

# Technology in Place(s)

**Joe McCarthy**

**Intel Research Seattle**



Seattle, Washington

**UbiComp**

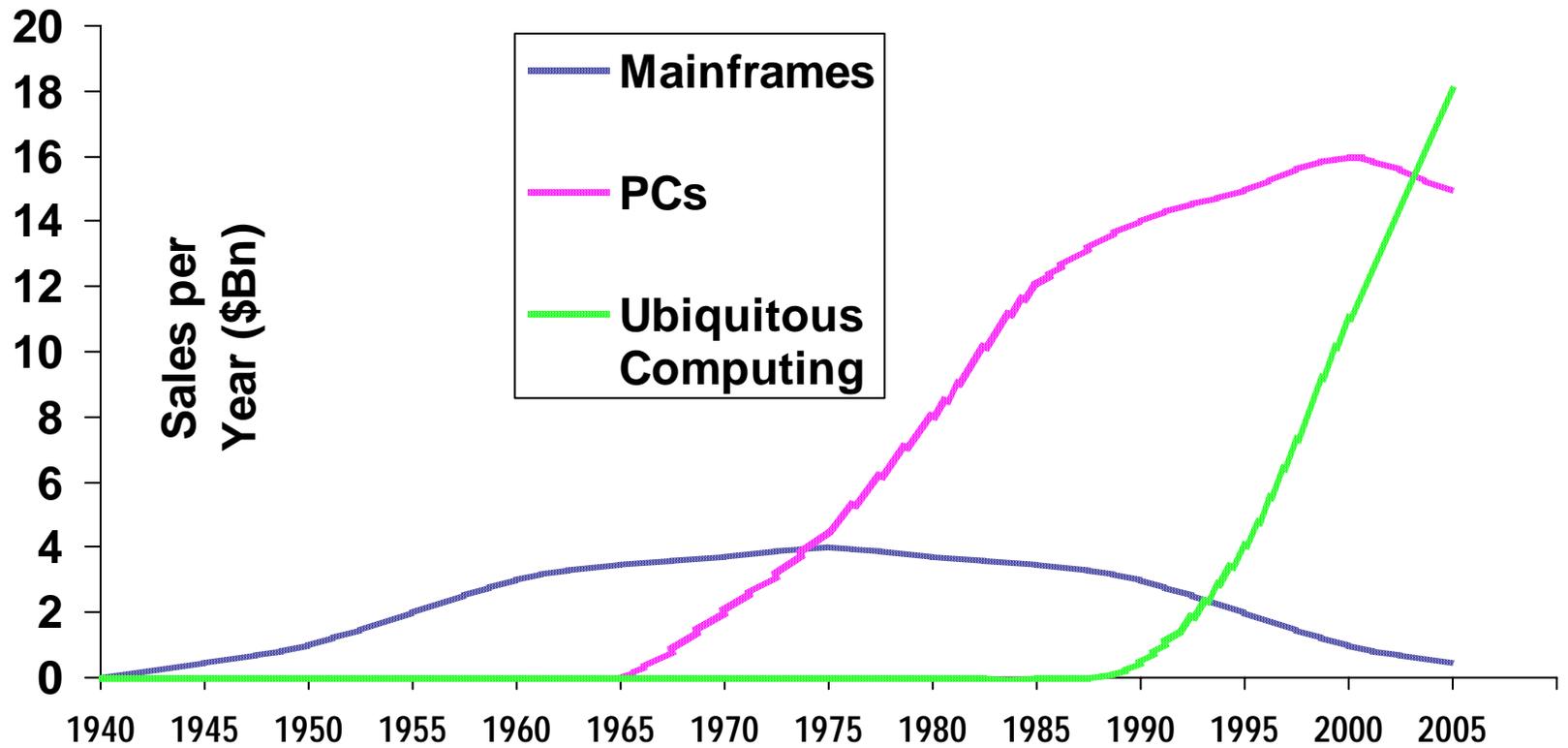
The Fifth International Conference on Ubiquitous Computing

October 12-15  
**2003**

# Outline

- Ubiquitous Computing
  - Brief (biased) review
- *Situated* Computing
  - Technology in Place(s)
- Proactive Displays
  - Past, current & future
- UbiComp 2003
  - Demonstrations

# Major Trends in Computing



# Major Trends in Computing *Places*

Out of the *closet*, ...



# Major Trends in Computing *Places*

Out of the *closet*, **beyond the *desktop***, ...



# Major Trends in Computing *Places*

Out of the *closet*, beyond the *desktop*, and into ...



# Major Trends in Computing *Places*

Out of the *closet*, beyond the *desktop*, and into ...



# Major Trends in Computing *Places*

Out of the *closet*, beyond the *desktop*, and into ...



# Grand Challenge: So what?

- UbiComp: technology in search of a problem?
  - New capabilities?
- *Situated Computing*
  - Location matters [again]
  - Inserting technology into new physical contexts
    - Where it can *add value* (!)



