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# An Adaptive Browsing-Based Approach for Creating a Photographic Story

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## ABSTRACT

Pictures are often self-explanatory; they capture a moment in time. However, a single photo cannot represent the whole moment. The creation of photographic stories is a means to better preserve memories. Relying on the content-based and contextual metadata within digital photos we could assist users to explore their collection to create the stories with regard to their events and experiences. In this poster we propose a novel approach for supporting the self creation of stories with digital photographs. By incorporating an adaptive learning scheme to capture implicit user feedback, our approach supports content and context assisted browsing.

## 1. INTRODUCTION

Photographs are not just frozen moments. Each of these moments leaves us with a visual impression inside our memories. Nevertheless, there would be a better way to employ those pictures to illustrate our experience and commemoration with a more lively viewing experience than to look at a few solitary immovable images. An animated presentation of photographs can better preserve memories and make the photo viewing process more enjoyable. The picture stories are also valuable materials for creating personal diaries, educational and historical records. For example, a student travels to Italy on a field trip of a historical course; he visits many cities, such as Rome, Venice, Florence etc, and takes many pictures of historical landmarks and artefacts. He would like to create a distinct report for his study and share his experience during visits to his family and friends. Therefore he decides to create the story of his journey using his pictures. Moreover, whenever he looks at the story, he may remember where and what he had been and seen before. He could also add external knowledge to complement the story such as symbolic music of city, landmark description and so on.

Many visualisation techniques for creating photo presentation have been developed in this domain. A photo book system creates a photo album by leveraging information learned from many users [1]. A tiling slideshow system from [2] generates a descriptive presentation via elaborate the photo arrangement. Spatial slideshows are created by mapping personal photo collection using visual communication related to place and event [3]. The inverse method for creating a photo story has been introduced in

[4]. The image importance with respect to a textual story is quantified by the use of a mutual reinforcement principle based on Wordnet-based lexical and visual similarity. Although aforementioned previous works deal with tackling the problem of visualising personal pictures, there have been a few research studies on handling an actual unorganised home user collection for the story creation purpose. The search process is explorative in nature, in which a user's need may change dramatically due to the exposure to new information. We require an adaptive search system, which has the ability to allow for an intuitive and user-centred search process. Also constructing a story is a creative process. It would be better to allow users to create their own experiences by themselves. The self story creation is context dependent. Thus in this poster we propose an adaptive browsing-based system with functionality to support the creation of stories with digital photographs. A user simply browses his photo collection based on textual and visual features and time information to search his photos to create a story. The system adaptively tailors retrieval to match the user's developing information needs which can change within search sessions. In Section 2 we describe the architecture of the system, and we present the conclusions and future works in Section 3.

## 2. System Architecture

In this section, we propose "Ostensive Browser Plus (OBP)"; an adaptive browsing-based system with a capability of story creation. The OBP is a client-server retrieval system which ideally allows a user to share their digital images on the server side. We simulate a personal user collection using a COPHIR collection [5]: a real personal user collection from the Flickr archive which provides high-level metadata and low level features such as photo-taken time and colour-layout. The keywords are derived from user tags validated by a dictionary checker. The system is designed to adaptively modify retrieval to match the user's developing information needs based on the Ostensive Model (OM) [6]. The goal of the system is to help users to self create stories by browsing their photo collections according to the collection's content and context.

### 2.1 Interface

Figure 1 shows a screenshot of the OBP system. The interface can be divided into two main panels. As shown in Figure (1a), the left panel consists of 3 tabs, Control Tab (A), Full View Tab (B), and Presentation Tab (C). The right panel is the Browse Panel (D) which provides a less-typing browsing interface with multiple tabs for each browsing session to display the result of query. In the control tab (A) users can control the weight of three features (1) used for a query: visual, text, and time distance features. A time distance slider (2) allows the user to set the time distance between the selected images on ostensive path and the images that

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Figure 1: Ostensive Browser Interface

the system will return to the user: from closest to farthest. For example a user may choose to retrieve images that are near to the present image. The closer the image is, the higher the possibility that images close to this image will be retrieved. Next, the time density bar with a time filter slider (3) is shown using a colour graphic. The colour bar represents a time line of a photo collection. The deeper red the bar is, the greater the density of taken photos, which shows higher significance of Photo LOI (Level of Interest). This technique enables users to see and manipulate visualisations of their photographic activities over time and social space in order to select photos from a particular important period. In the full view tab (B), the detail and descriptions of pictures are shown.

In Figure (1b), a thumbnail object (1) and a grouping interface (2) are shown. A user can use the interface to group images from a selected object based on their similarity or interest. The interface allows the user to see more images in one query. The thumbnail-like object would help the user to envision the object as the group of images. According to our assumptions, the grouping technique allows the user to swiftly discover documents, refine a query and achieve elaborated information search tasks, such as creating a story. Figure (1c) shows the presentation panel (1) and a story interface (3). A user simply drags an object required from a browser panel and drops to the presentation panel. Clicking the play button (1) will start the story animation. The user is able to choose manually to let the system automatically suggest more related images or link other objects in an active/selected path from selected object into the story. The user can also provide the comment or detail of a story.

## 2.2 Story Creation Scenario

A user starts with an original object from either one example random image or the initial image obtained in a pre-keyword search. From search results the user is given the opportunity to choose an image to explore further in order to start the adaptive browsing session or to put into a story. When selecting an image in the browsing panel, a new set of most similar images as candidate objects is then presented to the user. The user clicks on the most appropriate candidate. As a next step, through selecting one of the returned candidates, the user updates the query which is now composed of the original object and the selected object. At this stage, the system presents a new set of similar images by computing its similarity merged with ostensive values computed from implicit feedback from which the user selects images. After a couple of iterations of selection, the query is based on a path of objects. The user can select any images he is satisfied with into

his story. The path represents the user's motion through information, and taken as a whole is used to build up a representation of the instantaneous information need. The user can jump back to a previous object along the path if he gets the feeling that he is stuck or browses in the wrong direction. From there a new path can be explored, starting from the original object to the newly selected object. In one browsing session it could represent one event in an image collection. The user can choose one or more best representative images in that event into a story or create a new session using them related to the next event.

## 3. Conclusion and Future Works

In this poster, we introduced an adaptive browsing approach for supporting the creation of stories. Textual, colour and temporal features are employed to characterise images. A story creation is facilitated by exploiting the implicit feedback captured while a user interacts with the system. We will evaluate the validity of the framework by a task-oriented and user-centred comparative experiment. Moreover, we will verify our assumptions on the possible improvements of the semantic based interaction. Finally, we plan to investigate the user's interaction with personal collections in order to design a new tool for personal photo management which increases the effectiveness of the system.

## 4. Acknowledgements

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