Small Displays

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Information Visualization
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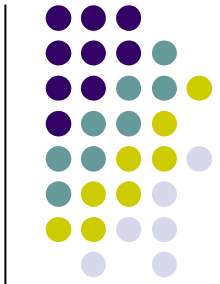
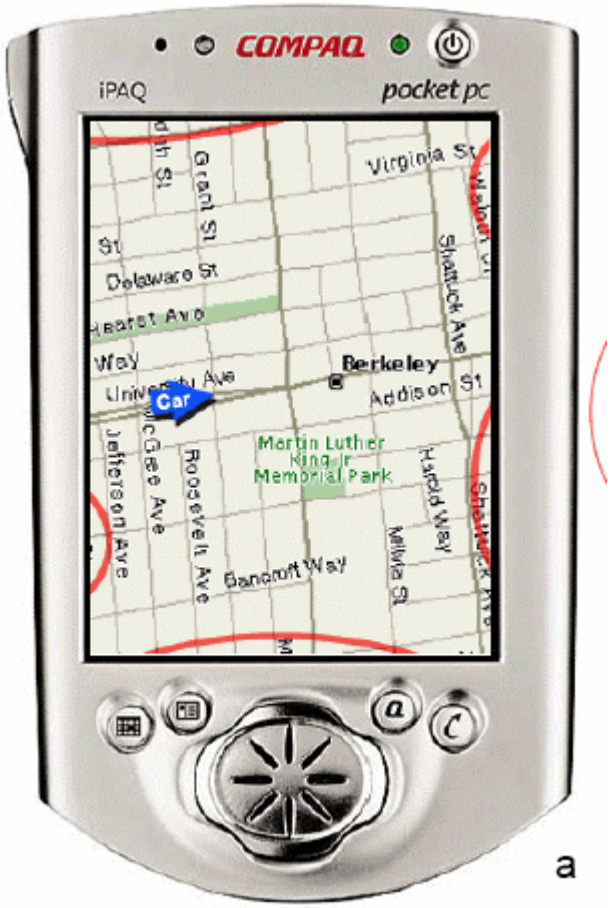
My new kitty, Erwin

Overview: Small-screen Displays

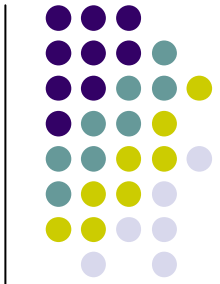


- Example of small displays
- What's the problem?
- Look at 2 different problems and possible solutions
  1. Web browsing on a small screen
  2. Navigating maps on a small screen
- Conclusion and overview

Examples of Small-screen Displays

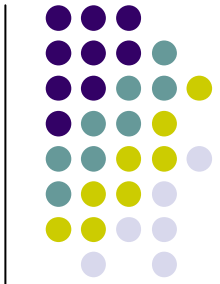


The Problem



- Screen Size
  - Apparently size does matter
- Information
  - What information do you need?
  - How do you get all the information you need?
  - Focus+ context, zooming
- Different interaction techniques

