bramley, David Kerwin, Peter Shepherd, Grant Trewartha  
University of Bath
8. **A Three-Tier Architecture for Location Presentation**  
Christan Decker, Michael Beigl, Albert Krohn, Philip Robinson, Tobias Zimmer, Jun Ma  
TecO, University of Karlsruhe
9. **Ad-Hoc Networking Support for Pervasive Collaboration**  
Michael S. Thompson, William O. Plymale, Creighton T. Hager, Kevin Henderson, Scott F. Midkiff, Luiz A. DaSilva, Nathaniel J. Davis, Jahng S. Park  
Bradley Department of Electrical and Computer Engineering, Virginia Tech
10. **ANS (Autonomic Networked System) for Ubiquitous Computing**  
Julia A. McCann, Asher Hoskins, Gawesh Jawaheer  
Department of Computing, Imperial College
11. **Applying Logistic Regression for Activity Recognition**  
Fahd Al-Bin-Ali  
Computer Science Department, University of Arizona  
Nigel Davies  
Computing Department, Lancaster University

12. **Art, Information and Office Door Displays**  
 Ian Frank, Haruhide Sekifuji  
 Future University-Hakodate
13. **Augmenting Paper-Based Work Practices**  
 Sara Ljungblad, Maria Håkansson, Lars Erik Holmquist  
 Future Applications Lab, Viktoria Institute  
 Magnus Bång, Erik Berglund, Anders Larsson  
 Santa Anna IT Research Institute
14. **Benefits and Challenges of Tabletop Peripheral Displays**  
 Meredith Ringel Morris  
 Stanford University
15. **Blue Track - Imperceptible Tracking of Bluetooth Devices**  
 Marc Haase, Matthias Handy  
 University of Rostock
16. **Digital Street Game: Location-Based Game as Research Probe**  
 Michele Chang  
 People and Practices Research, Intel Corporation  
 Elizabeth Goodman  
 confectious design
17. **Enhanced Experience of Sport Events**  
 Josef Hallberg, Sara Svensson, Kåre Synnes  
 Luleå University of Technology, Department of Computer Science and Electrical Engineering, Division of  
 Media Technology
18. **Experience Summarization in a Ubiquitous Environment**  
 Atsushi Nakahara, Megumu Tsuchikawa  
 ATR-MIS  
 Ken Kumagai, Yasuyuki Sumi  
 Kyoto University  
 Kiyoshi Kogure  
 ATR-IRC  
 Kenji Mase  
 Nagoya University
19. **Factors in Designing Effective Ambient Displays**  
 Johanna Brewer  
 Computer Science Department, Boston University
20. **Filtering Location-Based Information Based on Visibility in the Real World**  
 Ashweeni Beeharee, Anthony Steed  
 Department of Computer Science, University College London
21. **HeadSphere: A Musical Instrument for People with Limited Mobility**  
 Christine Brumback  
 Interactive Telecommunications Program, New York University
22. **Health Monitoring System in the Bedroom using Ubiquitous Technology**  
 Jong Min Choi  
 Interdisciplinary Program in Biomedical Engineering, Seoul National University  
 Kwang Suk Park  
 Department of Biomedical Engineering, College of Medicine, Seoul National University
23. **HearWear: The Fashion of Environmental Noise Display**  
 Milena Iossifova  
 Independent Researcher  
 Younghui Kim  
 Absurdee/Missing Pixel
24. **Improving the Usability of a Wearable Input Device SCURRY(TM)**  
 Byung Seok Soh, Yoon Sang Kim, Sang-Goog Lee  
 Samsung Advanced Institute of Technology

