Chapter 4

In–Image Advertising

Lusong Li
Beihang University, China

Xian-Sheng Hua
Microsoft Research Asia, China

ABSTRACT

The daunting volumes of images on the Web have become one of the primary sources for online advertising. This work presents a contextual in-image advertising strategy driven by images, which automatically associates relevant ads with an image and seamlessly inserts the ads in the nonintrusive areas within each individual image. In in-image advertising platform, the ads are selected based on not only textual relevance but also visual similarity. The ad insertion positions are detected based on image salience, as well as face detection, to minimize intrusiveness to the user. In addition to general in-image advertising, we also provide a special game-like in-image advertising model dedicated to image on the basis of gaming form, called GameSense, which supports creating a game from an online image and associates relevant ads within the game. We evaluate in-image advertising model on a large-scale real-world images, and demonstrate the effectiveness of in-image advertising platform.

INTRODUCTION

Nowadays we live in a advertising world where advertisements come at us from all directions, such as billboards, print ads, television ads, radio ads, ads on subways and buses. Most of us may probably ignore these ads, because they are not applicable to what we’re doing at the moment we see the advertising. However, online contextual advertising has become an express and effective way for delivering marketing messages to attract customers, because it links advertising to
the information it supports. In another word, online webpage advertising displays text or graphic advertisements that correspond to the content of Web page on which the ad is shown. For example, when a Chinese student is browsing a Web page about English grammar, he or she may need some help to improve his or her English. If there are some ads about English training displayed in the same page, the student may be willing to click the ads to find some English courses provided by the advertisers. Another method is to embed keyword hyperlinks in the page which are sponsored by an advertiser. When users follow the link, they are sent to a sponsor’s website. These advertisements are believed to have a chance of attracting a user, because they may tend to share a similar context as the user’s browsing intention. There usually needs to be an advertising network which connects Web sites (also called publishers) that want to host advertisements with advertisers who want to run advertisements.

Since digital capture devices and community-contributed photo sites have become widely popular, countless images are constantly accumulated in social image-share sites and shared among individuals and community members. Like the large amount of Web pages, the explosive growth of images also brings huge opportunities for advertisers to deliver commercial messages. That’s to say, images can be another powerful information carrier for advertising.

Advertising is a form of communication intended to persuade potential customers to purchase or to consume more product or service of a particular brand. Generally, in the field of advertising, there exist two kinds of advertising, informative advertising and image advertising. Informative advertising is when advertising is carried out in an informative manner. It is a promotional effort at generating interest and credibility in a product, service, or organization by providing consumers with information. For example, alcohol producers run advertisements with the general message being “don’t drive drunk.” As a comparison, image advertising is used for promoting the image, or general perception, of a product or service, rather than promoting its functional attributes. However, being different to the one defined in the field of general advertising, image advertising in this article refers mainly to image-driven advertising. In another word, it uses images as the commercial information carrier. One important point we want to make here is that we focus on the online image advertising which uses web images to carry advertisements, do not discuss the image advertisements which are image banners/rectangles created by advertisers manually that will be laid on a Web page, or product logos/images that will be inserted into a source image or video.

Many existing ad-networks such as Google AdSense, Yahoo! and BritePic, can provide contextual advertising services around images. However, the conventional advertising methods primarily use text content rather than image content to match relevant ads. There is no existing system to automatically monetize the opportunities brought by individual images. As a result, the ads are only generally relevant to the entire Web page rather than specific to images it contained. Moreover, the ads are embedded at a predefined position in a Web page adjacent to the image, which normally destroys the visually appealing appearance and structure of the original web page. It could not grab and monetize users’ attention aroused by these compelling images.

What we want to argue is that the ads should be dynamically embedded at the appropriate positions within each individual image (i.e., in-image) rather than around image like traditional advertising, so that no predefined ad blocks are to be preserved. Furthermore, the ads can also be promoted by the salient appearance of the image. The more compelling the image contents, the more audience will view them, then the more revenue will be generated.

Figure 1 gives an example of in-image advertising. It is observed that an exemplary advertisement (i.e., our ImageSense logo) has been inserted into