# Proactive Displays

- “Displays will be everywhere”
  - What will we do with them?
  - What will *they* do for *us*?
- How can displays *sense & respond* appropriately to the *people & activities* taking place nearby?
  - Context
  - Content
  - Interaction models



# Proactive Displays: the promise & peril

- The more we reveal about ourselves to
  - People, businesses, objects, locations, ...
- ... the better able they are to respond *appropriately* ...
  - Music, events, targeted advertising (?)
  - Injuries, pregnancies, other challenges
- ... or *inappropriately*
  - Privacy / benefit tradeoff

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## **MusicFX:** a Proactive *Auditory* Display

*Revelation:* musical preferences (while working out)

*Benefit:* influence music selection

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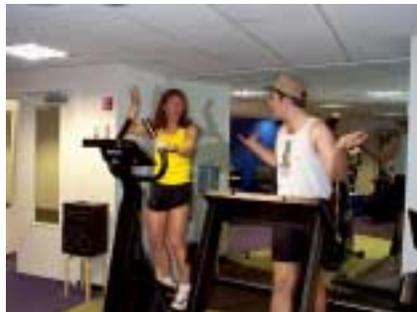
## GroupCast

*Revelation:* favorite web sites

*Benefit:* conversation opportunities,  
increased awareness

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# Proactive Displays



**Dangling String (PARC)**



**Bus Mobile (UC Berkeley)**

# Proactive Displays, circa 2001



Toyota "Pod" @ Tokyo Motor Show, October 2001

Orange = happy (owner approaching)

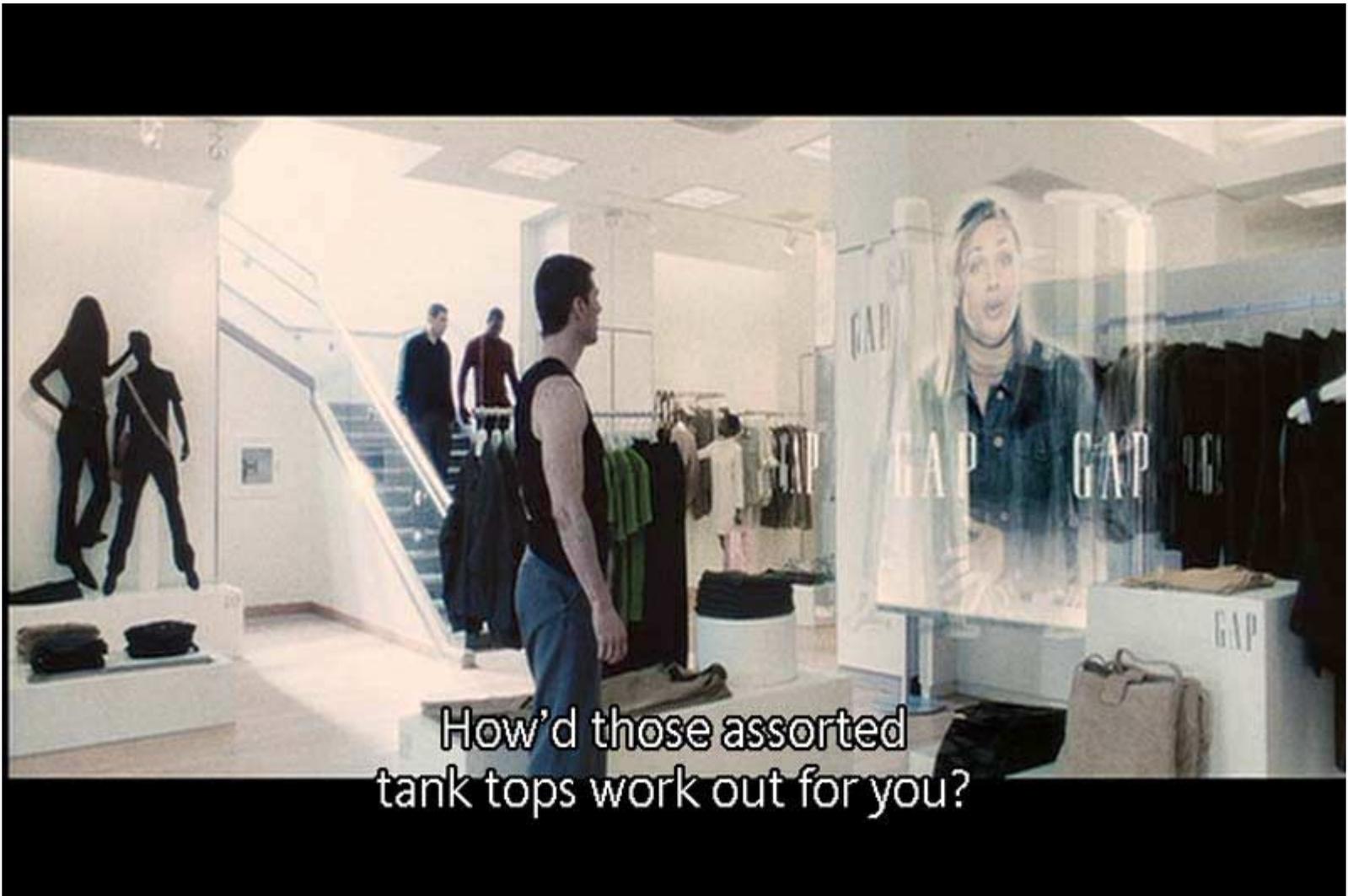
Blue = sad (low on fuel)

