Chapter IX

Advances in Digital Home Photo Albums

Philippe Mulhem, IPAL-CNRS, Singapore

Joo Hwee Lim, Institute for Infocomm Research, Singapore

Wee Kheng Leow, National University of Singapore, Singapore

Mohan S. Kankanhalli, National University of Singapore, Singapore

ABSTRACT

In this chapter, we study the needs of digital home photo albums and the different components that are required to provide effective and efficient computer-based tools to match the users’ expectations for such systems. We focus mainly on indexing and retrieval of photographic images using symbolic descriptions of image contents. We describe how symbolic labeling of image regions can be achieved, how the representation of image content is achieved using two different kinds of representations supporting different needs, and how the retrieval is performed on these image descriptions. Other features of digital home photo management are also described, and our proposal is evaluated on a genuine collection of 2,400 home photographs.
INTRODUCTION

The last few decades have witnessed a dizzying rate of technological innovation in the areas of computing and communication. While the effects of cheaper and faster computation power manifest explicitly in many places, slightly less obvious are the technological advances in sensor and signal processing technologies. Their impact is being increasingly felt in the form of digitization of all forms of communication and media. These advances have directly led to increased inexpensive communication bandwidth, which in turn has spurred the rapid acceleration of the Internet globally. In terms of consumer electronics devices, we are currently witnessing the mass-scale switchover to digital cameras from the traditional analog cameras. In fact, the year 2002 is considered to be a significant milestone since it is the first year when the sales of digital cameras has outstripped those of their analog predecessors.

The history of the invention of the camera is quite interesting. Joseph Nicéphore Niépce and Louis-Jacques Mandé Daguerre’s invention of photography in 1825 was followed by the landmark contributions of George Eastman’s dry photographic film with the associated camera in 1888 and Edwin Land’s instant Polaroid photography in 1948. Essentially, the camera has democratized the preservation of images and, thus, it has had a tremendous impact on society. In the ancient times, only the kings and nobles could afford to engage artists to paint portraits, depict monuments and glorify conquests. With the invention of the camera, even ordinary people’s lives started getting captured visually through this powerful medium. It basically eliminated the need of a skilled intermediary and simultaneously collapsed the time-period between the intent and production of a visual memory. Thus, the camera has been one of the first technological devices to be utilized on a large scale by people that demand neither the mastery of the technology nor the refinement of artistic skills. Hence, it rapidly became a mass-market consumer device. We are at an interesting technological cusp today. On one hand, the falling price of digital devices is rapidly pushing up the sales of digital cameras. On the other hand, increased global affluence coupled with the growing mobility of people is leading to an ever-greater use of the camera. Consequently, a huge amount of digital images is being generated everyday.

We are quite familiar with the traditional paradigm of handling photographs. Analog cameras are used with a film roll that can capture several photos, which are processed at one shot. The output of the rolls used for significant events such as birthdays, weddings, graduation ceremonies and travel are stored in a home photo album. This paradigm of capturing memories strongly resembles the book paradigm and quite easy to use for most people. Though it has some disadvantages in terms of limited use capabilities in terms of making copies or searching by only global album labels, it is a familiar and comfortable approach for most people.

Given that we are undergoing a paradigm shift in terms of camera technology, we can respond to this change in two ways. One way of responding to the challenge of managing large numbers of digital photographs is by faithfully mapping the analog photo album paradigm onto the digital arena, replicating both the look and functionality of the traditional approach. An alternative response would be to totally rethink and completely reengineer the way home users create, store, and manage digital home photo albums.

Thus, with more and more digital photos being accumulated, home users definitely need effective and efficient tools to organize and access their images. To address this
Improving Image Retrieval by Clustering
Dany Gebara and Reda Alhajj (2009). Artificial Intelligence for Maximizing Content Based Image Retrieval (pp. 20-43).
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