

Predicting Online Media Effectiveness Based on Smile Responses Gathered Over the Internet

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Abstract—We present an automated method for classifying “liking” and “desire to view again” based on over 1,500 facial responses to media collected over the Internet. This is a very challenging pattern recognition problem that involves robust detection of smile intensities in uncontrolled settings and classification of naturalistic and spontaneous temporal data with large individual differences. We examine the manifold of responses and analyze the false positives and false negatives that result from classification. The results demonstrate the possibility for an ecologically valid, unobtrusive, evaluation of commercial “liking” and “desire to view again”, strong predictors of marketing success, based only on facial responses. The area under the curve for the best “liking” and “desire to view again” classifiers was 0.8 and 0.78 respectively when using a challenging leave-one-commercial-out testing regime. The technique could be employed in personalizing video ads that are presented to people whilst they view programming over the Internet or in copy testing of ads to unobtrusively quantify effectiveness.

I. INTRODUCTION

The face has been shown to communicate discriminative valence information with zygomatic muscle activity greater in commercials with a positive emotional tone and corrugator muscle activity greater in commercials with a negative tone [2]. It has been shown that facial expressions can predict variables related to advertising success, with facial responses correlated with recall [6] and ad “zapping” [18]. The Facial Action Coding System (FACS) [4] is a catalogue of 44 unique action units (AUs) that correspond to each independent movement of the face’s 27 muscles. Computer vision systems can now reliably code many of these actions automatically [22]. In this paper we show that self-reported video advertisement liking and desire to view again can be accurately predicted from automatically detected spontaneous smile (AU12) responses captured in unconstrained settings over the Internet. Figure 1 shows the framework.

Advertisement likability is a key measure of sales success in marketing [5], [15]. It is described as having the dimensions of entertainment, energy, relevance, empathy, irritation and familiarity. However, these metrics are hard to quantify objectively and in many real-life applications self-report measures are impractical to capture (e.g. when people are watching TV). Advertisers wish to increase a viewer’s

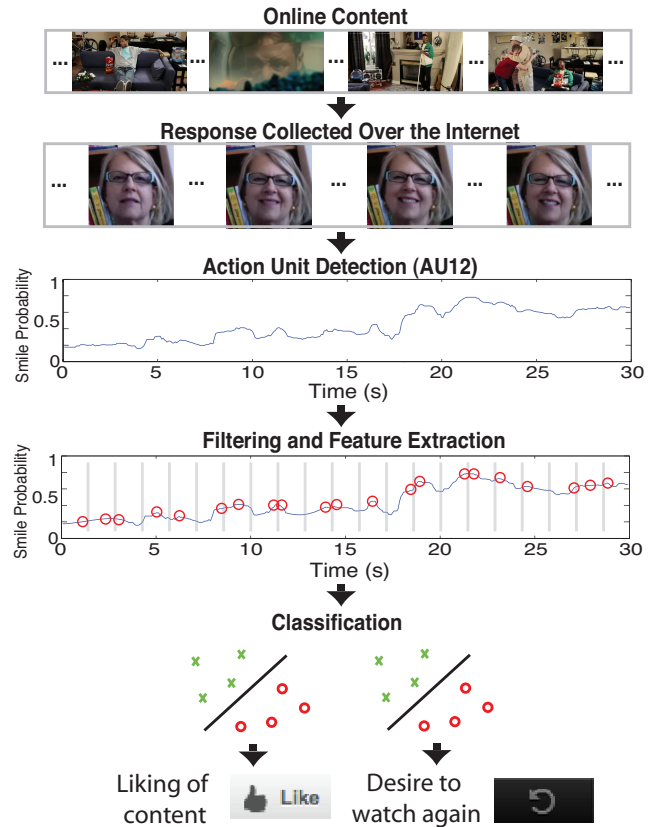


Fig. 1. Framework for classification of content liking and desire to view again based on automatically detected smile responses recorded over the web.

desire to view an advertisement again and desire to view the ad is therefore another measure of advertising effectiveness. Knowledge of likability and desire to view again are not only useful in advertisement copy-testing but could also be used to personalize the content viewers are shown when watching TV over the Internet using platforms such as Netflix or Hulu. In the case of humorous commercials, smile activity is a good measure of positive advertisement attitude or liking, and this can be measured continuously and unobtrusively from video images [10].

Earlier work has shown that facial responses to content can be collected efficiently over the Internet, and that there are significant differences in the aggregate smile responses of groups that report liking a commercial compared to those that report disliking it [11], [12]. Similar difference in the aggregate responses were observed between individuals who

This work was funded by the Media Lab Consortium Members.

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