25. **Indoor Tracking using Solar Cell Powered System: Interpolation of Irradiance**  
Julian Randall, Nagendra B. Bharatula, Niroshan Perera, Thomas von Büren, Stijn Ossevoort, Gerhard Tröster  
Wearable Computing Laboratory, Department of Electronics, Swiss Federal Institute of Technology
26. **IntelliVision**  
Christine Brumback, Liubo Borrisov, Jeffrey Galusha  
Interactive Telecommunications Program, New York University  
Annette Dilorio  
The Pediatric Center, New York Foundling Hospital
27. **InteractionScope: Non-fixed Wearable Positioning for Location-aware System**  
Sadanori Ito, Shoichiro Iwasawa  
ATR Media Information Science Laboratories  
Kiyoshi Kogure, Norihiro Hagita  
ATR Intelligent Robotics and Communications Laboratories  
Yasuyuki Sumi  
Graduate School of Informatics, Kyoto University  
Kenji Mase  
Information Technology Center, Nagoya University
28. **Interactive Storytelling with Captured Video**  
Norman Lin  
Graduate School of Information Science, Nagoya University  
Kenji Mase  
Information Technology Center, Nagoya University  
Yasuyuki Sumi  
Graduate School of Informatics, Kyoto University  
Yasuhiro Katagiri  
ATR Media Information Science Laboratories
29. **Medical eGadgets**  
Stephen Bellis, David Murphy, David Harty, John Barton, Brendan O'Flynn, Kieran Delaney, Cian O'Mathuna  
NMRC  
Nicholas Drossos, Achilles Kameas, Irene Mavrommatti  
Computer Technology Institute  
Anthony Pounds-Cornish, Arran Holmes, Martin Colley, Vic Callaghan  
University of Essex
30. **Mobile Data Transport Enabling Mobile Timetable Recharging in Rural and Remote Areas**  
Christopher Lueg, Omer Mahmood  
Interactive Business Research, Charles Darwin University
31. **MyPlace: Double-Personalised Views of Invisible Items in a Ubiquitous Computing Environment**  
David J. Carmichael, Judy Kay, Bob Kummerfeld  
School of Information Technologies, University of Sydney
32. **Open Window: Reducing Isolation for Patients**  
Cian Cullinan, Stefan Agamanolis  
Human Connectedness Group, Media Lab Europe  
Denis Roche  
4th Promise Productions  
Fran Hegarty  
St.James Hospital, Dublin
33. **Putting Systems into Place: A Study of Design Requirements for Location-Aware Community System**  
Samer Karam, Sukeshini A. Grandhi, Quentin Jones, Loren Terveen, Steve Whittaker  
New Jersey Institute of Technology , University of Minnesota , University of Sheffield
34. **Smart Vacuum Cleaner - An Autonomous Location-Aware Cleaning Device**  
Svetlana Domnitcheva  
Institute for Pervasive Computing, Swiss Federal Institute of Technology (ETH) Zurich
35. **Socialight: A Mobile Social Networking System**  
David Melinger, Karen Bonna, Michael Sharon, Mohit SantRam  
Interactive Telecommunications Program, New York University