Red = anger (sharp braking)

# Proactive Displays, circa 2054



# Proactive Displays, circa 2054



# Proactive Displays in the Large



An interactive project for SIGGRAPH 97  
at Billboard Live on Sunset Boulevard

"Sunset"

Margaret Crane-Dale MacDonald-Scott Mirmiran-Jon Wines  
Xerox PARC Artists In Residence Program (AIR)

**Sunset @ 200MHz (PARC)**

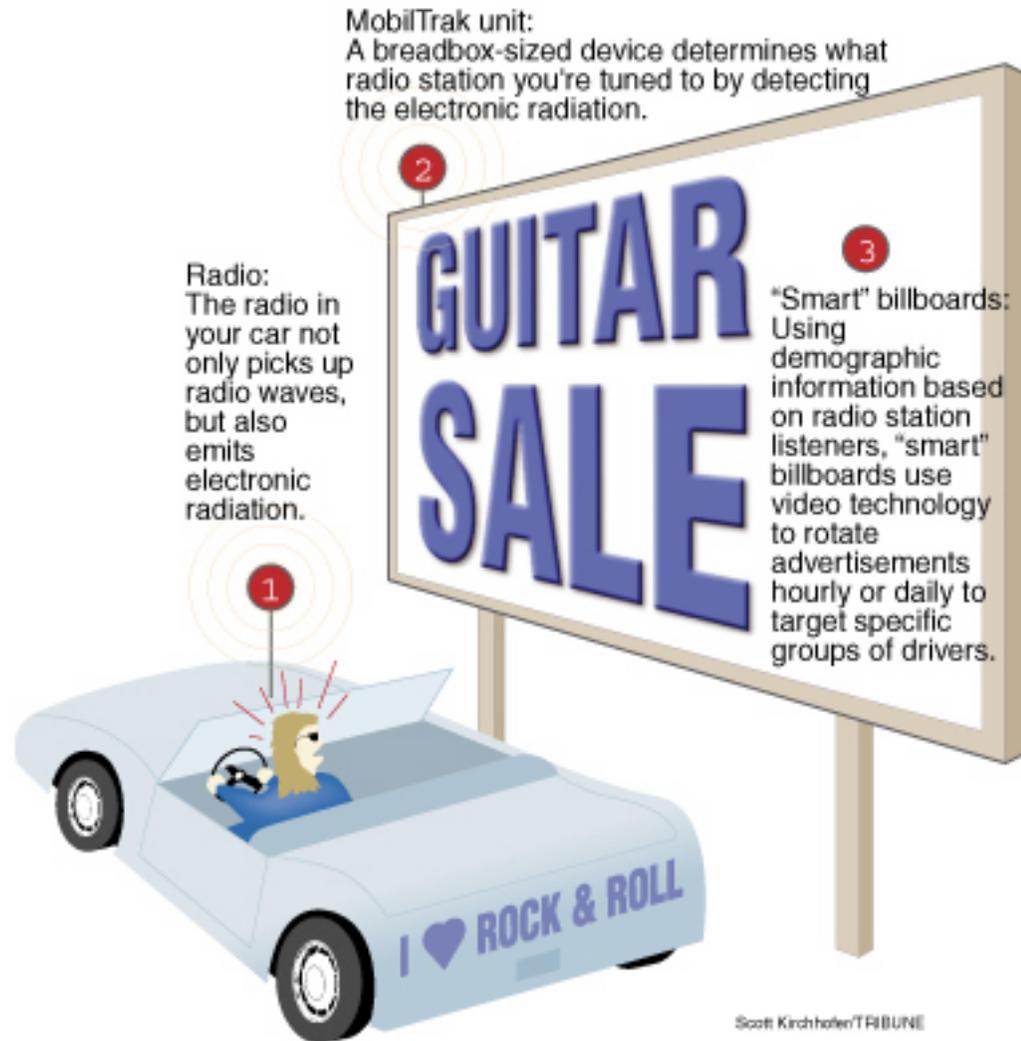


**Love Board (Hachiko Crossing)**

# Proactive Displays in the Large



Alaris E-boards  
([www.alaris.net](http://www.alaris.net))



# Pint-sized Proactive Displays

- Convergence of Motes & Displays
  - Mote processor + radio + LCD
  - Ultra low power
  - Future: bi-stable, color, reflective displays



# Experience UbiComp Project

- Why focus on conferences (e.g., UbiComp)?
  - Restricted context(s)
    - Paper/Poster/Demo sessions, Breaks, Lunch, Reception
  - Content is available
    - Registration info (badges), homepages
  - Desire to reveal details about yourself
    - Show & tell, learn about others & their work

