The Promise of Zoomable User Interfaces

Intro

Applications

Discussion

Unused Section Space 3

Ben Bederson
The Promise of
Zoomable User Interfaces

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Problem: Show More Than Fits on the screen

Rough solution types:
- Scroll
- Multiple pages (tabs, link, search ...)
- Denser displays (info vis)
  - Fisheye
  - Zooming

Is always a problem – and worse on small screens
Some early ZUIs

Pad 1993

Pa3D 1993

Pad++ 1994
Philosophy: What is a ZUI?

- Single vs. multiple documents
- Indirect vs. direct manipulation navigation
- No single view comprehensive

Word 🔄 Pad++

⇒ End Goal: Slide/print or interaction?
Animated Presentations

KidPad - 2001

CounterPoint - 2001

Microsoft PPTPlex - 2008

Prezi - 2008
Navigation Controls

Early work focused on navigating **space**:
- Specialized devices (i.e., Spaceball)
- Click left/right to zoom in/out
- Click left/right and hold to zoom in/out
  - Zooming point follows mouse
  - Zooming point fixed at mouse down
- Click and drag to zoom in/out (one button)
- OrthoZoom combines 1D scroll/zoom
- “Zliding” uses stylus with pressure for zoom
- Specialized keyboard controls

Later work focused on navigating **content**:
- Object-based zooming (i.e., PhotoMesa and pptPlex)
- Hyperlinks
PhotoMesa

- First attempt at building polished consumer ZUI
  - Object-based zooming
  - Domain-specific navigation
  - Domain-specific semantic zoom
  - Auto-layout
  - Perf tricks
  - Metadata & search

- Mobile version
Zooming for Overview

SpaceTree - 2002

TaxonTree - 2004
Some Modern ZUIs

- Google Maps
- Seadragon
- Canvas for OneNote
- Zoomorama
Walls, Mobile, Surface

Squidy
LaunchTile & AppLens
One-Handed Thumb Use on Small Devices

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[Karlson, Bederson & SanGiovanni, CHI 2005]
Zumobi ZoomCanvas
Benefit

- Engaging
- Feels natural
- Probably improves some task performance
- Probably hurts other tasks
- More creative potential
- Overviews
- Animation & structured content
Challenges

- Hard to scale
- Hard to author
- Temporal separation requires STM to integrate multiple views
- Spatial memory & spatial navigation limited
- Navigation controls non-standard, tricky
Design Guidelines

- Need small visual representation of object
- Small representations shouldn’t change aspect ratio
- Spatial layout consistent
- Spatial layout meaningful
- Spatial layout scannable by human eye
- Breadth over depth / Don’t zoom too deep
- Simple and consistent navigation mechanisms

See full paper – abstract in your handouts
Come to my iPhone programming tutorial tomorrow!