Web Browsing



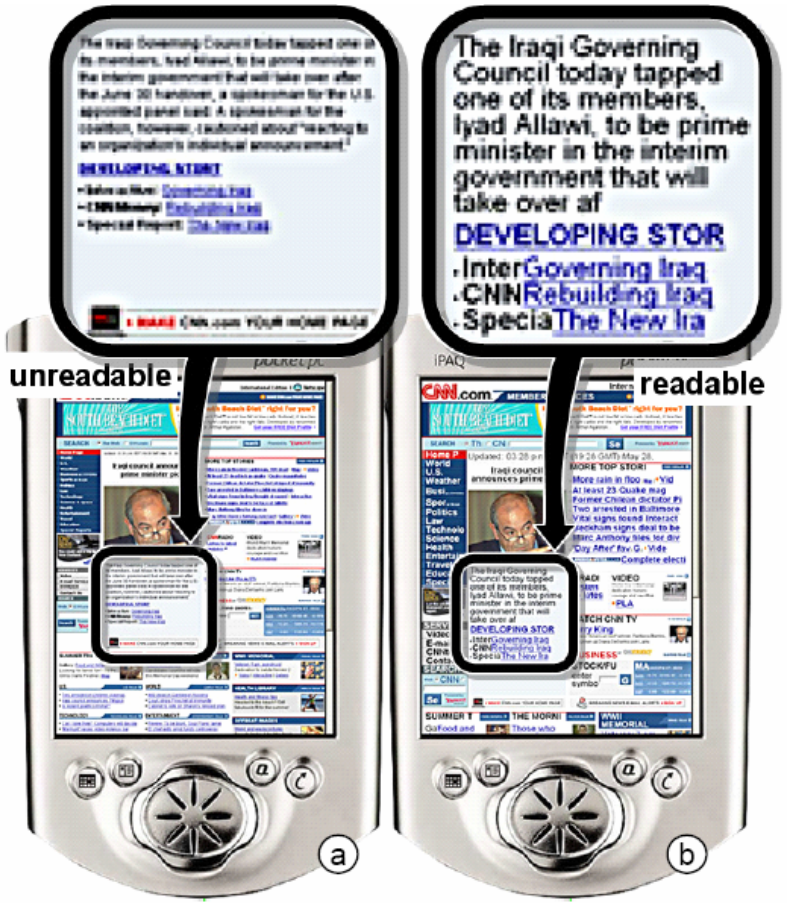
Summary Thumbnails: Readable Overviews for Small Screen Web Browsers

THE PROBLEM:

- How to display a web page so users can quickly and easily get the information they require on a small-screen display?
- Previous proposed solutions
  - Show web page as is: too hard to read
  - Thumbnails: text is too small to read
  - Column view: too much scrolling, doesn't preserve original layout of webpage

Proposed Solution: Summary Thumbnail

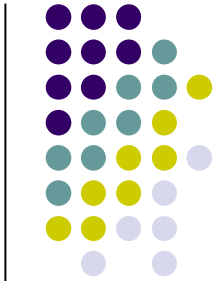
- Thumbnail of original webpage, but all text is readable
- Text is filtered and enlarged
  - Common words removed
  - Preserve line count



Findings from user studies

- Qualitative user study
  - 9 users looked at BBC news web page on 3 different interfaces to find an ‘interesting’ article
  - Summary thumbnail more useful than thumbnail for keyword search & more useful than single-column for finding a previously viewed area
- Quantitative user study
  - 11 users viewed set of different web pages in 4 different interfaces
  - Summary thumbnail:
    - Faster than single column
    - Needed less zooming than thumbnail

Critique



- Pros
  - Maintain overview and readable text of web pages
  - Performed both quantitative and qualitative user studies
  - Tasks created by interviewing volunteers and aggregating results
- Cons
  - Text may be hard to understand with words missing
  - Control Issues
  - Used desktop emulation

Overall:

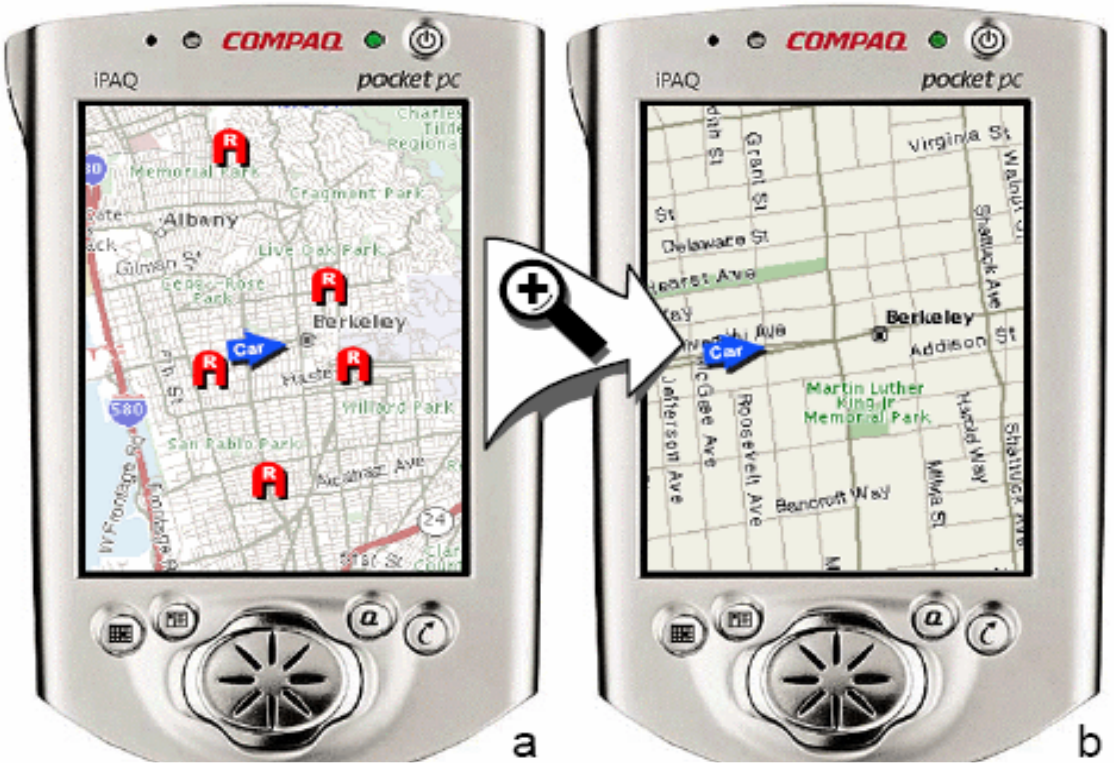
- Summary thumbnail is a good compromise between previous work (still get overview, but can read some text on screen)
- Not perfect solution, need better zooming interaction
- User study show 9/11 users would install summary thumbnail on their own PDAs

Map Navigation

Halo: A Technique for Visualizing Off-Screen Locations

THE PROBLEM:

If a user is viewing multiple locations on a map, once they zoom into one location information about the other locations are lost.



Proposed Solution: Halo

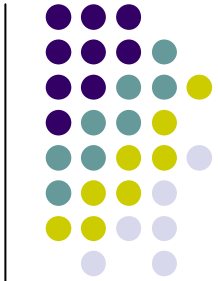
- For zoomed in views, add information for other locations
- Arcs
  - The size of arcs determines the distance
  - Street Light concept
- Demo

User studies

- Halo vs. Arrows

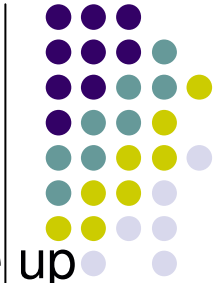
- 12 users completes 4 different tasks w/ both interfaces
  - Locate task
  - Closest task
  - Traverse task
  - Avoid task

Results



- Task completion time
  - Halo 16- 33% faster than arrow for all 4 tasks
- Error Rates
  - Halo interface produced more errors for the Locate task, but no difference for all other tasks
- Subjective Preferences
  - 6/11 preferred Halo
  - 3/11 preferred Arrows
  - 2/11 had no preference

Critique



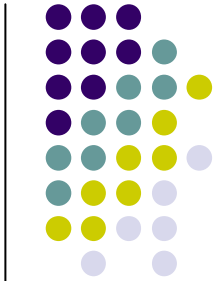
- Pros
  - Interviews of users who use map navigation system to come up with tasks
  - Don't have to annotate distance
  - User studies include 4 different types tasks
  - Can be used for all sizes of displays, not just small displays

- Cons
  - Arc concept may be hard to understand
  - An author of the paper was a participant in the user study
  - Used desktop emulation
  - Only useful for very specific type of task

Overall:

- A creative and simple solution to help users navigate
- User study demonstrates usefulness of tool

Overview



- Looked at:
  - Examples of different small displays
  - A way to help users view web-pages on a small screen
  - A way to help users use a map to investigate and navigate different locations
- Neither one of these solutions look at the actual interaction techniques of small displays
  - Field studies needed

References

- Baudisch, P. and Rosenholtz, R.
  Halo: A Technique for Visualizing Off-Screen Locations.
  In *Proceedings of CHI 2003*, Fort Lauderdale, FL, April 2003,pp. 481-488.
- Lam, H. and Baudisch, P.
  Summary Thumbnails: *Readable* Overviews for Small Screen Web Browsers.
  In *Proceedings of CHI 2005*, Portland, OR, Apr 2005, pp. 681-690.