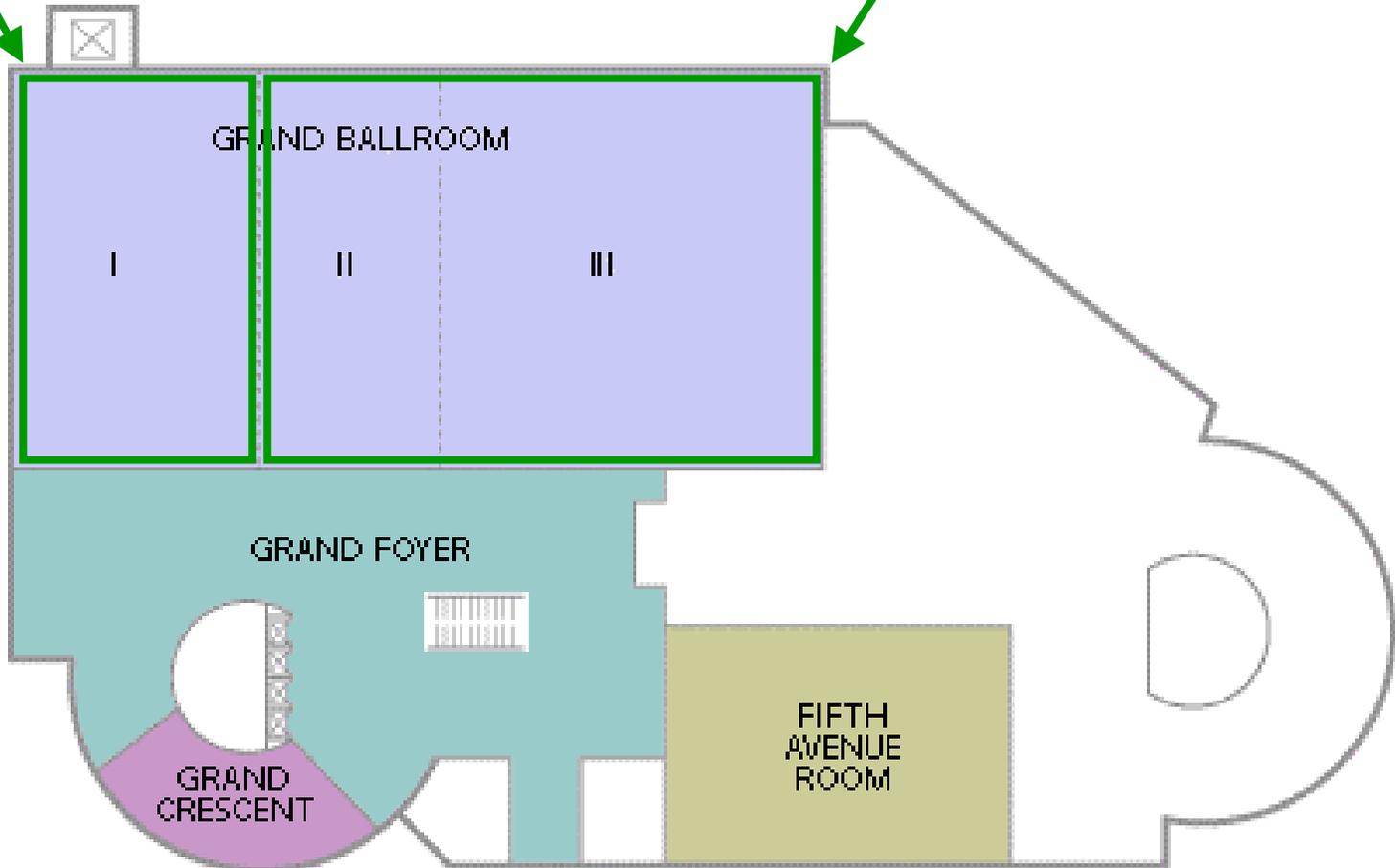


# Westin Seattle

Papers, Panel, Keynote

Posters, Demos, Internet, Coffee

Grand Ballroom Level



**October 12-15**  
**2003**

The Fifth International Conference on Ubiquitous Computing

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## Welcome!

UbiComp 2003, the Fifth Annual Conference on Ubiquitous Computing, is the premier forum for presentation of research results in all areas relating to the design, implementation, application and evaluation of ubiquitous computing technologies. It will bring together leading researchers from a variety of disciplines exploring the computing as it moves beyond the desktop and becomes increasingly interwoven into the fabrics of our lives.

UbiComp 2003 will take place October 12-15, 2003 in Seattle, Washington, the "Emerald City" of the Pacific Northwest. Seattle lies west of the volcanic peaks of the Cascade Range before the jagged Olympic mountains, nestled between Puget Sound and beautiful Lake Washington. There are many exciting and interesting sites to explore in this jewel of the Northwest, which offers plenty of innovations in music, film, theater, and food.

