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Automatic quality assessment of native advertisements

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ABSTRACT

Native advertisements are advertisements that closely match the look-and-feel of the publication in which the ads are placed and are an important category of online advertisements. It is important for a publisher to determine whether a given native ad is of high quality and adheres to a stylebook for the publication. Manual evaluation of native ads can be costly, time consuming, and subjective. This disclosure describes use of machine-learning techniques to automatically score a native ad style for aesthetics and conformance to stylebooks. Publishers benefit with the automated quality assessment of a given native ad style and can improve aesthetics and monetization of native ads. Ad-buyers can adjust their bids based on the quality assessment.

KEYWORDS

- Native ad
- In-feed ad
- Content style
- Publication stylebook
- Aesthetic quality
- Online advertising

BACKGROUND

A native ad is a form of advertisement, sponsorship, infomercial, advertorial, or other branded content that follows the natural form of editorial content of a publication. As such, native ads are well-integrated into the publication with a look-and-feel similar to the publication's editorial content, in order to provide an integrative user experiences. Despite the

similarity in look-and-feel, native ads are labeled as advertisements so that they can be distinguished from publisher's editorial content.
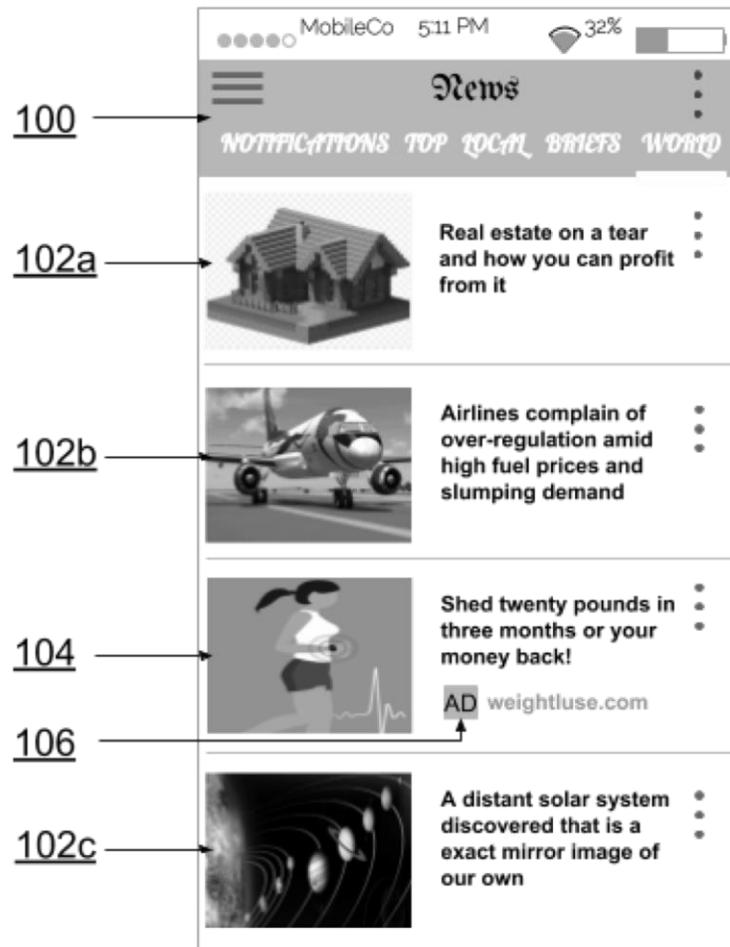
Fig. 1: Example of a native advertisement

An example of a type of native ad is illustrated in Fig. 1. The publication (100) is a fictional example of a general-readership news application or web-site. As such, the style, language, typeset, layout, and look-and-feel parameters of such a publication are controlled, e.g., based on style guidelines and the journalistic traditions of the publication.

Within such controlled look-and-feel setting of a publication, it is possible for an advertiser to place, with the consent of the publisher, an advertisement (104) such that it is similar in appearance to editorial content (102a-c) of the publication. Such an advertisement,

known as "native ad," hews closely to the look-and-feel and language style of the publication. It may appear in the same feed as editorial content (as in the example of Fig. 1), in which case it is also referred to as an in-feed ad. Although appearing within and designed to resemble editorial feed, the native ad is identified as such by a marker (106) that may also provide a link to the advertiser.

Native ads are present in most forms of electronic and print publications, and are tailored to a variety of user-devices, e.g., smartphones, tablets, PCs, etc.

