Hardware Support for Digital Document Navigation

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Navigation In Paper Documents

Imagine you have a large book
- Jump to any spot
- Read while turning pages
- Flip quickly to search
Survey Of Navigation Techniques
Bimanual Interaction

Buxton and Myers (1986)*
Two touch strips side by side.

Slide Bar (Chipman 2003)

http://www.billbuxton.com/2HandsNarrative.htm
and Myers
Francois, 5/15/2006
Times Have Changed

- Digital documents are much BIGGER
- Absolute navigation becomes harder
  - More pages mapped to an area
  - Finger tracking becomes an issue

Notice how the bottom arrows diverge
I like this slides.

Please use better version of the pictures.
Francois, 5/15/2006
Treadmill Navigation Device
I will combine this abstract description with the real system picture on the next page.

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Users interact directly on touch screen
I am not sure we will need the experimental setting here.
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Experiment #1

- Between-subjects
- Find a picture within the document
- Starting location at different distances from target image
- Treadmill provided feedback about where document would jump to
Present one experiment at a time (present the first experiment completely first, then looking at this results present the second experiment).
Also your should mention the between/within aspect of the experiment.

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Experiment Results

Experiment 1 - Total Completion Time

Experiment 1 - Percentage of Trials Using Relative Navigation
Experiment #2

- Within-subjects
- Find a simple target
- No treadmill feedback
Surprising Discoveries

- Scroll bar is surprisingly fast
- Keys to its performance
  - Familiar
  - Stable
  - Reliable and predictable
  - Leverages hand-eye coordination
You introduced two experiments but only presented one. You should present the new experiment (including the simplification)
Francois, 5/15/2006
Next Steps?

• Cost and complexity an issue
  - At the moment the solution & improvements are not practical

• Other avenues to explore
  - Only use relative navigation (have fast and slow touch strips)
Big Lessons

- Scrollbar has many good properties
  - Updates to previously held beliefs
- Hardware solutions are hard to justify
  - Cost of hardware means the device must significantly outperform software solutions
Hum, that does not seem like a big finish to me. What about providing stronger conclusions?

Francois, 5/15/2006
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