Promoting Social Media Dissemination of Digital Images Through CBR-Based Tag Recommendation

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Abstract

Multimedia content has become an essential tool to share knowledge, sell products or disseminate messages. Some social networks use multimedia content to promote information and create social communities. In order to increase the impact of the digital content, those images or videos are labeled with different words, denominated tags. In this paper, we propose a recommender system which analyzes multimedia content and suggests tags to maximize its influence in the social community. It implements a Case-Based Reasoning architecture (CBR), which allows to learn from previous tagged content. The system has been evaluated through cross fold validation with a training and validation sets carefully constructed and extracted from Instagram. The results demonstrate that the system can suggest good options to label our image and maximize the influence of the multimedia content.

Keywords

I. Introduction

THE information is the essence of any communication support. The data offered to the individuals provokes a reaction to consume them, either because of its quality, its originality or the way in which it is told. In the particular case of Internet, this issue becomes fundamental for the knowledge sharing. With regard to a digital entity (i.e. a webpage, a social profile or a digital product) it is difficult to achieve the objectives for which it is created when interesting information for its visitors is not present or it is poorly ranked.

As we live in a multimedia world, the information has stopped being limited to a text, but to a mixture of digital objects that allow us to transmit a message. Therefore, text is supported by other visual elements, denominated multimedia content, that serve to draw the attention of our audience. Thus, multimedia content becomes a more attractive alternative for those users who prefer this type of support instead of reading on the website. In this way, the information is mainly based on images and conveys the message we are trying to promote. Furthermore, the continuous increase of users connected to the Web requires new methods to maximize the impact of information dissemination.

In particular, social networks have taken advantage of the power of multimedia content to promote their data. Moreover, some social networks such as Instagram or TikTok have made the multimedia content their essence to survive and expand in the Internet.

Instagram[1] is a social network to upload photos and videos. The users can also apply photographic effects such as filters or frames, add

text, gifs and stickers to their posts or create compilations of several short video fragments. Despite its recent birth in 2010, its concept has been rapidly accepted by the society, and by the end of 2021 it had more than 2 billion active users [1].

Images in many social networks are promoted through the use of tags, which consist of short words that somehow describe the content or the purpose of the picture. Tags are essential for the correct dissemination of multimedia content through the social platform. The tagging of multimedia content to categorize publications by subject matter on the social media is done through the so-called hashtags, so henceforth tags or hashtags will be referred to indistinctly. There are a series of metrics that are calculated based on the interactions of other users with the post (like, share the post, write a comment, save the post...) Thus, the selection of the words to tag the multimedia content becomes essential to augment the visibility of the image and therefore the user. However, despite of different proposals to tag different kind of content [2]–[4] there is no standard method in social networks to know beforehand which words are better to optimize the impact of the image.

In this paper, we present a recommender system that suggests tags to promote a digital image submitted to social networks. In order to improve the performance, the recommender consists of a Case-Based Reasoning (CBR) architecture, which is able to learn from previous experiences to obtain better results in the future. Initially, the memory of the system is previously populated with image features obtained from a set of photos uploaded to Instagram and their associated tags. Then, the system can recommend tags for a particular image manually selected.

For this purpose, the main features of the image are extracted and analyzed. With these features, we obtain a map which is compared with previous images stored in the memory and selected those ones which are applicable due to their similarity. Finally, a set of words are

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[1] https://www.instagram.com/

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