UbiComp 2003 welcomes a variety of submissions, including Full Papers, [shorter] Technical Notes, Demonstrations, Interactive Posters, Videos, Workshops, Panels and Invited Talks. Full information on each venue can be found in the [Call For Participation](#) on this site.

# Community Directory

## Sign in

You are signed in as **Joe McCarthy**. (If that's not you, [click here](#).)

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[Change your info.](#)

You can view UbiComp.org profiles alphabetically [by last name](#) or [by country](#).

## People who joined recently

[Harv Peters](#), Southern Alberta Institute of Technology

[Martin Jonsson](#), Stockholm University/KTH

[Bae, Seok-Hee](#), Government Research Officer

[Søren Lauritsen](#)

[Dario Bottazzi](#), DEIS - University of Bologna

[Carlos Villavieja](#)

[Neville Tencer](#), Sonic Mobility Inc

[Yoichi Takebayashi](#), Toshiba

[Spyros Lalis](#), ICS-FORTH



[Yvonne Rogers](#)  
Sussex University

## A random selection of members

If you provided a picture for your profile, it may show up in our random selection. You can [click here](#) to see a different selection.



[John Barton](#)  
HP Labs



[David W. McDonald](#)  
University of Washington



[Gregory Abowd](#)  
Georgia Institute of Technology



[Joe McCarthy](#)  
Intel Research, Seattle

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**Joe McCarthy**

*UbiComp 2003 General Chair, Researcher*  
Intel Research, Seattle  
USA  
[mccarthy@intel-research.net](mailto:mccarthy@intel-research.net)

**Involvement in UbiComp:** I have attended every HUC and UbiComp conference, starting in 1999. As General Chair this year, my goal is to use the conference as an opportunity to *experience* ubiquitous computing, in addition to talking about it, and I hope to involve as many people in this undertaking as possible.

**Interests:** Broadly speaking, I am interested in CSCW and Ubiquitous Computing. More specifically, my research involves the insertion of technology into physical spaces that can help create, maintain or enhance relationships and interactions among people; examples include [MusicFX](#), [ActiveMap](#) and [GroupCast](#).

**For more information:** <http://seattleweb.intel-research.net/people/mccarthy/>.

# Props



**UbiComp 2003**  
The Fifth International Conference on Ubiquitous Computing  
Seattle, Washington

**October 12-15**

## Proactive Displays -- Create Profile

Please provide information about yourself that you would like to share with other UbiComp 2003 attendees at the proactive display installations at the UbiComp 2003 conference. All of the **bold fields** are mandatory, please do not leave them blank. You can use the email links below to send us any content that is not currently available on a web site.

Please be sure to specify a **correct email address**. We will send the password for your proactive display profile to that email address. Please [contact us](#) if you do not receive your password within twenty-four hours.

Thanks for your willingness to participate!

**E-mail Address:**   
(e.g., jane.doe@unat.com)

**Full Name:**   
(e.g., Jane Doe)

**Affiliation:**   
(e.g., University of Washington)

Homepage URL:

Photo URL:    
Show a JPEG/JPG photo of yourself

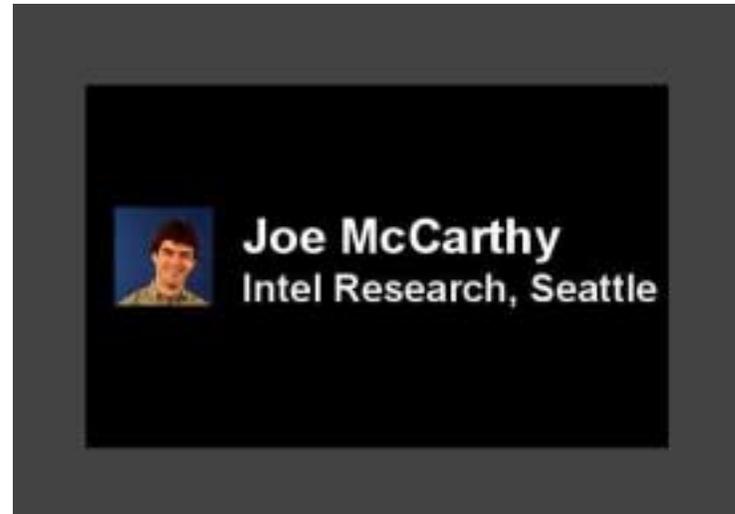
Ticket-To-Talk URL:    
Show a JPEG/JPG image of something you'd be happy to talk about with other Country Fair attendees.  
Click [here](#) for more information on "tickets to talk".

