

Second International Conference on Pervasive Computing April 18-23, Linz / Vienna, Austria

### 14:00 – 15:30 Hot Spot & Video Sketches Chair: Lars Eric Holmquist (Viktoria Institute, Sweden)

#### **39 Hot Spot Papers**

Hot Spot Paper Chair: Alois Ferscha (University of Linz, Austria)

#### **9 Video Papers**

Video Chair: Horst Hörtner (AEC Future Lab, Austria)



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## HO1 Hot Spot Paper

### Microservices: A Lightweight Web Service Infrastructure for Mobile Devices

Nicholas Nicoloudis, I Made (Dennis) Pratistha,

#### Microservices: A Lightweight Web Service Infrastructure for Mobile Devices

## H01



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### **Hot Spot Paper**

### A Ubiquitous System for Medication Monitoring

Kenneth P. Fishkin<sup>1</sup>, Min Wang<sup>2</sup>, Gaetano Borriello<sup>1,3</sup>,

<sup>1</sup>Intel Research Seattle. Kenneth.p.fishkin@intel.com <sup>2</sup>University of Washington EE. mwang@ee.washington.edu <sup>3</sup>University of Washington CSE. gaetano@cs.washington.edu

### A Ubiquitous System for Medication Monitoring



- •Can we monitor medication monitoring?
- •Nobody has done a user study
- •User study reveals, among other things, that few people use medicine cabinets: many locations are used
- •Built 2 plug-and-play devices
- •RFID + digital scale measures pills taken from bottles
- •Enhanced blister pak measures pills taken from blister pak
- •We tested it 95 to 100% accuracy







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### **Hot Spot Paper**

### Context Aware Application of Semantic Web in Personified Home

Xuhui Chen, Yimin Wang, Yibin Hou

### Context Aware Application of H03 Semantic Web in Personified Home



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## H04

### **Hot Spot Paper**

### A Bayesian Approach for Dealing with Uncertain Contexts

Tao Gu<sup>1,2</sup>, Hung Keng Pung<sup>1</sup>, Da Qing Zhang<sup>2</sup>

<sup>1</sup>Department of Computer Science, National University of Singapore, Singapore <sup>2</sup>Institute for Infocomm Research, Singapore

### A Bayesian Approach for Dealing with Uncertain Contexts H04

 In this paper, we propose a probability extension to our ontology-based model for representing uncertain contexts; and use Bayesian networks to reason about uncertainty.

-Extextend the basic context model by incorporating probabilistic information,

Prob(Predicate(subject, value)

-To encode probability into a context ontology, we define two OWL classes: "*PriorProb*" and "*CondProb*".





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### **Hot Spot Paper**

### Targeted Sound Distribution with Embedded IP Based Loudspeaker Devices

Philipp Hünerberg<sup>1</sup>, Peter Gober<sup>1</sup>

<sup>1</sup>Competence Center for Advanced Network Technologies and Systems, Fraunhofer Institute for Open Communication Systems Berlin, Germany

### Targeted Sound Distribution with H05 Embedded IP Based Devices

•Using Internet-Protocol based microphone and loudspeaker devices as components of a public address system allows to realize more targeted and personalized messages. A hardand software design has been implemented to demonstrate the benefits of such a system.





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### **Hot Spot Paper**

### Spoken Interaction in Intelligent Environments: A Working System

Germán Montoro, Xavier Alamán, Pablo A. Haya

Escuela Politécnica Superior Universidad Autónoma de Madrid Spain

### Spoken Interaction in Intelligent H06 Environments: A Working System

Intelligent environments are ubiquitous computing systems that react to and interact with their inhabitants. This is a real intelligent environment that supports spoken interaction with its users. The spoken dialogue interface is automatically created according to the environment and the interpretation and generation vary depending on the physical environment context.







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## HO7 Hot Spot Paper

### Performance Evaluation Simulation System for MANET Routing Protocols For E-Commerce Hot Spots

Khaled E. A. Negm & Wael Adi

Etisalat University, UAE

### Performance Evaluation Simulation System for MANET Routing Protocols For E-Commerce Hot Spots

•What? proposing of the most suitable RP/ MOB\_C ! their speeds and then changing (handover) from one AP to another

- •How? By building a Sim. Sys. for testing and/or enhanced "new proposed routing algorithm". NON is currently suitable
- What is New? Enhancing the K-hop CB-DSR Algorithm by "a 2ndry BdC by which the routing matrix will accommodate the high speed of the client and handover services.
- •Results: Reduce errors by at least 27%, traffic increase 15%

•Implementation: done within our systems and implemented on the 802.11 MAC layer.