36. **Speech Interaction with Handheld Computers in the Project54 System**  
 Kriste Krstovski, Andrew L. Kun, W. Thomas Miller III  
 Electrical and Computer Engineering Department, University of New Hampshire
37. **Supporting Mobile Context-Aware Applications through a Modular Service Infrastructure**  
 Cristiano di Flora, Stefano Russo  
 Department of Computer Science, Federico II University of Naples  
 Oriana Riva, Kimmo Raatikainen  
 Department of Computer Science, University of Helsinki
38. **The Ambient Sound Shower: Experience Sharing with Ubiquitous Sensors**  
 Christof E. Müller, Megumu Tsuchikawa  
 ATR Media Information Science Laboratories  
 Yasuyuki Sumi  
 Graduate School of Informatics, Kyoto University  
 Kenji Mase  
 Information Technology Center, Nagoya University
39. **The Boundaries of Ubiquity**  
 Wendy March, Tony Salvador, Steve Barile, Saddam Khattak, John Sherry, Richard Beckwith  
 Intel Corporation  
 Anne P. McClard  
 blue.zebu
40. **The Development of a Ubiquitous Health House in South Korea**  
 Jin Woo Seo  
 Interdisciplinary Program in Biomedical Engineering, Seoul National Engineering  
 Kwang Suk Park  
 Department of Biomedical Engineering, College of Medicine, Seoul National University
41. **U1-Chip: Wireless Communication Module for Fast Service Discovery**  
 Yuichi Taguchi, Shunsuke Saruwatari, Hiroyuki Morikawa, Tomonori Aoyama  
 The University of Tokyo  
 Mikio Hasegawa, Masugi Inoue  
 National Institute of Information and Communications Technology
42. **Ubiquitous Monitoring Environment for Wearable and Implantable Sensors (UbiMon)**  
 Jason W.P. Ng, Benny P.L. Lo, Oliver Wells, Morris Sloman, Guang-Zhong Yang  
 Department of Computing, Imperial College London  
 Nick Peters  
 Department of Cardiology, Imperial College London  
 Ara Darzi  
 Department of Surgery, Imperial College London  
 Chris Toumazou  
 Department of Bioengineering, Imperial College London
43. **Ubiquitous Service Discovery using TRIP**  
 Philip Tuddenham, Maja Vukovic  
 University of Cambridge Computer Laboratory
44. **UMBRELLA.net: Exploring Coincidence Ad-Hoc Networks**  
 Jonah Brucker-Cohen, Katherine Moriwaki, Linda Doyle  
 Disruptive Design Team, Networking and Telecommunications Research Group, Trinity College Dublin
45. **User Customization of Three-Pixel Displays**  
 Peter Tarasewich  
 College of Computer and Information Science, Northeastern University  
 Christopher S. Campbell  
 IBM Almaden Research Center
46. **u-Texture: A Self-Organizable Material for Building Smart Furniture**  
 Masao Ideuchi, Daisuke Maruyama, Tomokazu Murakami, Naohiko Kohtake, Jin Nakazawa, Kazunori Takashio, Hideyuki Tokuda  
 Graduate School of Media and Governance, Keio University
47. **Visualization for Casual Debugging and System Awareness in a Ubiquitous Computing Environment**  
 Meredith Ringel Morris  
 Stanford University

## Videos

- **Attentive Office Cubicles: Mediating Visual and Auditory Interactions Between Office Co-Workers**

Aadil Mamuji, Roel Vertegaal, Connor Dickie, Changuk Sohn  
Human Media Lab, Queen's University, Canada  
Maria Danninger  
Technische Universität München, Germany

- **The Context-Aware Pill Bottle and Medication Monitor**

Anand Agarawala, Saul Greenberg  
Department of Computer Science, Calgary, Alberta, Canada  
Geoffrey Ho  
University of Calgary, Calgary, Alberta, Canada

- **Talking Assistant - Car Repair Shop Demo**

Dirk Schnelle, Erwin Aitenbichler, Jussi Kangasharju, Max Mühlhäuser  
Telecooperation, Department of Computer Science, Darmstadt University of Technology, Germany

- **Cubic Display Device "Z-agon" -The Movie to Design Z-agon with Scenario-**

Junya Ueda  
Faculty of Environmental Information, KEIO University SFC, Kanagawa, Japan  
Takashi Matsumoto, Naohito Okude  
Graduate School of Media and Governance, KEIO University SFC, Kanagawa, Japan

- **Building Flexible Displays for Awareness and Interaction**

Kathryn Elliot, Saul Greenberg  
Department of Computer Science, University of Calgary, Calgary, Alberta, Canada

- **Mobile Music Making with Sonic City**

Lalya Gaye, Lars Erik Holmquist  
Future Applications Lab, Göteborg, Sweden

- **TACT: Mobile Wireless Terminal for Digitally-Enabled Environments**

Michimune Kohno, Yuji Ayatsuka, Jun Rekimoto  
Sony CSL, Shinagawa, Tokyo, Japan

- **User Assist Applications with Location Sensors Integration**

Udana Bandara, Mikio Hasegawa, Masugi Inoue, Masateru Minami, Hiroyuki Morikawa, Tomonori Aoyama  
Mobile Networking Group, National Institute of Information and Communications Technology, Graduate School of Information Science and Technology, The University of Tokyo, Japan

- **Tele-Reality in the Wild**

Neil J. McCurdy, William G. Griswold  
Department of Computer Science and Engineering, University of California, San Diego, USA

- **Adapting Information Through Tangible Augmented Reality Interfaces**

Patrick Sinclair, Kirk Martinez  
Intelligence, Agents, Multimedia Group, School of Electronics and Computer Science, University of Southampton, Southampton, UK