Ticket-To-Talk  
Caption:



# AutoSpeakerID

- Keynote/Paper/Panel Q&A “augmentation”
  - RFID: antenna (microphone), tag (badge)
  - Display photo, name, affiliation
  - Small (?) augmentation of common practice



# Ticket2Talk

- Coffee Break
  - *Explicitly* provided content
  - *Single* person (at a time)



**David H Nguyen**  
Georgia Tech  
Kitesurfing, anyone?



David H. Nguyen, A. Srinivasan, S. Chong, S. Chong

**Joe McCarthy**  
Intel Research, Seattle  
Proactive Displays



Joe McCarthy, S. Chong, David H. Nguyen, A. Srinivasan

**Al Mamunur Rashid**  
University of Minnesota  
Intel Research



A. Srinivasan, S. Chong, David H. Nguyen, Joe McCarthy

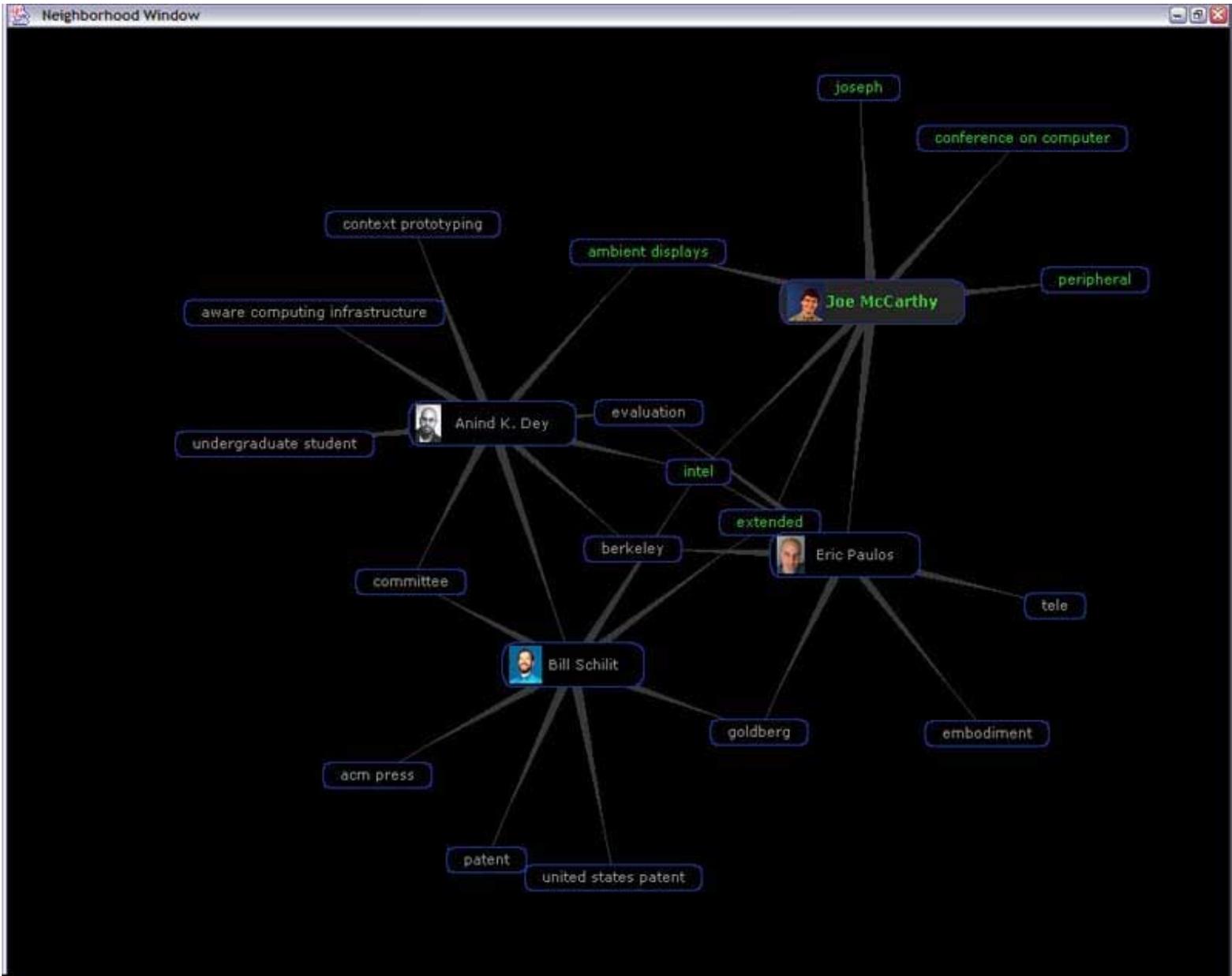
**Suzanne Soroczak**  
University of Washington  
Experience UbiComp Project



S. Chong, A. Srinivasan, David H. Nguyen, Joe McCarthy

# Neighborhood Window

- Demonstrations & Poster Session
  - *Implicit* content (mined from homepages)
  - *Groups* of people (& their words / phrases)



