Charting Past, Present, and Future Research in Ubiquitous Computing
Themes in UbiComp

- Natural Interfaces
- Context Aware
- Capture & Access
Natural Interfaces

Interaction between computation and humans should be more like the way we interact with our surrounding - *speech, gestures*, using writing instruments and alter *physical artifacts*.
Natural Interfaces

Challenges

- Richer data types required
- Error Prone Interaction
  - Error Reduction
  - Error Discovery
  - Error Correction
Context Awareness

Not just location and identity, but also incorporate the knowledge about time, history, people around the user and general ‘environment’ awareness.
Context Awareness

- **Who**: Identity
- **What**: Interpret Activity
- **Where**: Location
- **When**: Notion of time
- **Why**: Purpose of activity
Context Awareness

Challenges

- Representation
- Context Fusion
- Coupling Context with Interfaces / Augmented reality
Capture & Access

Tools to support automated capture of daily life information to augment the inefficiency of human record-taking - audio & visual, and also process and allow universal access.
Capture & Access
Capture & Access

Challenges

• Capture is not ubiquitous yet
• Raw streams - no processing
• Access - do we play everything?
• Access - lecture may not be organized
Everyday Computing

Providing continuous interaction and scaling ubiquitous technology and interaction techniques with respect to time. Activities being sensed don’t necessarily have start or end.
Everyday Computing

Challenges

- No clear start or end
- Interruption is expected
- Multiple activities happen simultaneously
- Time as discriminator
Additional Challenges

• Evaluating new ubiquitous technologies

• Security issues

• Invisible computing is counter to how people know they are being sensed