Paper Windows: Interaction Techniques for Digital Paper. Holman, et al. CHI. 2005.

What are the core research questions addressed by the work?

- Merging the digital world of computing with the physical world of paper

What motivates the work?

- Merging the physical and digital can potentially improve the richness and value of both technologies

How does the work understand the usage, capabilities, and limitations of paper?

- Capabilities of paper:
    - Documents presented on paper can be moved in and out of work contexts with much greater ease than with current displays
    - Paper can be folded, rotated, and stacked along many degrees of freedom
    - Paper can be annotated, navigated, and shared using extremely simple gestural interaction techniques
    - Paper allows for greater flexibility in the way information is represented and stored, with a richer set of input techniques
- Limitations of paper:
    - Difficult to distribute, archive, query, update

What is the target application domain of the work?

- Ubiquitous computing

What are some proposed extensions to paper proposed by the work?

- Allow the use of paper as an input device by projecting digital windows and enabling gestural interactions
- Enable wireless, high-resolution communication with computer display
    - The paper display should be annotatable, shareable, interactive
- Using a distilled set of interaction grammars (hold, collocate, collate, flip, rub, staple, point, and two-hand pointing) enable the following: activating a document / window, selecting items within a window, copy and pasting (from computer to paper, between paper), scrolling, browsing, generating parallel views, annotation, scaling, sharing, open, save and close

What design constraints or objectives guided the work's implementation of the proposed extensions?

- It should support flexible navigation
- It should support cross document use
- It should support for annotation while reading
- It should support interweaving reading and writing

How are the proposed extensions implemented?

- Augmenting paper with InfraRed (IR) reflective markers tracked using a Vicon Motion Capturing System
- Projection for display simulation
- Augmented pens for input

What findings have been obtained from either the implementation process or an evaluation of the proposed system?

- Scrolling action required less effort on the system than on a PC
    - Explanation: Act of flipping a page is such a direct physical correlate for the act of scrolling that it requires little to no mental effort to complete, affordances of paper enhanced their belief that the underlying computing system was reliable and simple
- Basic gesture set followed user need for “how-it-works” knowledge of the system
- System could reduce mental effort for interaction via providing a more natural means of doing so