
Bear Abouts: sharing stories across the physical and digital

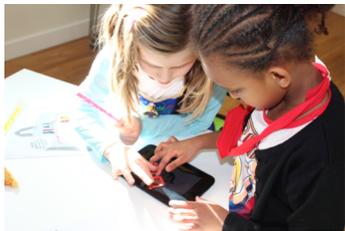


Figure 1: children aged 5-7 years using Bear Abouts.

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Abstract

We have developed an interactive storytelling platform for mobile devices that encourages children to engage in story creation across both digital and physical spaces. In our pilot study we have found that when using Bear Abouts, children engage in open-ended creative activity with tablet devices, and they also re-tell and re-frame narratives with each other. The platform does not use external electronics hardware, and has the potential to be a low-cost option for tangible interactions. This paper provides context for the demo of the Bear Abouts platform.

Author Keywords

Creativity and Children; Tangible; Novel applications for children; Storytelling; Play; Mobile Devices.

ACM Classification Keywords

H.5.m. Information interfaces and presentation: Interaction design

Introduction

Recent reports show that younger children are mostly engaged in solitary activity when using mobile or tablet devices [1, 2, 3]. Rather than the viewing or playtime being a shared experience, in what is known as “joint media engagement” [4], the studies demonstrate that mobile media tend to be used by single participants. Addressing this type of use is important because children develop through social interactions, and joint engagement is integral to learning processes [4, 5].

We have identified two possibilities for exploring more social ways of engaging with digital media. These are

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(1) through creative play with stories, and (2) through tangible interactions. We have developed a storytelling app called "Bear Abouts" that explores these possibilities with children.

The first possibility for a more social interaction is through creating stories, or sharing stories with others. Storytelling (i.e., creating and sharing stories) is a social activity [6, 7, 8]. Storytelling is also a method used to learn socially [6, 5]. The second possibility for exploring social engagement is through tangible interactions. Paul Dourish [9] explores the crossover between tangible and social interactions. He describes this intersection as "embodied" interaction. For Dourish, tangible interfaces encourage active participation between media participants in real space [8]. This

encourages joint engagement and social interactions.

Related Work

The Bear Abouts app builds on prior work in embodied interaction and storytelling. There are a number of interactive devices that access and create stories using a combination of physical and digital environments. These tools expand on embodied interactions through tangible interfaces. *Storymat* [10] and *Animal Blocks* [11] were developed at the Gesture and Narrative Language group at the MIT Media Lab, and *Jabberstamp* [12] and *TOK* [13] combine multiple sensory experiences to develop interactive stories. In our work, we combine storytelling and embodied interactions with mobile devices to create a platform that can be used without external electronic hardware,

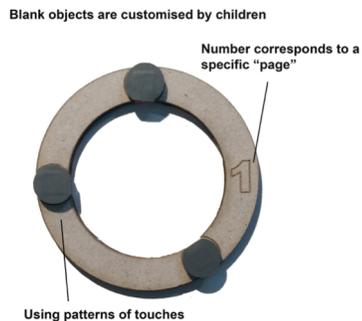


Figure 3: Blank story objects.

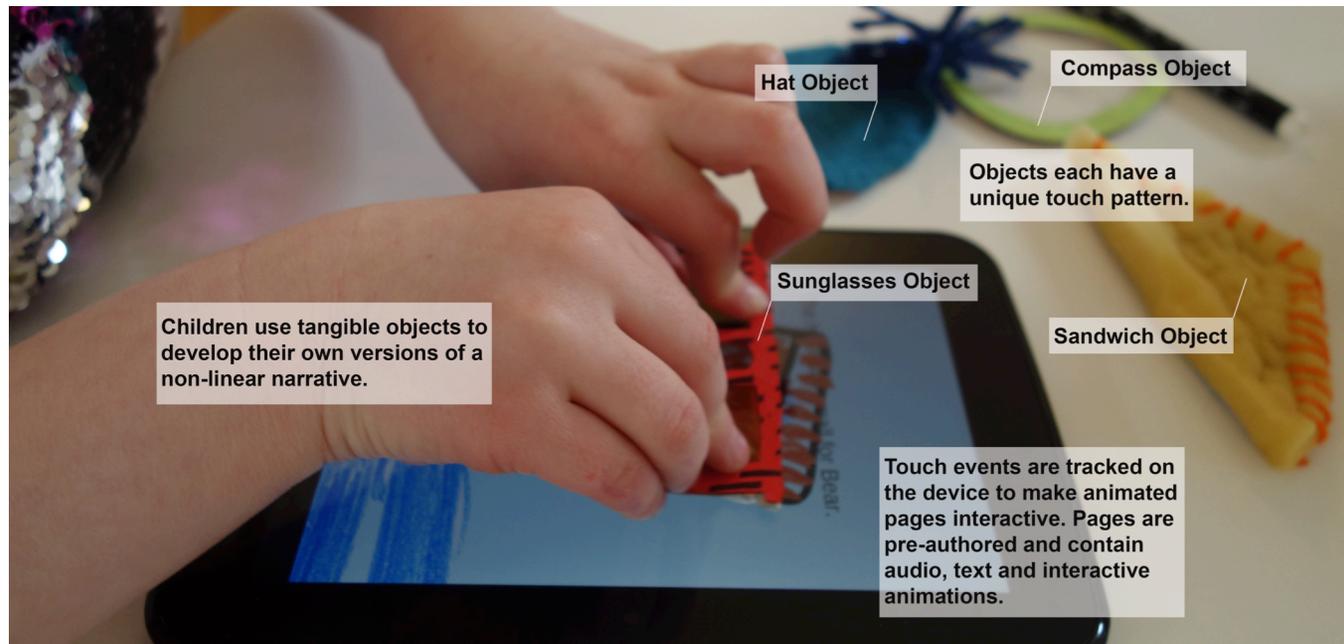
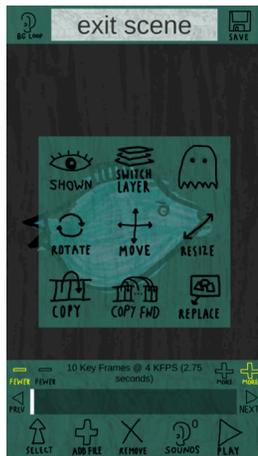