- **Can You See Me Now?**

Matt Adams, Ju Row Farr, Nick Tandavanitj  
Blast Theory, Unit 43a Regent Studios, London, UK  
Steve Benford, Martin Flintham, Adam Drozd, Rob Anastasi  
The Mixed Reality Laboratory, School of Computer Science and IT, The University of Nottingham, Nottingham, UK

- **Magic Touch — A Simple Object Location Tracking System Enabling Physical-Virtual Artefacts in Office Environments**  
Thomas Pederson  
Department of Computing Science, Umeå University, Umeå, Sweden
  
- **HELLO.WALL - Contributing To A Social Architectural Space**  
Daniel van Alphen, Carsten Magerkurth, Daniela Alina Plewe, Thorsten Prante, Carsten Röcker, Richard Stenzel, Dr. Dr. Norbert A. Streitz  
AMBIENTE - Smart Environments of the Future, Fraunhofer IPSI, Darmstadt, Germany
  
- **SimPhony: a voice communication tool for distributed workgroups**  
Vidya Lakshmipathy, Chris Schmandt  
MIT Media Lab, Cambridge, MA, USA

## **Conference Information**

### **East Midlands Conference Centre**

University of Nottingham  
University Park  
Nottingham  
NG7 2RJ

Tel: +44 (0) 115 951 4126

Fax: +44 (0) 115 951 5009



### **Registration Desk**

The conference registration desk will be situated at the main entrance doors, and will be open from 8 am to 5.30 pm each day.

### **On-Site Conference Office**

In addition to the registration desk, there will be a Conference Office on the Gallery, tel: 0115 846 6549

### **Name Badges**

Please wear your conference name badge at all times. Badges are required for entrance to all functions and for entrance to the conference banquet at Kelham Hall.

### **Tickets for Conference Banquet**

Tickets for the Kelham Hall banquet will be included with name badges. Please keep these with you as they will be required for entrance.

### **Internet Access**

There will be free wireless access across the entire Conference Centre for all delegates.

### **Parking**

There are approximately 250 car parking spaces around the area of the Conference Centre and the on-site accommodation. A permit is not required.

### **Sports Facilities**

The University sports facilities can be used at no cost by those resident in Cavendish and Ancaster Halls on production of a room key. A charge is made for external delegates.

### **Smoking**

Smoking is prohibited throughout the Centre.

### **Message Centre**

A message board will be located in the main corridor.

### **Audio/Video Recording**

The use of audio/video recording equipment by conference attendees is prohibited, except where approved by the Conference Chair.

### **Taxis**

Local taxi services are:

