Show and Tell: Supporting Children's Search by Interactively Creating Stories

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ABSTRACT
In this paper, we describe the Show and Tell system for childrens' interactive search. This encourages children to conduct searches by creating an entertaining digital artifact.

Categories and Subject Descriptors
H3.3 Information search and retrieval

General Terms
Human Factors

Keywords
Children, interfaces, complexity, search

1. INTRODUCTION
Online information is now a standard component in most childrens' information worlds. Children are encouraged to use the Internet for education, have specialized online resources created for their entertainment and increasingly have Digital Libraries created specifically for their use [3]. Most schools, at least in affluent Westernised countries, have computers in the classroom and many nurseries have computers for use by pre-school children.

However, the majority of research on search interface and interaction design has been on software intended for literate, adult users. Whilst this research has led to many successful and popular systems, the increased use of computers by children has focused attention on information access tools for younger computer users, e.g [1, 2, 3]. Studies of children's search behavior and interaction styles, notably those by Bilal et al. [1,2], Druin et al. [3, 6] and Large et al. [5] have shown that there are differences in how children interact with information systems and that these differences can be exploited to provide child-appropriate information systems.

However, what these studies have also shown is that, beyond a few basic design principles, we don't yet know what are appropriate interface models for childrens' search systems. The response by most system developers to childrens' design needs is often to simplify content, to add visual content or to simplify the interaction to a few basic interactions. This approach sees children as simple versions of adults rather than responding to the specific needs of children using search systems [7].

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2. DESIGNING FOR CHILDREN
In this paper we focus on young children around the ages of 6-9. These children are developing cognitive and computer skills, are developing their vocabulary, their ability to read information and are learning to interact cooperatively. This group of children as information seekers faces three core problems:

1. Young children often struggle with the complexity of information seeking. Children do engage in complex thinking about searching [7] but can struggle in creating appropriate strategies to perform complex searches. This is particularly true for actions such as querying; although children like to issue queries and have many definitional search requests they can have problems with creating queries and are less able to generate a good search request [5].
2. Children can also struggle with complex information displays and are more susceptible to lose their way in interfaces with too many special features [4]. So although we want features that engage children in their natural interaction we also want the system to help children structure their information search and provide external motivation for completing a search.
3. A particular feature of children's information seeking is that they often engage in non-linear information search behavior [1], following interesting information rather than information that is useful for completing a task. This is not an issue if the search is simply for pleasure; in other settings where there is often a particular defined task (e.g. writing a report for school) then search systems should help the child keep focus.

The system we describe in this poster is an attempt to help children with complex parts of searching (in particular query creation and reformulation and task structure) through interface design.

3. SHOW AND TELL
In Figures 1 and 2 we present a prototype called Show and Tell (SAT). In SAT the child *shows* an object to the system and the system responds by *telling* the child something about the object.

SAT operates a book metaphor, a familiar concept for children. The child initiates a search by showing the system an object which they want to learn more about. This decision is based on many scenarios we have encountered in our work with school-age and nursery-age children in which children either present an object to an adult to initiate a discussion or in which children are given objects (or object representations such as images) to

learn more about. The latter we found common in school projects.

In this version of SAT the child gives an image of the object to start the interaction. This image may be from an existing source, such as a website that they have found interesting, an image that an adult or friend has given them, or may be from a digital camera, e.g. as the result of a school or family trip. A second version of SAT, under development, uses GPS information associated with images as additional sources of information for images from children's cameras.

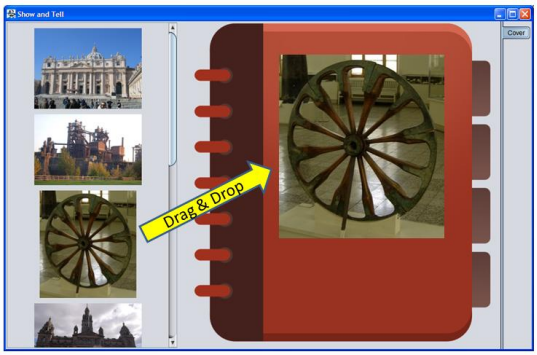

Figure 1: Show and Tell initial interface

The child's image becomes the front cover of the book and the focus for the searching task, Figure 1. Using an online tagging service the image is tagged with simple concepts which are used as a query to initiate searches on various search engines, returning a mixture of child-appropriate text, images and video.

On opening the book SAT provides a selection of these search results on the left hand page, Figure 2. The right hand pages of the book are where the child selects those objects to create their own story: using drag and drop the child can move the useful result to their own page. Text can be read aloud by SAT if the child clicks on the speaker icon.

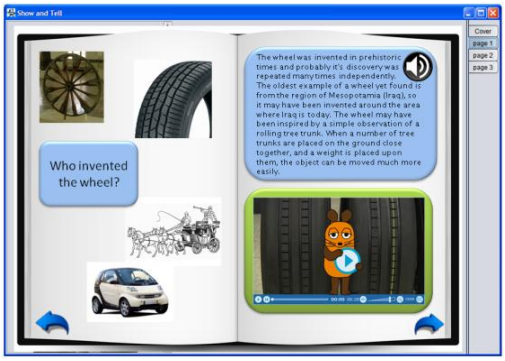

Figure 2: Show and Tell story-building interface

The default book has 3 pages (a variable parameter which can be adapted for older children who may be tackling more challenging tasks) which the child should complete to finish a story. As the child fills each page SAT uses selections from the previous pages to select new results, using a form of relevance feedback to modify the query and information on the types of media selected to determine how many of each type of object to show in following pages. SAT, therefore, adapts subsequent results based on previous interactions.

After 3 pages the child can continue his book by requesting more pages or save his book in a virtual bookshelf so he can continue, update or reference the book later. SAT can be used in two modes: independently by older children or in mediated used with an adult helping the child. With this age range mediated use of systems is often common [7] as is group work within classrooms.

SAT is an attempt to work with what skills children do have – the ability to identify interesting material and connect information through telling stories – and allow the system to make difficult decisions – how to create queries and select what information to show children. The work is an attempt to help children with task structure and the maintenance of a task using a familiar metaphor to children, as they know books have a main topic and consist of a series of pages. For children, books are designed to be entertaining and in SAT the task of searching for information is translated into the task of creating an entertaining object for other people.

4. REFERENCES

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