Figure 2: The current iteration of Bear Abouts (2017) uses custom patterns to connect paper objects with the storytelling app through capacitive touch.



(a)



(b)

Figure 4: Bear Abouts story making platform. The story editor(a) and a collection of "pages" in a story (b).

making it affordable for use in everyday or domestic environments.

Bear Abouts System

We have iterated the design over 2 years (2015-2017) to its current form (see figure 1). Bear Abouts is made up of physical objects and a digital platform (see figure 2). The platform recognizes a unique touch pattern on each object. The pattern is attached to paper objects with adhesive copper (see figure 3). The system uses machine learning to recognize each object (it can be calibrated to avoid variation error), and it recalls audio, text, and illustrations that are conceptually connected to the specific objects.

The initial design and development was focused on storytelling through physical artifacts, looking at non-linear narratives and the creative impact of allowing children to be the creators. Based on early user interactions, we developed the system so that people can add and edit their own stories, as well as re-tell other people's stories. Through our public tests we developed the platform to allow it to be a creation space, encouraging embodied interaction, story sharing, and story creation.

Doing it together

There are two methods of engaging with the current Bear Abouts system, (1) through connecting parts of a pre-made story, and (2) through developing an original story, and playing back.

In the first method (shown in figure 1 and 2), children develop narratives through piecing together elements of the story. In this version, each physical artifact is connected a "page" in the story. Pages are pre-made and include text, audio active animation that responds to the objects, and background animations that run on a loop. The order in which you place the objects on the screen determines the order of the narrative.

In a pilot study with 11 children aged 5-7 years, children worked together to develop narratives through arranging the connected objects to form a non-linear story. The Bear Abouts story is based on a migrant bear who has a bag of useful objects to aid him on his journey. Inside the bag are sunglasses, a sandwich, a compass, and a woolly hat (see figure 2). In the study, children developed their own narratives through determining the order in which they used the objects to help the bear. By doing so, the children developed verbal narratives together and when asked to recall their version of the stories, they used the objects as props to retell them. We found that children mostly used the device in groups, either taking it in turns to pass the objects between each other and sharing the storytelling between them; or by co-creating narratives together as they went along (see Table 1).

The second method to interact with the system is to develop your own narrative using our custom story-making platform and "blank" objects. The blank objects can be customized and are mapped to a "page." Children (or story-makers of any age) can add text, animations, illustrations, and audio to a page using the custom editor (see figure 4). When in "play" mode, a collection of pages (i.e., a story) can be played back using the customized objects, in a similar way to method (1).

Future considerations

This is a pilot study. Our preliminary research has involved tests with small groups of children and story-makers. We are currently carrying out further research into how children use the platform to read or listen to stories, as well as how they co-create with the platform. Future work on this can explore how a larger number of participants experience the platform.

A significant part of our design process has been concerned with developing sensors and software that connect paper with tablet devices without the use of external hardware. Now that we have stable systems,

Device usage	No. of Children
Use of device with another child through collaborative play	5
Use of device with another child through taking in turns	4
Use of device on their own	2

Table 1: Children's pattern of device usage with Bear Abouts, in study of 11 children aged 5-7 years.

our next step will be to iterate the design through further testing with children at libraries and homes in the UK; this research is planned to start in the summer of 2017.

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Practical Considerations

The demo is self-contained; the only provision needed would be power sockets to charge the mobile device.

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