

A Keyword Based Video Advertising System

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I. INTRODUCTION

Contextual online advertising is widely used today. As opposed to textual information, the huge amount of video data hardly contributes to the contextual information yet. Mei and Hua [1] therefore see the necessity for “a new advertising generation dedicated to media” and propose a second generation supporting contextual multimedia advertising. They present a system detecting ad insertion points in videos as well as providing multimodal ad matching, first to decrease the intrusiveness and latter to increase the contextual relevance of an ad in audio-visual content.

For our demo we followed the suggestion of Mei and Hua and developed a new advertising system using keyword information extracted from video content. We consider descriptive or strategic keywords for advertisements, which are used to find relevant videos and the position in a video to place the advertisement. Spoken term detection (STD) based on a large vocabulary continuous speech recognition (LVCSR) system provides the content information necessary for our keyword based approach. The system adapts to common standards and architectures for online advertising and enables online selection of contextually relevant ads.

II. SYSTEM DESCRIPTION

The demonstrated video advertising system is embedded into a common content delivery and online advertising concept as shown in Figure 1. A targeting and content analysis module are added to enhance the system’s capabilities with real-time delivery of contextual video ads. In a first step the keywords are defined, while in a second step the content analysis (and retrieval) module of our system provides information about occurrences of these keywords in content videos. Thereby the keywords do not have to directly match the ad (descriptive) but can also be linked on a higher level (strategic) by defining keywords expressing the intention / target group of the advertiser.

The general workflow is as depicted in Figure 1: *Ad Notify* is initiated by the advertising agency after creating a new keyword based campaign. A new keyword entry invokes its query in all indexed video content and an update of the targeting database with asset id and keyword and time information from the query response. *CMS Notify* is initiated by the content provider and starts the analysis and indexing process for a new video based on our LVCSR system [2]. A *Targeting Request* containing the asset id is initiated by a consumer when loading a content video. An ad call with the keywords occurring in the asset is prepared by our system and sent to the ad server. The response of the ad server is enriched with additional targeting information for the ads (timestamps of keyword occurrences) and forwarded to the video client as standard VAST-XML.

Our concept generally allows the connection to many different components with minimal adaptation effort. The actual setup supports the following components: Kaltura video platform¹ (Community

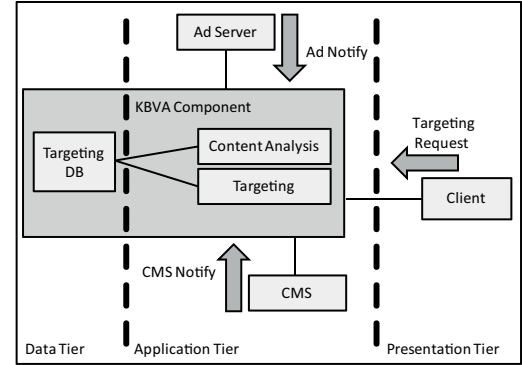


Fig. 1. Overview of our keyword based video advertising (KBVA) system

Edition CE as well as an On-Prem installation hosted by nacamar), OpenX Source Ad Server² and SmartAdServer³, as well as FlowPlayer⁴ in combination with the Open Video Ads (OVA) Plugin⁵.

III. DEMO SCENARIO

For demonstration we realised a non-linear scenario with banner overlays. Banner overlays are presented to the user overlaying parts of the video while the video continues playing. With our keyword targeting approach we can display a banner at exactly the time when a related keyword is spoken in the audio stream of the video content. If, for example, “Paris” is mentioned in a video and an overlay banner for an airline is shown, the ad probably grabs a higher attention and may have a higher relevance than a randomly presented overlay advertising for shoes.

The demonstrated concept of keyword based video advertising is not limited to a certain form of advertisement like non-linear overlays, but could be used to advertise in almost any possible way with linear and non-linear ads (e.g. pre-, mid-, post-roll).

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REFERENCES

- [1] T. Mei and X.-S. Hua, “Contextual internet multimedia advertising,” *Proceedings of the IEEE*, vol. 98, no. 8, pp. 1416–1433, Aug 2010.
- [2] D. Schneider, J. Schon, and S. Eickeler, “Towards large scale vocabulary independent spoken term detection: Advances in the Fraunhofer IAIS Audiomining System,” in *Proceedings of the ACM SIGIR Workshop “Searching Spontaneous Conversational Speech” held at SIGIR ’08*, Singapore, July 2008.

²OpenX Ad Server, <http://openx.org>

³Smart AdServer, <http://www.smartadserver.de>

⁴Flowplayer video player for the web, <http://flowplayer.org>

⁵Open Video Ads Plugin <http://www.longtailvideo.com/open-video-ads>

¹Kaltura Open Source Video Platform, <http://corp.kaltura.org>