Chapter 7

Content and Attention Aware Overlay for Online Video Advertising

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ABSTRACT

Recent proliferation of online video advertising brings new opportunities and challenges to the multimedia community. A successful online video advertising system is expected to have the following essential features: effective targeting, scalability, non-intrusiveness, and attractiveness. While scalable systems with targeting capability are emerging, few have achieved the goal of being both non-intrusive and attractive. To our knowledge, this work is the first attempt to generate video overlay ads that balances the two conflicting characteristics. We achieve the goal by jointly optimizing a non-intrusive metric and a set of metrics associated with video ad templates designed by UI experts. The resulting system is able to dynamically create a video overlay ad that effectively attracts user attention at the least intrusive spatial-temporal spots of a video clip. The system is also designed to enable a scalable business model with effective targeting capabilities, and later will be tested with live traffic on a major video publisher site. In this work, we conducted intensive experiments and user studies on the samples of a large-scale video dataset. The results demonstrate the effectiveness of our approach.

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1 INTRODUCTION

Recently, consumption of online video has grown dramatically. A survey conducted by LiveRail (State of the Industry—LiveRail’s Q4 2008 Review of Online Video Advertising, 2009) in December 2008 shows that, the viewers, especially the valuable 18-24 year old demographic, are increasingly spending more time watching internet-distributed video content than traditional broadcast television. Consequently, the online video advertising market also grows dramatically from $214 million in 2006 to $565 million in 2008, and is expected to reach $1,226 million in 2010 (State of the Industry—LiveRail’s Q4 2008 Review of Online Video Advertising, 2009). This in turn attracts more attention in the research community of online video advertising.

Among the existing advertising formats for online video, four of them are the most popular ones: in-stream (pre/mid/post roll), banner, virtual content insertion (VCI), and overlay ad. In-stream ad (Mei, Hua, Yang, & Li, 2007) is an ad format that inserts an ad video clip before/after the video or in-between with the original video stream stopped. It is a direct copy of the traditional TV-style ad format, used for online business. But this format is intrusive to users because it interrupts the users’ viewing experiences. The banner ad is less intrusive since it is placed around the video. But it is also less attractive and more probable to be avoided by viewers because the viewers are more focusing on the video window. What’s more, both in-stream and banner ad are not suitable for the small and mid-tier advertisers because of the high entry cost of creating the professional ad video clips or ad images. Virtual content insertion (H. Liu, Jiang, Huang, & Xu, 2008) produces impressive results but only works for high quality videos in specific domains such as sports.

Overlay ad is a technology to deliver text ads to online videos by overlaying text information on the video window (see Figure 1 for an example that is a snapshot produced by our system). Recent trend seems to favor overlay ad over the above three ad formats because of its supreme advantages. (1) Overlay ad is scalable to a wide range of advertisers and video content, because it is generated with zero cost for advertisers and applicable to both premium and user generated...
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