•What is next: add more routing algorithms, Provide the routing client part within the 802.1x authentication service, have it running on Pocket PCs, Implement fast moving scenarios for the new protocols



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### **Hot Spot Paper**

### A New Approach to Distributed Context-Aware Computing

Paul Swoboda, John Plaice

School of Computer Science and Engineering The University of New South Wales Sydney, Australia

### A New Approach to Distributed Context-Aware Computing

The Intense Project provides a networked run-time system allowing multiple participants to manipulate a shared treestructured context.

H08





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### **Hot Spot Paper**

### Towards Situation-Aware Affordances: An Experimental Study

Stavros Antifakos, Florian Michahelles, Bernt Schiele

Perceptual Computing and Computer Vision Group ETH Zurich, Switzerland We enhance physical objects to improve interaction, by:

- using sensors to perceive the users actions
- using LED's to present small amounts of information

**Prototype:** Flat-pack furniture extended with sensors and LED's to present instructions.

**User study** shows a measurable **time gain** using LED's compared to classic paper-based instructions.



H09

first step towards **just-in-time**, **situation-aware** information presentation



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### **Hot Spot Paper**

### Is TV a Suitable Device for Smart Home Applications?

Martin Maguire<sup>1</sup>

<sup>1</sup>ESRI, Loughborough University, Holywell Building, Holywell Way, Loughborough, LE11 3UZ, UK. *m.c.maguire@lboro.ac.uk* 

# A study conducted with older users

Interviews were carried out with 17 subjects between the ages of 47 and 79 to discuss the concept of a home system and to obtain their response to the idea of TV as a home control device, compared to a PC.

In general a TV was preferred for the following reasons:

- Lack of room to install a PC
- PC thought to go out of date quicker
- Tired of using a PC at work
- More comfortable using a TV in lean back mode.
- Would allow person to surf while someone else uses home computer
- TV could become an elegant device that does everything in the home

In a previous study, it was found that ITV was preferred to a PC for 2 tasks (home shopping and banking) due its simplicity, novelty and more limited options

The next step is to define conventions of user interface design for TV interaction at home and explore the suitability of different applications for TV control.



## H10



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## H11

### **Hot Spot Paper**

### Adaptive, Planning Based, Web Service Composition for Context Awareness

Maja Vukovic, Peter Robinson

Computer Laboratory, University of Cambridge

### Adaptive, Planning Based, Web Service Composition

# H11





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### **Hot Spot Paper**

### **Collaborative Capturing and Interpretation of Experiences**

Yasuyuki Sumi<sup>1,2</sup>, Sadanori Ito<sup>2</sup>, Tetsuya Matsuguchi<sup>3</sup>, Sidney Fels<sup>4</sup>, Kenji Mase<sup>5,2</sup>

<sup>1</sup>Graduate School of Informatics, Kyoto University
<sup>2</sup>ATR Media Information Science Laboratories
<sup>3</sup>University of California, San Francisco
<sup>4</sup>The University of British Columbia
<sup>5</sup>Information Technology Center, Nagoya University

### Collaborative Capturing and H12 Interpretation of Experiences





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### **Hot Spot Paper**

### An IP-based Bluetooth Multi-hop Network for Inhouse Communication

Markus Augel, Wolfgang Arne Heidrich, Rudi Knorr

Fraunhofer Institute for Communication Systems, Munich, Germany

### An IP-based Bluetooth Multi-hop Network H 13 for Inhouse Communication

- Communication infrastructure for mobile Bluetooth devices
- Completely wireless
- Dedicated infrastructure elements
- Two Bluetooth modules for enhanced throughput
- No configuration, no administration
- Automatic network formation, routing and handover
- Conforming to the Bluetooth specification
- Realized as prototype



Bluetooth infrastructure element prototype



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## H14

### **Hot Spot Paper**

### Using Camera-Equipped Mobile Phones for Interacting with Real-World Objects

Michael Rohs, Beat Gfeller

Institute for Pervasive Computing, Department of Computer Science, Swiss Federal Institute of Technology (ETH) Zurich

### Visual Code Recognition for H14 Camera-Equipped Mobile Phones





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## **Hot Spot Paper**

### A Visual Marker Using Computer Displays For Real Space Applications

Yasue Kishino<sup>1</sup>, Masahiko Tsukamoto<sup>1</sup>, Yutaka Sakane<sup>2</sup>, Shojiro Nishio<sup>1</sup>

<sup>1</sup>Graduate School of Information Science and Technology, Osaka University, Japan <sup>2</sup>Faculty of Information, Shizuoka University, Japan

### A Visual Marker Using Computer Displays For Real Space Applications



• A marker is presented on a computer display to transmit short information by changing color pattern.