DESCRIPTION

Native ad styles are created by a variety of entities, e.g., the publisher, the advertiser, the ad-network, advertising firms or other third parties, etc. A native ad style is implemented, e.g., as a rendering template that instructs a rendering server to configure and render the native ad assets or elements returned by the advertiser as a full advertisement. While it is straightforward to set up a style for native ads, it is important for publishers to be able to determine whether a given style is of high quality or not, in terms of its aesthetic appeal. However, assessing a style for aesthetics and/or compliance with publisher's stylebook is difficult for humans to do, e.g., due to subjectivity and dependence on human intuition, and the large number of native styles that are presented to a publisher for approval.

This disclosure describes techniques to automatically score the quality of a native ad, with respect to, e.g., its aesthetics, compliance with the publisher's stylebook, etc.
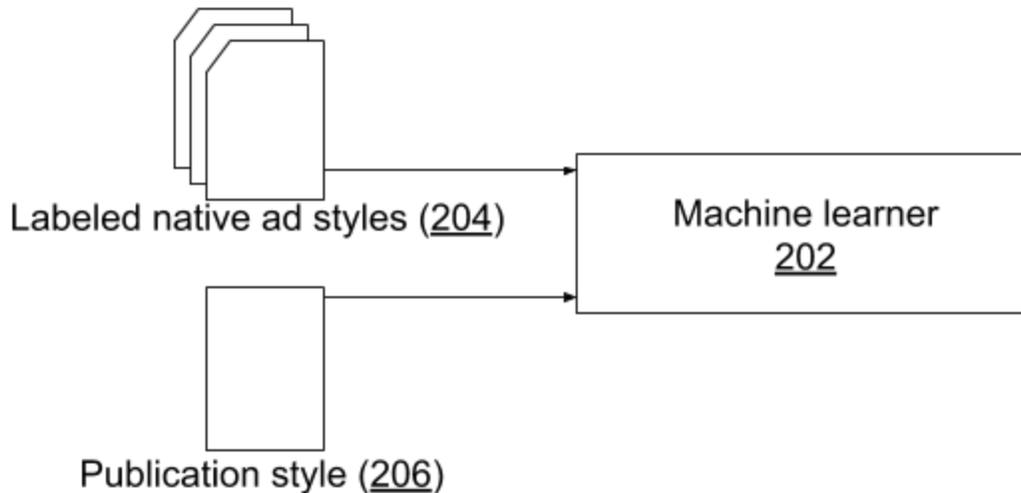
Fig. 2: Training a machine learner to assess native advertisement styles

A machine learner (202), illustrated in Fig. 2, is trained to recognize native ad styles. The machine learner is trained using pairs of labeled native ad styles (204) and publication styles (206) that serve as ground truth data. The training data is labeled, e.g., by humans, by example pages taken from premium publishers or brands, etc. For example, ground truth for high quality styles comprises human-evaluated high-quality image ads, computer-filtered premium image ads based on criteria such as cost per thousand impressions (CPM) or impressions served, etc. Labeled examples of both high-quality and low-quality native ad styles are presented as training data. The model is trained to favor the high-quality styles and/or to detect and flag low-quality styles.

Features used by the machine learner include, e.g., amount and distribution of white space (too little or too much white space leads to low quality); amount and distribution of text, e.g., headline, by-line, text, comments, etc.; amount and distribution of image area; font (e.g., font size, family, color, combinations, etc.); background/foreground color; contrast ratio between text and background (sharp or garish color/contrast lead to low quality); etc. The machine learner evaluates a given style along feature dimensions to classify it. The style score

of native ads also depends on the style of the publication. In this manner, the auto quality scorer learns to score a native style for the aesthetic appeal to end user and compliance to the publisher's stylebook.

The machine learner can be implemented using deep-learning models, e.g., neural networks, support vector machines, random forests, boosted decision trees, etc., or other machine learning models that are effective in learning hard-to-describe human intuition in computer vision and understanding problems. A variety of neural networks may be used, e.g., LSTM neural networks, recurrent neural networks, convolutional neural networks, etc.

The techniques of this disclosure enable several applications, e.g.,

- provide a quality score for publishers to enable easy identification of high-quality styles and to improve low-quality styles

- provide a quality score for publishers in an A/B experiment framework to enable determining connections between the quality of a style and monetization performance

- provide the quality score of publisher styles to buyers to enable ad buyers to adjust their bids using the quality information

- enable publishers to gain insights and optimize styles for monetization and/or aesthetic appeal

- provide in-product native ad style management and recommendation services to publishers

CONCLUSION

Native advertisements are advertisements that closely match the look-and-feel of the publication in which the ads are placed and are an important category of online advertisements. It is important for a publisher to determine whether a given native ad is of high quality and

adheres to a stylebook for the publication. This disclosure describes use of machine-learning techniques to automatically score a native ad style for aesthetics and conformance to stylebooks. Publishers benefit with the automated quality assessment of a given native ad style and can improve aesthetics and monetization of native ads. Ad-buyers can adjust their bids based on the quality assessment.