

Library Collection Shoals For Multi-Touch Tables

John Sear¹, Chris Creed¹, Jo Sivell¹

¹ Digital Humanities Hub, European Research Institute, University of Birmingham,
Birmingham (UK), B15 2TT
{j.a.sear, creedcpl, j.sivell}@bham.ac.uk

Abstract. We introduce a new multi-touch table “shoaling” application that we have been working on with the new Library of Birmingham (UK). This application contains shoals of assets taken from the Library’s collections that flock and swim around the tabletop. The assets are initially represented as small circular crops taken from full-size assets that attempt to intrigue and draw users in to explore further. These cropped circles can then be selected by visitors and expanded to reveal the surprise of the full asset. In this paper, we provide an overview of the shoaling application and share the design considerations that had to be taken into account when attempting to create a shared and collaborative visitor experience.

1 Introduction

Multi-touch tables are increasingly being deployed in public organisations such as libraries, museums, and art galleries (e.g. [1-5]). As part of the Digital Heritage Demonstrator project we are collaborating with multiple cultural and heritage partners to create interactive experiences on multi-touch tables. One of our partners is the new Library of Birmingham (LoB) which became the largest public library in Europe when it opened on 3rd September 2013 (Fig. 1). An ongoing challenge for libraries is making the general public more aware of their archival collections and getting visitors to engage with these items more regularly. Over recent months we have been working closely with LoB staff to design a novel touch table experience for the general public that showcases their varied collections. In this paper we provide an overview of the “shoaling” application we have developed that presents the Library’s collections to visitors using an innovative approach. We also discuss some of the design issues we had to address in order to ensure that the application was optimised for shared and collaborative multi-user interactions.

2 Shoaling Multi-Touch Application

The LoB is the custodian of a number of important archive collections. These include Wingate Bett Ticket Collection, Parker Children’s Books Collection, Great

Western Railway Collection, USA postcard collection, Song Sheets and Silent Movie Scores Collection, and numerous photographic collections. The design challenge, therefore, was to help make the public more aware of the vast array of collections available at the Library (as opposed to focusing on a single collection). In particular, it was decided that the application should encourage discussion between multiple users and be a starting point for conversations with library staff instead of being a single-user research tool. The design process involved multiple workshops with LoB staff (including curators, IT personnel, and digital strategists) for concept generation and refinement.



Fig. 1. The new Library of Birmingham

The chosen concept involves the idea of shoals of related objects from the library's collections that swim around together in an organic fashion (i.e. like shoals of fish). A similar approach was used by Ståhl et al. [6] in "The Pond" application where shoals of music collections float around the table. The objects in our system are initially small circles that highlight a cropped section from the main asset - the goal is to intrigue users about what the main asset might be and then to surprise them when they open it up (via a pinch/zoom gesture). The objects within a shoal also attempt to stay together - for instance, if a user selects an object and drags it out of a shoal, the other members will "swim" over to the one that has been removed. The aim here is to subtly communicate to users that all objects within a shoal are related - it also enables visitors to more easily view additional assets related to the one they have selected. This design allowed us to easily group together items from multiple collections and have them displayed on the table in a dynamic and visually engaging manner (Fig. 2).



Fig. 2. Screenshot of the LoB touch table application

3 Supporting Collaborative and Shared Experiences

The LoB has a very diverse user audience and there were many issues we had to consider to help support shared and collaborative interactions around the table. These include the number of shoals that it is comfortable to have on the table at one time, the number of objects contained within a shoal, shoal movements (small and fast versus large and slow), how to make it clear to the user that individual objects belong in the same group, the maximum expansion size of individual assets, educating users about possible touch gestures, and the impact of sound effects in a library space. Many of these considerations are based on whether the overall feel of the application should be a fast and fluid experience with the shoals exhibiting flocking-like behaviour or a slower and more relaxed one allowing more time to contemplate the assets.

