History and vision of Ubicomp

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Pre-history of Ubicomp

- Everything can be more than itself

Calm Computing

- Pervasive computing, calm computing, disappearing computing and invisible computing...
  - This is different from PDAs, dynabooks, or information at your fingertips. It is invisible, everywhere computing that does not live on a personal device of any sort, but is in the woodwork everywhere – Mark Weiser

Center vs. Periphery

- Different than “affordance”
Implicit inputs:
- High dimensional signals
- Noisy

Multiscale
Distributed

Technologies
Input
Output
Augmented Reality
Application: Context-awareness
- Location-aware (where), identity-aware (who), when, why …
- Activity-aware
- Context-fusion

App: Capture and Access
- Automatically recording
  - Free our memory
  - Lay off secretaries
- Fast retrieval
  - No excuse to be irresponsible

App: Continuous interaction
- Task oriented design vs. activity oriented design
  - Single-threaded program vs. multi-threaded program

Theory
- Models of interactions:
  - Activity theory:
    - Recognize actions, goals, operations from contexts
  - Situated action:
    - Make plan on-the-fly and improvisational
  - Distributed cognition:
    - Collaborative across the whole system
Theory

- Richer understanding of settings
  - We believe that people live through their practices and tacit knowledge so that the most powerful things are those that are effectively invisible in use [emphasis ours]. - Mark Weiser
  - Ethnographic studies

Theory

- Evaluation of the system performance:
  - Task-oriented
  - User-oriented
- Authentic deployment to evaluate
  - Museums
  - Outdoor city centers
  - Home
  - ...

Security and Privacy

- Digital footprint
  - Mark Weiser

Other Issues

- Wearable computing
- Power-efficient
- Prototyping
Questions

- Why human is effortless at the periphery?
  - The signal stays normal most of the time, seldom attracts people's attention.
  - The abnormal state and normal state are quite easy to tell from each other such that we won't be stressful to make a decision on the situation.
  - Anything else?