# Technology in Place (& Time):



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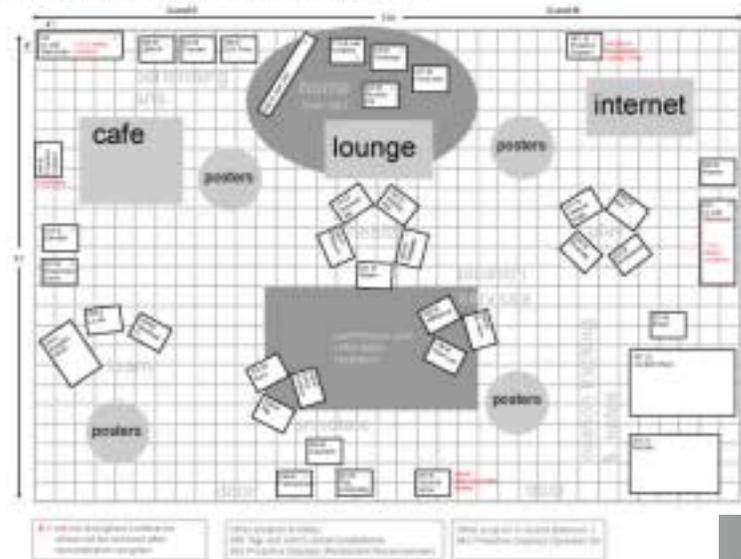
Seattle, Washington

<http://ubicomp.org>



**Westin Seattle**

UbiComp demonstrations layout for main exhibition space only



**Demonstrations**





# Ambient Wood



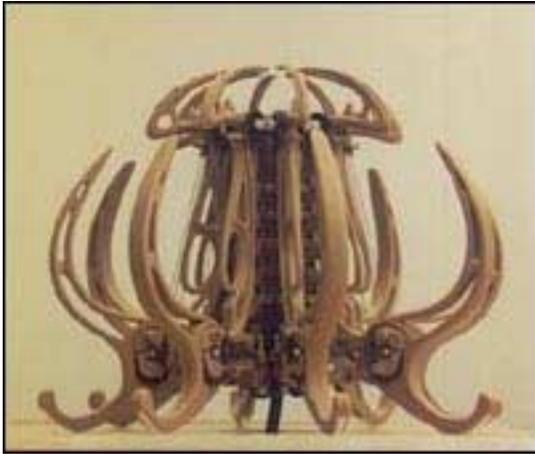
- **Ambient Wood: Demonstration of a Digitally Enhanced Field Trip for Schoolchildren**
- Cliff Randell<sup>1</sup>, Ted Phelps<sup>2</sup>, Yvonne Rogers<sup>2</sup>  
*<sup>1</sup>Department of Computer Science, University of Bristol, <sup>2</sup>School of Cognitive and Computer Science, University of Sussex*
- If you go down to the woods today ... you may find probing devices, PDAs and a WiFi network to help you understand the ecology of the woodland. This playful learning experience was designed to aid interactive exploration in a natural setting as part of the UK Equator Interdisciplinary Research Collaboration. The Ambient Wood project provided a range of innovative devices and a wireless infrastructure for groups of schoolchildren in Sussex, England, and is being recreated for conference attendees. In this demonstration it will be possible to collect and listen to imaginative sounds representing, for instance, photosynthesis and plant respiration; to probe and automatically log environmental conditions; and use the WiFi network to interact using virtual cards and sounds.

# Digital Elevator Poetry



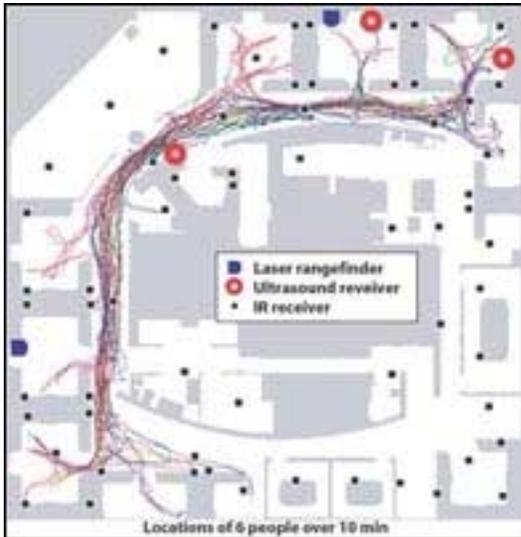
- **Digital Elevator Poetry**
- James G. Robinson  
*Interactive Telecommunications Program, New York University*
- The social awkwardness that pervades elevators is evident to anyone who has ever shared a ride with an unfamiliar person. The Digital Elevator Poetry project is a system of digital word modules, based on the popular phenomenon of refrigerator magnet poetry, that lessen this discomfort by providing a subtle means of interactive play.