• A receiver gets information and location by capturing an image including the marker.

Applications: AR, 3D navigation, outdoor learning



A difference image on image processing

Overlaying a virtual object on an image





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### **Hot Spot Paper**

### Talking Assistant: A Smart Digital Identity for Ubiquitous Computing

Erwin Aitenbichler, Jussi Kangasharju, Max Mühlhäuser

Telecooperation Group, Department of Computer Science, Darmstadt University of Technology, Germany

# Talking AssistantH16A Smart Digital Identity for UC





- MUNDO Architecture
  - Network of appliances and services
  - Minimal Entity (ME) in the center
- ME features
  - Digital Identity
  - Interaction
  - Context-Awareness
  - Networking



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## H17

### **Hot Spot Paper**

### **Fundamentals of Ubiquitous Tracking**

Martin Wagner, Asa MacWilliams, Martin Bauer, Gudrun Klinker Institut für Informatik, Technische Universität München

Joseph Newman, Thomas Pintaric, Dieter Schmalstieg VR Group, Vienna University of Technology

### Fundamentals of Ubiquitous Tracking

H17

- Heterogeneous location sensors (mobile and stationary) in UbiComp environments enable new application areas (e.g. ubiquitous AR)
- Formal framework to model sensor networks

- **Powerful:** Existing setups can be modelled easily
- **Extensible:** Sensors, filters and optimisation criteria can be added at runtime
- **Efficient:** Distributed, highfrequency, low-latency implementation possible







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### **Hot Spot Paper**

# The concepts of an end-user enabling architecture for ubiquitous computing

Achilles Kameas<sup>1</sup>, Irene Mavrommati<sup>2</sup>

DAISy Group, Research Academic Computer Technology Institute, Patras, Greece, <u>http://daisy.cti.gr</u> <sup>1</sup>Hellenic Open University, <sup>2</sup>University of the Aegean {kameas, mavrommati}@cti.gr
# The concepts of an end-user enabling architecture for ubiquitous computing

# H18



In Gadgetware Architectural Style (GAS) an appropriate vocabulary acts as common referent. The eGadgets capabilities (Plugs) can be inter-associated with invisible links (Synapses) to form ubicomp applications. Editors are applications for end users that support the establishment of ubicomp applications

synapse plug GAS-OS Middleware High-level OS High-level OS Gadget OS Gadget OS Gadget OS Gadget OS Gadget OS Gadget OS Jeve Virtual Machine (JVM) Urrifer Use Use FOGARIC Sensors / actuators



Plug Synapse MODEL: conceptual model for peer to peer computing, independent of underlying protocols. GAS-OS, EDITORS, ONTOLOGY, MODEL are all part of GAS, a framework that provides appropriate vocabulary, configuration rules and semantic interpretation.



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## **Hot Spot Paper**

#### A Mountaineering Supporting System

Yukimune Kuroki, Sachiyo Yoshitaki, Yutaka sakane, Yoichi Takebayashi

Shizuoka University

### A Mountaineering Supporting System

# H19

#### Goal

The aim of our research is to realize a mountaineering supporting system. The system understands climbers' condition and environmental circumstance, and provide proper know-how and knowledge.

#### Approach: 3ways to support mountaineering

[Before climbing] : view contents, confirm necessary knowledge

- Map out a route
- Necessary equipments
- Mountain-specific knowledge

[In climbing] : collect bodily and environmental information, support safety climbing

- Body's tilt : acceleration sensor on shoulder
- Walking rhythm : acceleration sensor on waist
- Vital warmth and temperature : temperature sensor
- Position : GPS

#### [After climbing] : making contents from data on terrain, environments and bodie

- Mapping the points on a map with the data on the changes of walking rhythm
- Learn how to predict the change of the weather, how to decide to return and how to rescue the injured in emergencies
- Use accumulated contents as materials for next climbing

We consider a concrete supporting system by implementing wearable sensing devices in experimental climbing in order to get bodily information.