In terms of the expansion size of individual assets we had to choose between allowing users to make the assets larger than the size of the table or whether we should constrain this to a smaller size. The ability to zoom into the details of some assets (e.g. detailed high-resolution maps) is one of the key and unique benefits of touch tables - however, during initial user testing we felt that enabling users to make an asset larger than the whole table detracted from a shared experience. Users tended to take over the whole screen and the other shoals of cropped circles were completely obscured - we therefore decided to restrict the maximum zoom size so that users could still zoom without ruining the experience for other visitors.

Another key design issue was related to educating new users about how to interact with the application without irritating more experienced visitors. In initial user tests we found that many users were not aware that they could perform a pinch/zoom gesture to expand the cropped circles. Instead, they would simply watch the shoals

flock around the table or drag some of the items out of their shoal. They were therefore missing out on a key element of the interaction which involved revealing the surprise of the larger asset. To address this we explored a variety of potential solutions including attaching instructions (via text and icons) to assets when they were tapped that explained how to expand them. We also experimented with attaching instructions to random sets of assets and fading these in and out over a set time interval (i.e. around every ten seconds). However, we felt that these approaches "polluted" the interface too much and would be frustrating for users who intuitively understood how to interact with the application or those who had earlier seen the instructions and learned how to manipulate the assets. We therefore opted for a message that fades in and out every few seconds around the border of the table. It was felt that this struck a balance between enabling new users to understand how to interact with the assets as well as being less intrusive than other approaches. Initial observations in the wild suggest that new users are able to understand much better how to interact with the application - although further testing is still required to empirically confirm this is the case.

The shape of the crops contained within the shoals was another design issue we focused on to help ensure the application encouraged simultaneous interactions between multiple users. We initially considered rectangles, squares, and rounded rectangles, but decided that circular crops better supported a 360° design as users can approach the table from any position and comfortably start interacting with the content. The circles were also programmed to rotate within their shoals to help ensure that all users could get a sense of what the crop contained from any position around the table.

4 Conclusion

In the build up to the opening of the Library three soft testing events took place involving 250, 500, and 1000 participants respectively. During these evaluations we were able to run the application under different configurations to observe how this altered user behaviour and engagement with the Library's collections. We are also planning to run a more formal "in the wild" evaluation over several days to help get a better sense of how the application influences multi-user experiences. At the workshop we would like to share our experiences during the design, development, and evaluation process. We will also provide feedback on visitor responses to the application, usability issues observed, and plans for future work. Furthermore, we have worked on other projects that have involved the development of touch table applications in libraries and museums (e.g. [5]) and can share our findings from previous work in this space.

References

1. Geller, T.: Interactive tabletop exhibits in museums and galleries. *Computer Graphics and Applications*, IEEE, 26, 5 (2006) 6-11

2. Hinrichs U., Carpendale S., Group I.: Interactive Tables in the Wild - Visitor Experiences with Multi-Touch Tables in the Arctic Exhibit at the Vancouver Aquarium. University of Calgary, Computer Science (2011)
3. Hinrichs, U., Schmidt, H., & Carpendale, S.: EMDialog: Bringing information visualization into the museum. *IEEE Transactions on Visualization and Computer Graphics*, 14, 6 (2008) 1181-1188.
4. Hornecker E.: "I don't understand it either, but it is cool" - Visitor Interactions with a Multi-Touch Table in a Museum. In: 3rd IEEE International Workshop on Horizontal Interactive Human Computer Systems (2008) 113-120
5. Creed, C., Sivell, J., Sear, J.: Multi-Touch Tables for Exploring Heritage Content in Public Spaces. In: *Visual Heritage in the Digital World*, Springer Cultural Computing Series (2013)
6. Ståhl, O., Wallberg, A., Söderberg, J., Humble, J., Fahlén, L. E., Bullock, A., & Lundberg, J.: Information exploration using the pond. In *Proceedings of the 4th international conference on Collaborative virtual environments*, ACM (2002) 72-79