Cable Cars - 0115 922 9229

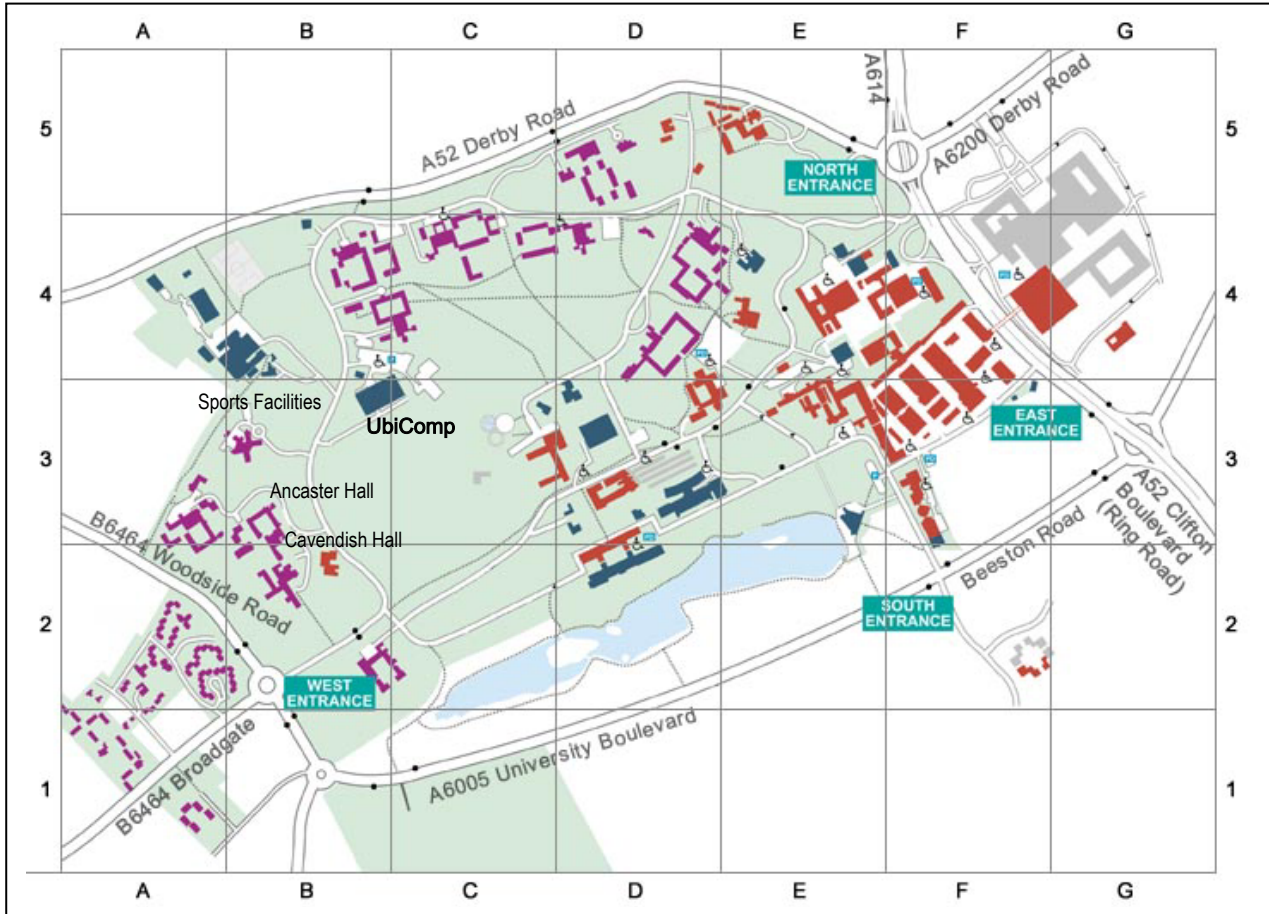
DG Cars - 0115 960 7607

Fleet - 0115 911 2233

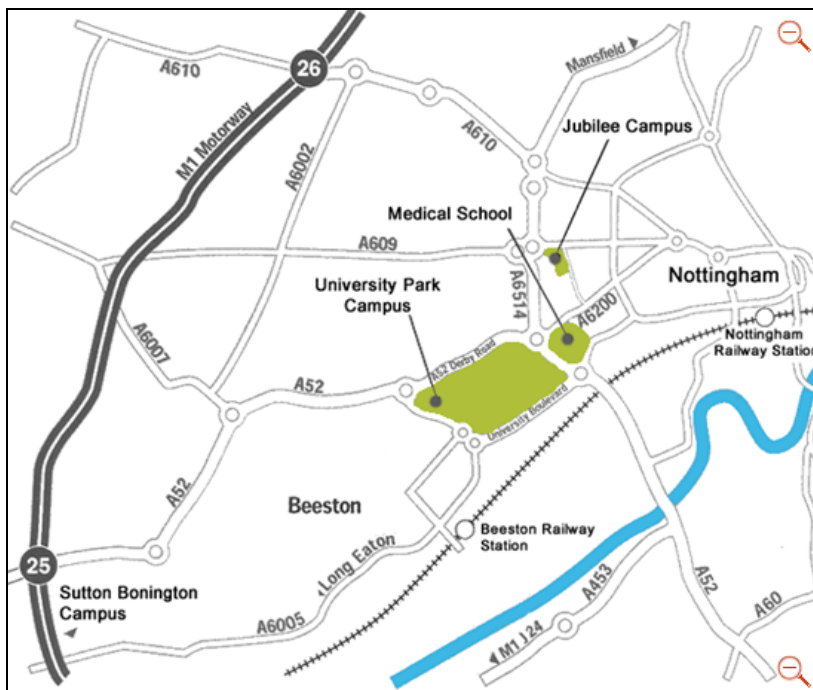
# Conference Information

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## Map of University Park



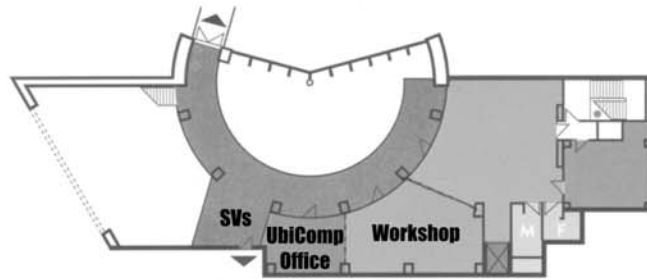
## University Park and the surrounding area



