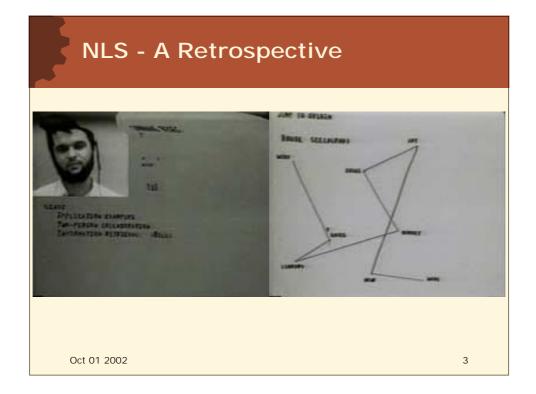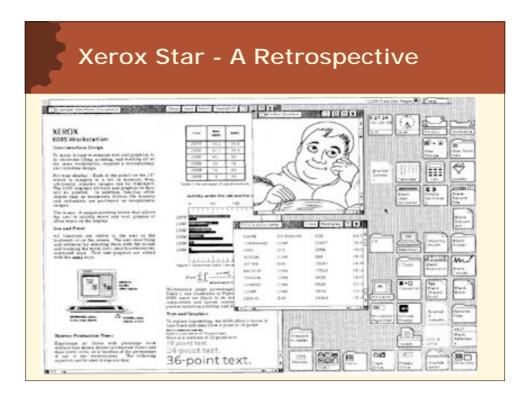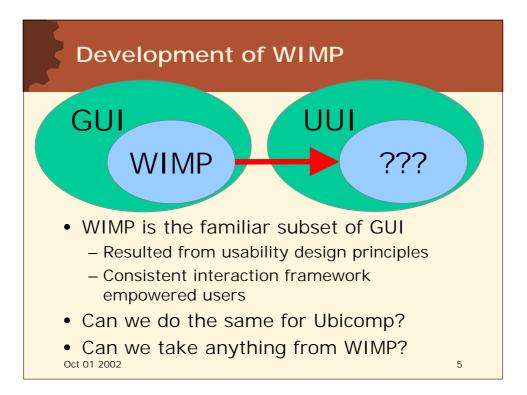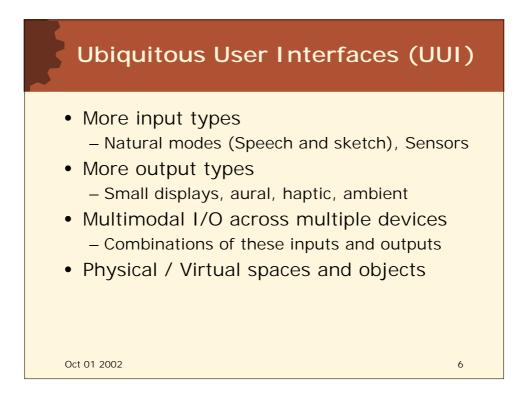# Group for
User Interface

University of California Berkeley

Towards a Unified Interaction Framework for Ubicomp User Interfaces

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Sketchpad - A Retrospective

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NLS - A Retrospective

Xerox Star - A Retrospective

Development of WIMP

GUI — WIMP → UUI — ???

- WIMP is the familiar subset of GUI
  - Resulted from usability design principles
  - Consistent interaction framework empowered users
- Can we do the same for Ubicomp?
- Can we take anything from WIMP?

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Ubiquitous User Interfaces (UUI)

- More input types
  - Natural modes (Speech and sketch), Sensors
- More output types
  - Small displays, aural, haptic, ambient
- Multimodal I/O across multiple devices
  - Combinations of these inputs and outputs
- Physical / Virtual spaces and objects

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Are There Things We Can Take from WIMP?

- Windows -> **A**ggregation, managing tasks
- Icons   -> **O**bjects, possible targets
- Menus   -> **C**ommands, visual affordances
- Pointer   -> **S**election, feedback on select

A Thought Experiment
Applying AOCS to UUIs

- Aggregations
  - Spaces, Tasks, Groups, Situations
- Objects
  - Physical objects, Virtual Objects
- Commands
  - Speech, gesture, menu selection
- Selectors
  - Holding things, Laser pointers, Pens, Pointing
  - Lots of potential ambiguity here

Open Questions

- Is it useful to apply AOCS to UUIs?
  - More for explicit interaction, implicit too?
  - Accessibility? Distributed I/O?
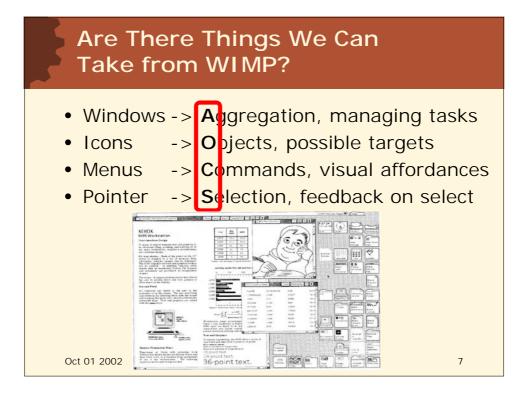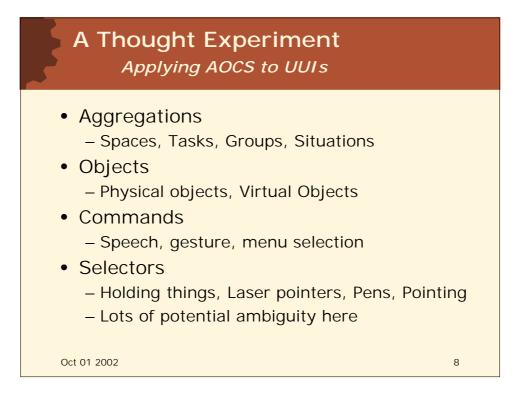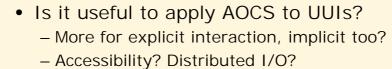 - What kinds of apps would it enable?
- How to implement AOCS for UUIs?
  - Good design principles, ex. visibility, conceptual models, mappings, feedback
  - Mistakes of WIMP? Ex. Groupware
  - How to start? WIMP was monolithic and an entire package, niches we can start in?

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