# Living Sculpture



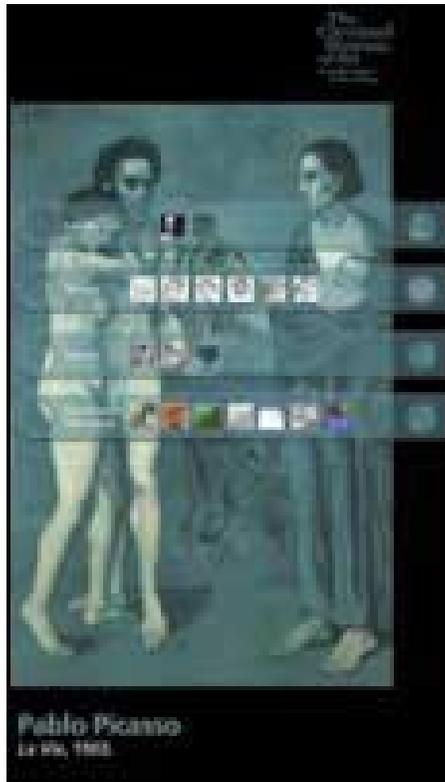
- **Living Sculpture**
- Yves Amu Klein and Michael Hudson  
*Lorax Works*
- Living Sculpture represents a series of works that attempts to bring emotional intelligence and awareness to sculptured life forms. Octofungi is an interactive sculpture that exhibits simple reflexive autonomous behavior, learns its surroundings, and interacts with them. It is sensitive to changes in light. To interact with the sculpture, a person only needs to move his hands above the light sensors. Depending on the “aggressiveness” or the “gentleness” of the participant, Octofungi will manifest different behaviors.

# Location Stack



- **The Location Stack: Multi-sensor Fusion in Action**
- Jeffrey Hightower and Gaetano Borriello  
*Department of Computer Science and Engineering, University of Washington and Intel Research Seattle*
- This Location Stack demonstration gives participants the opportunity to experience multisensor location sensing. Participants are invited to don tracking badges and watch a projected visualization of the real-time probabilistic estimates of all participants' locations. For this demonstration, the sensors in use are RFID detectors and ultrasonic ranging badges. The Location Stack uses Bayesian filtering estimation techniques such as adaptive particle filtering to fuse measurements from multiple sensor technologies. Our implementation is publicly available and supports many common sensor technologies.

# Museum Interactive



- **Anatomy of a Museum Interactive: Exploring Picasso's 'La Vie'**
- Leonard Steinbach and Holly R. Withey  
*Cleveland Museum of Art*
- Attendees will be able to use the interactive and discuss it with presenters; a complementary videotape will show the interactive in use in the gallery in which it was placed.

# M-Views



- **M-Views: A System for Location-Based Storytelling**
- David Crow<sup>1</sup>, Pengkai Pan<sup>2</sup> and Glorianna Davenport<sup>2</sup>  
*<sup>1</sup>Media Laboratory Europe, <sup>2</sup>Media Laboratory, MIT*
- M-Views immerses users in a narrative experience by employing location awareness to control the flow of the story. The system delivers different media clips to a handheld device depending on user location and context. UbiComp attendees will be allowed to borrow a PocketPC in order to experience our latest location-based movie, 15 Minutes. Attendees may also elect to collaborate / IM with each other or even play through the story again to get a different ending. The whole experience should, in fact, take about 15 minutes.

# Noderunner



- **Noderunner**
- Yury Gitman and Carlos Gomez
- Noderunner is in itself an exemplar of an emerging culture – a culture where smart and wireless environments are as much an object of play as is an open grass field or an open lake. Two teams running against time must log into as many nodes as they can and submit photographic proof to a weblog which acts as a document of their score. UbiComp attendees will get a chance to play Noderunner and see a game played. At the exhibition area, attendees can watch a live game being played on monitors at a Noderunner table and talk to one of the artists about how Noderunner works. Others will be in the field and around the conference center looking for open nodes to score points on for a game of Noderunner in Seattle. An entire game of Noderunner will be played during the exhibition time.

# TGarden



- **Expressive Softwear for Responsive Playspaces**
- Joey Berzowska<sup>1</sup>, Arek Basirisk<sup>1</sup>, Jill Fantauzza<sup>2</sup>, Yvonne Caravia<sup>2</sup>, Sha Xin Wei<sup>2</sup>  
*<sup>1</sup>Faculty of Fine Arts, Concordia University, <sup>2</sup>GVU, School of LCC, Georgia Institute of Technology*
- We demonstrate multiple uses of “softwear”™: clothing augmented with sensors and gesturally controlled realtime media. Some performers with softwear instruments will improvise variable musical sound textures from gestures of varying intention and virtuosity. Other performers wearing softwear instruments will act as social probes into the dynamics of greeting, engagement and disengagement in the semi-public setting of the conference. These performers may move through any part of the public space. If logistics permit, we will demonstrate how with these softwear instruments people’s gestures can generate multiple media responses as people walk from one prepared region to another. As people pass through our prepared spaces, their gestures and movement will be amplified via elements of the TGarden ambient media choreography system. We encourage playful (non-game) exploration of the prepared public space.

# For more information

- Joe McCarthy
  - [seattleweb.intel-research.net/people/mccarthy](http://seattleweb.intel-research.net/people/mccarthy)
  - [joseph.f.mccarthy@intel.com](mailto:joseph.f.mccarthy@intel.com)
- Proactive Displays
  - [www.proactivedisplays.org](http://www.proactivedisplays.org)
- UbiComp 2003
  - Westin Seattle, October 12-15
  - [www.ubicomp.org](http://www.ubicomp.org)

Thanks! ... Questions?