Chapter 13
Distributed Technologies for Personalized Advertisement Delivery

Dorothea Tsatsou
Informatics and Telematics Institute, Greece

Symeon Papadopoulos
Informatics and Telematics Institute, Greece

Ioannis Kompatsiaris
Informatics and Telematics Institute, Greece

Paul C. Davis
Motorola Applied Research Center, USA

ABSTRACT

This chapter provides an overview on personalized advertisement delivery paradigms on the web with a focus on the recommendation of advertisements expressed in or accompanied by text. Different methods of online targeted advertising will be examined, while justifying the need for channeling the appropriate ads to the corresponding users. The aim of the work presented here is to illustrate how the semantic representation of ads and user preferences can achieve optimal and unobtrusive ad delivery. We propose a set of distributed technologies that efficiently handles the lack of textual data in ads by enriching ontological knowledge with statistical contextual data in order to classify ads and generic content under a uniform, machine-understandable vocabulary. This classification is used to construct lightweight semantic user profiles, matched with semantic ad descriptions via fuzzy semantic reasoning. A real world user study, as well as an evaluative exploration of framework alternatives validate the system’s effectiveness to produce high quality ad recommendations.

DOI: 10.4018/978-1-60960-189-8.ch013
INTRODUCTION

The vast amount of services and products available on the web and channeled to consumers via online advertisements leads to an inevitable end-side overload problem, which can be alleviated by personalizing advertisement delivery for the consuming audience. Particularly on the web, tracing user preferences and channeling the appropriate ads to users can arguably improve the click-through rate (CTR) of advertisements, as well as the ads’ impact to the user (ChoiceStream, 2008), (Wang et al 2002). However, given the scarcity and brevity of metadata and descriptions available in multimedia advertisements, a significant challenge for such approaches lies in the extraction and filtering of user preferences.

This chapter discusses such challenges in addition to related issues such as the possibility that the data in the advertisements may not directly match the data collected from the user, as a result of different vocabulary usage, and the potential latency and privacy issues posed by storing, handling and transmitting delicate user information. These issues are described in the context of personalized ad recommendation and a set of distributed technologies is proposed to address them.

The solution proposed herein presents techniques to combine semantic knowledge and statistical terminological information unobtrusively extracted from the content a user consumes in order to match and rank advertisements according to the interest score in the semantic profile of the user. A typical usage scenario, portrayed in Figure 1, is as follows: the user consumes a content item (ad, article, annotated video, short text). The textual data of the item are unobtrusively analyzed in order to extract its semantic information, based on predefined domain knowledge. This information consists of a set of user preferences which are captured in the semantic user profile through an automated process. User preferences are then matched semantically to a set of supplied ads in order to identify recommendation possibilities, i.e. whether to recommend an ad and to what degree of confidence is the ad useful to the user. The match confidence degree is used to rank recommended ads to achieve more accurate recommendations.

We present a user study on a real world dataset for the soccer domain which indicates the improvement of real world profile-based recommendations in comparison to simple contextual recommendations. In addition, we detail experimental results, evaluating profile convergence and the effectiveness of recommendations presented to different users for three alternatives of the proposed framework.

The remainder of this chapter is structured as follows. In the next section the background of targeted recommendations is introduced. Following the background section, we next introduce a set of distributed technologies which comprise a framework for ad recommendation. After the presentation of the framework, we present a case study evaluating the performance of the framework for the soccer domain through a real world user study and a set of synthetic experiments. Finally, conclusions on the use of the proposed framework and future work directions are disclosed.
27 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the product’s webpage:

www.igi-global.com/chapter/distributed-technologies-personalized-advertisement-delivery/51963?camid=4v1


www.igi-global.com/e-resources/library-recommendation/?id=19

Related Content

Predictors of Nigeria's Premier University Undergraduate Students' Online Shopping Adoption

www.igi-global.com/article/predictors-of-nigerias-premier-university-undergraduate-students-online-shopping-adoption/207249?camid=4v1a

Nature and Characteristics of the Sport Industry and Its Current Trends Impacting the Industry

www.igi-global.com/chapter/nature-and-characteristics-of-the-sport-industry-and-its-current-trends-impacting-the-industry/199122?camid=4v1a

Content Evaluation Criteria for General Websites: Analysis and Comparison

www.igi-global.com/article/content-evaluation-criteria-general-websites/69976?camid=4v1a

Towards Leadership Marketing: An Exploratory and Empirical Study

www.igi-global.com/chapter/towards-leadership-marketing/123024?camid=4v1a