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# HOT Spot Paper

#### Making Use of Serendipity: A New Direction of Pervasive Computing from a Sociological View

James Chao-Ming Teng, Hao-hua Chu, Jane Yun-jen Hsu

Department of Computer Science and Information Engineering National Taiwan University, Taipei, Taiwan 106 {jt, hchu, yjhsu}@csie.ntu.edu.tw

#### Making Use of Serendipity: H20 Pervasive Social Interaction



We care about interactions between:

The <u>Ad-hoc networks</u> (serendipitous links) and

The Social networks (existing links)



Based on theories in <u>interpersonal</u> <u>communication</u> and <u>social</u> <u>psychology</u>, we identified what roles that pervasive computing can come into play for "pervasive social interaction"



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# H21

### **Hot Spot Paper**

#### **Pervasive Computing and Proactive Agriculture**

#### Richard Beckwith<sup>1</sup>, Dan Teibel<sup>1</sup>, and Pat Bowen<sup>2</sup>

<sup>1</sup>People and Practices Research, Intel Research <sup>2</sup>Pacific Agri-Food Research Centre, AgCanada

### Pervasive Computing and Proactive Agriculture





•Using a 65-node wireless sensor network, we have discovered agriculturally significant variation within a 1 hectare (approx. 2 acre) region of vineyard that had been considered a single management block.





Growing Degree Days (fruit ripening)



Minimum Temperature (crop choice)



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# H22

## **Hot Spot Paper**

#### Laser Pointers as Interaction Devices for Collaborative Pervasive Computing



Andriy Pavlovych, Wolfgang Stuerzlinger

Department of Computer Science York University Toronto, Ontario, Canada

## Laser Pointers as Interaction Devices in Collaborative Interfaces H22



- •Use multiple cameras to find laser spots
- Wireless transmission of button press
- •Devices useable for interaction with:
  - images on the wall, interactive whiteboards
  - appliances (light switch, blinds, DVD...)
  - home entertainment devices
- •New features:
  - dynamic allocation of device
  - eye safety





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# H23

## **Hot Spot Paper**

#### Context-Aware Queries Using Query By Browsing and Chiromancer

Stavros Polyviou, Paraskevas Evripidou, George Samaras

Department of Computer Science, University of Cyprus

#### Context-Aware Queries Using Query H23 By Browsing and Chiromancer

Query by Browsing (QBB) is a relationally complete VQL
Chiromancer is an implementation of QBB on the Palm PDA
By describing context using a relational schema, mobile users can use Chiromancer to construct context-aware queries





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# H24

## **Hot Spot Paper**

#### A Mixed Reality based Training Application for an Oil Refinery

Werner Hartmann<sup>1</sup>, Michael Haller<sup>2</sup>, Jürgen Zauner<sup>2</sup>

<sup>1</sup>Institut für Anwendungsorientierte Wissensverarbeitung (FAW), Johannes Kepler Universität Linz <sup>2</sup>Fachhochschule Hagenberg, Medientechnik und -design

### A Mixed Reality based Training H24 Application for an Oil Refinery

- Application benefits
  - easier learning of the production process
  - navigation by video
  - context sensitive information
- Implementation
  - Authoring instead of programming
  - Component based framework
  - Easy to use visual authoring tool
  - www.amire.net





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## **Hot Spot Paper**

#### **Occlusion Detection for Front-Projected Interactive Displays**

Maria Nadia Hilario and Jeremy R. Cooperstock

Centre for Intelligent Machines, McGill University

## Occlusion Detection for Front-Projected Interactive Displays H25





- Front projection for interactive ubiquitous displays
- Occlusion problem:
  - distortions in projected image
  - shadows
- Occlusion detection for:
  - shadow removal
  - occluder light suppression
  - *painting* on users
- Based on camera-projector calibration:
  - compare predicted and observed camera images







observed camera image



detected occlusions



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# H26

## **Hot Spot Paper**

#### Context-aware Computing Using a Shared Contextual Information Service

<sup>1</sup>Nancy Miller, <sup>1</sup>Glenn Judd, <sup>1</sup>Urs Hengartner, <sup>1</sup>Fabien Gandon, <sup>1</sup>Peter Steenkiste, <sup>2</sup>I-Heng Meng, <sup>2</sup>Ming-Whei Feng, <sup>1</sup>Norman Sadeh

> <sup>1</sup>School of Computer Science, Carnegie Mellon University, USA <sup>2</sup>Institute for Information Industry, Taiwan

#### Context-Aware Computing Using a H26 Shared Contextual Information Service





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H27

## Hot Spot Paper

#### A Design of the Ubiquitous Karate School for Learning Mind and Body Interaction

Yutaka Sakane, Masami Takahata, Naofumi Ohtani, Yukimune Kuroki, Yoichi Takebayashi

Shizuoka University

# H27

**GOAL:** to design a **profound karate learning environment** in which all learners can find next steps for making progress.

