The Missing Link: Augmenting Biology Laboratory Notebooks. Mackay, et al. UIST. 2002.

What are the core research questions addressed by the work?

- Provide a link between paper, physical artifacts, and on-line data to support biology lab notebook use

What motivates the work?

- Research biologists face a complex information processing task, managing physical paper documents, physical research specimens, on-line documents, and on-line services - forced to constantly juggle paper and electronic forms of the same information

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

- Capabilities of paper: easier to read, meets subtle needs for people working collaboratively, lightweight, ubiquitous, inexpensive, easy to use
- In the context of biology research
    - Notebooks are official documents and the product of careful reflection
        - Intended as both a personal record and a public document
        - Research findings always dated, critical for future claim
    - Biology notebooks are extremely multimedia documents
    - Notebooks preferred for its simplicity and flexibility
        - Liked ability to freely highlight, annotate, and sketch
        - Some tasks cumbersome: creating tables, searching
    - Paper found to be very efficient: quantity of hand-writing is small, formatting easy, sketches and annotations added at will
- Digital systems enhance communication and data analysis

What is the target application domain of the work?

- Biology research

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

- Lists three technical problems their work addresses: capturing user information, display information in response to commands, managing the link between physical and on-line data
- Digitize cumbersome tasks like creating table of contents/index, searching through minutely different information, accessing information in colleague's notebooks
- Support indexing and accessing data (esp. which is not retained from physical book), storing media without decay, persistent digital storage

How are the proposed extensions implemented?

- Iteratively developed three prototypes: a tablet prototype, a cross-pad prototype, and an "a-book" prototype
- The A-book Prototype: Records user writing on paper, enables interaction through a sort of magic lens metaphor (e.g. for creating digital links)
    - Three peripherals: inking pen (for writing on paper), non-inking pen (for interacting with the Interaction Lens, and a 4D mouse for tracking the position of the interaction lens

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

- For the prototype to be actually deployed in a biology research setting, it must be entirely fail-proof