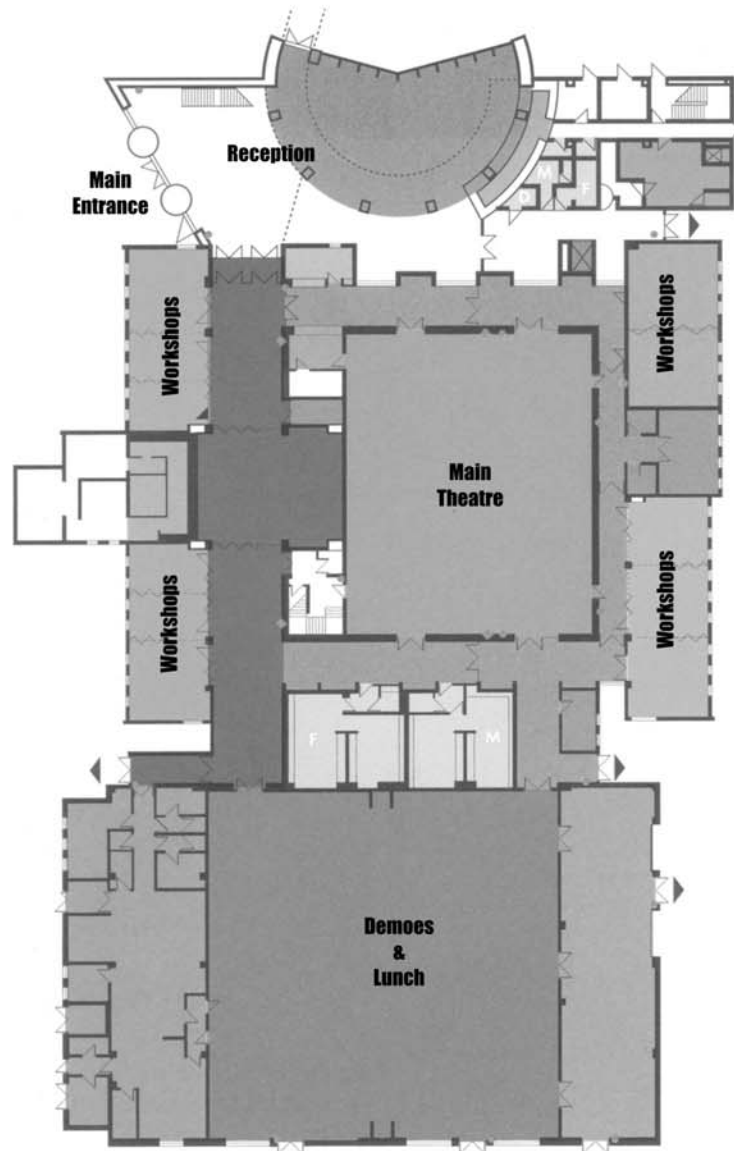
**Conference Centre Layout**

**Tuesday 7 September**

**First Floor**



**Ground Floor**

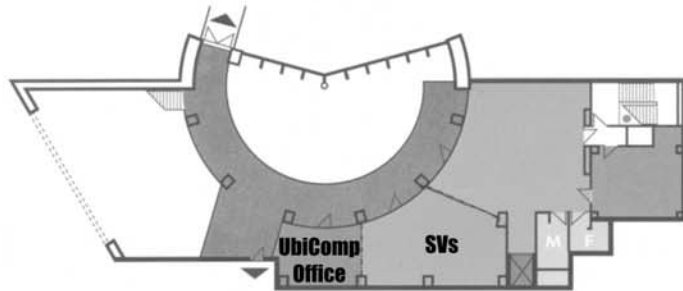


# Conference Information

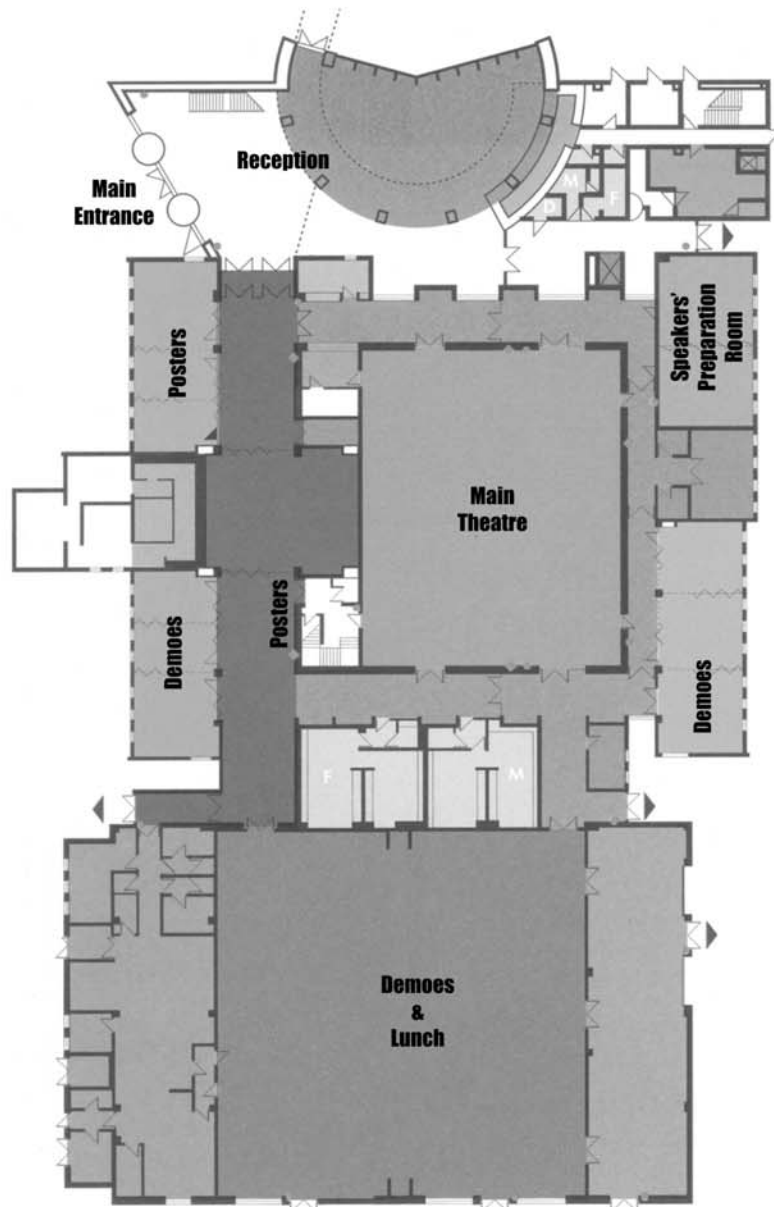
(continued)

## Wednesday 8 September - Friday 10 September

### First Floor



### Ground Floor



# Committees

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(University of Nottingham, UK)

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Nigel Davies  
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Elizabeth Mynatt  
(Georgia Institute of Technology, USA)  
Itiro Siio  
(Tamagawa University, Japan)

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### Posters Chair

James Scott  
(Intel Research, Cambridge, UK)

### Videos Chair

Michael Beigl  
(TecO, University of Karlsruhe, Germany)

### Doctoral Colloquium Chair

Gregory Abowd  
(Georgia Institute of Technology, USA)

### Workshops Chair

Mike Fraser  
(University of Bristol, UK)

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## **Notes**