We have to know karate and express it as a data model on the computer.

Basic skills (waza), Forms (kata)

timing, breath, shout, shape, power, ...

Sparrings (kumite)

distance, rhythm, feint, situation, emotion, ...

#### Lots of challenges are in this area!!

We gain experiences through actual training, consider a karate model, and implement some devices and a coaching system.



Sensor devices for karate



The ubiquitous karate school



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## **Hot Spot Paper**

#### **The Smart Box Application Model**

#### Matthias Lampe<sup>1</sup> and Christian Floerkemeier<sup>1</sup>

<sup>1</sup>Institute for Pervasive Computing, ETH Zurich, 8092 Zurich, Switzerland, {lampe,floerkem}@inf.ethz.ch

#### The Smart Box Application Model

# H28

#### Smart Box Applications





Smart Box application model and software framework provides reusable design, architecture and predefined software components to facilitate the development of future Smart Box applications.



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## **Hot Spot Paper**

#### A Computationally Enhanced Play Board for Group Interaction

Orit Shaer<sup>1,2</sup>, Babak Ziraknejad<sup>1</sup>, Ken Camarata<sup>1</sup>, Ellen Yi- Luen Do<sup>1</sup>, Mark D. Gross<sup>1</sup>

<sup>1</sup>Department of Computer Science, Georgia Institute of Technology <sup>2</sup>Instituto de Ciencias Matematicas e de Computacao, Universidade de Sao <sup>3</sup>Institut für Pervasive Computing, Johannes Kepler Universität Linz

### A Computationally Enhanced Play H29 Board for Group Interaction





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# **H30**

## **Hot Spot Paper**

#### The UbER-Badge - A Versatile Platform at the Juncture Between Wearable and Social Computing

Mathew Laibowitz, Joseph A Paradiso

Responsive Environments Group, MIT Media Lab Massachusetts Institute of Technology The UbER-Badge - A Versatile Platform at the Juncture Between Wearable and Social Computing



Applications include: •Viral Messaging •Social Networking •Multiplayer Games •Audience Participation •Locating a Person or Point of Interest •Equipped with peer-to-peer wireless network (100meters)

**H**30

- •IR communication
- •Audio In/Out
- •LED display (LCD option)
- Accelerometer, Light Sensor
- Vibratory Feedback





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# H31 Hot Spot Paper

## Improving the Reality Perception of Visually Impaired through Pervasive Computing

Vlad Coroama<sup>1</sup>, Tarik Kapic<sup>2</sup>, Felix Röthenbacher<sup>1</sup>

<sup>1</sup>Institute for Pervasive Computing, Swiss Federal Institute of Technology (ETH) Zürich, <sup>2</sup>Ecole Polytechnique Fédérale Lausanne (EPFL)

### Reveal the Surroundings to the Visually Impaired

# H31



Needs:

- Navigation
- •Getting a feel for the neighborhood
- Taking actions on real-world objects



The Chatty Environment components: Berkeley Motes, RFID tags, PDA, lightweight XML communication, TTS





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#### Creating Ad-Hoc Pervasive Computing Environments

Michael Beigl, Tobias Zimmer, Albert Krohn, Christian Decker, Philip Robinson University of Karlsruhe, Germany

#### **Creating Ad-Hoc Pervasive Computing Environments**

**V01** 



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#### **Context Aware Cell Phone Concept**

Urpo Tuomela<sup>1</sup>, Mika P. Mustonen<sup>1</sup> <sup>1</sup>Nokia Corporation, Oulu, Finland

#### Context Aware Cell Phone Concept

- In the paper and video we present a context aware cell phone concept, which is targeted for people working in office environment.
- User centric design (UCD) process was used in the concept work, which was carried out in a large project including:
  - User interaction designs with relevant end user tests
  - An industrial design prototype with S60 UI layouts
  - Technical solutions with working samples
- The main drivers for the user interface and prototype design obtained from end user needs were:
  - portability, compliance to working and movement, constant availability, quick access to basic applications and services, efficient and intuitive UI, context awareness and discreetness without forgetting fun
- The focus was on personal security and identity, suggesting automation, non-intrusive user interfaces and adjusting communication.



