Designing Interactive Newsprint. Frolich, et al. IJHCS. 2017.

What are the core research questions addressed by the work?

- How can digital augmentation resurrect increasingly obsolete forms of media?

What motivates the work?

- Established guidelines on designing interactive paper interfaces are lacking
- Newsprint as a promising domain for interactive paper has not been fully explored before
- Newsprint benefits from several interactive properties or affordances of paper, that indicate its potential as an interactive medium
- The advent of digital news consumption makes reconsidering the design of newspapers imperative from a business perspective

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

- Newspapers benefit from several interactive properties or affordances of paper
    - Newspapers can be flicked through to assess their contents quickly, jointly viewed, annotated, and passed around physically without the need for compatibility between devices or formats
    - Newspapers are easier to share and collaborate around than their e-book counterparts, being not only mobile, but “micro-mobile” allowing elements to be spread out, re-oriented, juxtaposed and memorized spatially
- The information and graphic design of newspapers lends itself to interactivity via digital augmentation: Headers, sections, and pictures can be used to locate interactive regions
- Digital augmentation could also overcome the limitations of space on paper
- Newspaper circulations have fallen since the 1970s, and the trend has been accelerated by the advent of digital news consumption as readers switch to on-line news content
- Multimedia nature of modern news could be partially recreated across print and digital platforms by linking between them, audio can be overlaid on print content, and even updated dynamically, the ability for readers to respond to articles can be supported by voting on, or even speaking to, paper

What is the target application domain of the work?

- Newsprint

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

- Seamless access to audio information through handling gestures
- Enable interaction with “voting” and ranking

How are the proposed extensions implemented?

- Four components: A sheet of paper with screen printed conductive ink, a capacitive touch module, battery pack, and a bluetooth module
    - Bluetooth module connected to a laptop to play audio and handle interactions

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

- Recommendations from a product design perspective
    - Audio-augmented newspapers should be designed in newspaper form to provide “bonus” information and the chance to respond

    - Audio-augmented leaflets might be valuable in a public setting where information is shared and discussed
    - Audio-augmented paper represents a new opportunity for promoting music through its' packaging
- Recommendations from a UI Design perspective
    - Develop standardized touch point icons and print conventions to indicate interactive areas and functionalities
    - Clearly indicate the type and length of hidden content
    - Indicate the destination of voting information
    - Feedback should be timely and clear
- Recommendations from an interaction design perspective
    - Give immediate audio-feedback on touch actions over the paper
    - Provide in situ audio control for play and pause
    - Place touch points in the margins of pages within thumbs-reach
    - Avoid placing touch points in the same place on boths sides of the paper
- Recommendations from a content design perspective
    - Make print and audio content complementary, playing to the strengths of both media
    - Use recorded interview content to increase the trustworthiness of news stories
    - Personalize stories with the spoken voice
    - Provide reader incentive to vote
- Technological limitations
    - Print newspapers are made of the thinnest and cheapest forms of paper on the market, making it difficult to print on and providing little scope for attaching additional electronic components
    - Difficult to currently assemble robust working prototypes with off the shelf components