automation

**V02** 



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**Video Paper** 

#### **Service Mobility Proxy for Seamless Handover between Various Devices**

Mikio Hasegawa<sup>1</sup>, Udana Bandara<sup>1,2</sup>, Masugi Inoue<sup>1</sup>, Khaled Mahmud<sup>1</sup>, Hiroyuki Morikawa<sup>1,3</sup>

<sup>1</sup>Mobile Networking Group, National Institute of Information and Communications Technology <sup>2</sup>Graduate School of Information Science and Technology, University of Tokyo <sup>3</sup>Graduate School of Frontier Science, University of Tokyo





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# **V04**

**Video Paper** 

#### u-Photo: A Snapshot-based Interaction Technique for Ubiquitous Embedded Information

Naohiko Kohtake<sup>1 2</sup>, Takeshi Iwamoto<sup>1</sup>, Genta Suzuki<sup>1</sup>, Shun Aoki<sup>1</sup>, Daisuke Maruyama<sup>1</sup>, Takuya Kouda<sup>1</sup>, Kazunori Takshio<sup>1</sup>, Hideyuki Tokuda<sup>3</sup>

> <sup>1</sup>Graduate School of Media and Governance, Keio University <sup>2</sup>Japan Aerospace Exploration Agency <sup>3</sup>Faculty of Environmental Information, Keio University

# u-Photo: A Snapshot-based Interaction Technique V04 for Ubiquitous Embedded Information

#### Augmented Image which enables

- Intuitive Interaction
- Remote Operation
- Service Reproduction









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#### Urban Tapestries: Public Authoring in the Wireless City

Alice Angus, Giles Lane Proboscis, UK
#### Urban Tapestries: V05 Public Authoring in the Wireless City



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**Video Paper** 

#### Smart Roads in the Pervasive Computing Landscape

Volker Christian<sup>1</sup>, Alois Ferscha<sup>1</sup>, Wolfgang Narzt<sup>1</sup>, Gustav Pomberger<sup>1</sup>, Dieter Kolb<sup>2</sup>, Reiner Müller<sup>2</sup>, Jan Wieghardt<sup>2</sup>, Reinhold Bidner<sup>3</sup>, Horst Hörtner<sup>3</sup>, Christopher Lindinger<sup>3</sup>

<sup>1</sup>University of Linz, Austria, <sup>2</sup>Siemens AG Corporate Technology, Munich, Germany <sup>3</sup>Ars Electronica Futurelab Linz, Austria

# Smart Roads in the V06 Pervasive Computing Landscape

### **Smart Roads**

- virtually color the route
- display virtual cars for intuitive navigation
- show points of interest





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#### Spotlight Navigation: Interaction with a handheld projection device

Stefan Rapp, Georg Michelitsch, Martin Osen, Jason Williams, Martin Barbisch, Ronan Bohan, Zica Valsan, Martin Emele Sony Corporate Laboratories Europe

## Spotlight Navigation: Interaction with a handheld projection device

- New intuitive interaction paradigm for mobile devices
- Novel display architecture allowing wall size, high resolution display



V07



- Easy browsing by panning and zooming
- Moving spotlight over wall allows information to be viewed
- Information maintains location on wall while device moves
- Zooming in for more detailed information
- Natural input by writing and painting on the wall



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**Video Paper** 

#### **Investigating Prototypes Through Play**

Kristina Andersen<sup>1</sup>

<sup>1</sup>STEIM, studio for electro instrumental music, the Netherlands

#### Investigating Prototypes Through Play





Clothes are fitted with sensors that modifies sound to capture children's emerging understanding of electronic sensing.

... The position of a mans hat, the swoosh of a dress, the darkness of a ladies bag...

The children spontaneously explore and interpret the prototypes through play.





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#### **Digital Aura**

#### A. Ferscha<sup>1</sup>, M. Hechinger<sup>1</sup>, R. Mayrhofer<sup>1</sup> M. dos Santos Rocha<sup>2</sup>, M. Franz<sup>2</sup>, R. Oberhauser<sup>2</sup>

<sup>1</sup>Institut für Pervasive Computing, Johannes Kepler Universität Linz <sup>2</sup>Siemens Corporate Technology CT SE2, Munich, Germany

### **Digital Aura**

## V09







- individual-centric
- ad-hoc
- contextualized
- spatial proximity

approach:

- interest and preference profile (XML)
- proximity sensing (BT, IrDA, WiFi, ..)
- "en-passant" profile exchange
- profile matching / similarity analysis
- active / passive privacy control



Context A



Context B



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#### 15:30 – 16:00 Coffee Break