

Textual Affect Sensing for Computational Advertising

Keywords: textual affect sensing, semantic similarity, computational advertising

Introduction

The creation of advertising headlines is a deep process of creative writing production. As far as the textual content is concerned, there are not many computational tools (besides the usual dictionaries, thesauri or program for performing of simple wordplays) that help the copywriter activity. Therefore it is interesting to explore the use of natural language processing techniques for proposing solutions to advertising professionals and improving the quality of advertising messages, opening up the way to a full automatization of the whole process of creative writing production.

To this aim we implemented a strategy for the creative variation of familiar expressions. With “varied familiar expression” we indicate an expression (sentence or phrase) that is obtained as a linguistic change (e.g. substitution of a word, morphological or phonetic variation, etc.) of an expression recognized as familiar by recipients (e.g. selected by some collection of proverbs, famous movie titles, etc.). In this work we limited the variation to the word substitution. Varying familiar expressions (proverbs, movie titles, famous citations, etc.) in an evocative way has been an effective technique in advertising for a long time. A lot of efforts by professionals in the field goes into producing ever novel catchy expressions with some element of humor.

Lexical Selection and Affective Weight

All words can potentially convey affective meaning. Each of them, even those more apparently neutral, can evoke pleasant or painful experiences. While some words have emotional meaning with respect to the individual story, for many others the affective power is part of the collective imagination (e.g. words “mum”, “ghost”, “war” etc.). We are interested in this second group, because their affective meaning is part of common sense knowledge and can be detected in the linguistic usage. For this reason, we studied the use of words in textual productions, and in particular their co-occurrences with the words in which the affective meaning is explicit. We have to distinguish between words directly referring to

emotional states (e.g. “fear”, “cheerful”) and those having only an indirect reference that depends on the context (e.g. words that indicate possible emotional causes as “killer” or emotional responses as “cry”). We call the former *direct affective words* and the latter *indirect affective words*.

In order to manage affective lexical meaning, we implemented a selection function (named *affective weight*) based on WORDNET-AFFECT, an affective lexical resource consisting of an extension of WORDNET, and a semantic similarity mechanism automatically acquired in an unsupervised way from a large corpus of texts (100 millions of words). The affective weight function allows us to perform the affect sensing of a generic term.

Creative Variations of Headlines

Advertising messages tend to be quite short but, at the same time, rich of emotional meaning and persuasive power. An advertising message induces in the recipient a positive (or negative) attitude toward the subject to advertise, for example through the evocation of a appropriate emotion. Another mandatory characteristic of an advertisement is its memorizability. These two aspects of an ads increase the probability to induce some wanted behaviours, for example the purchase of some product, the choice of a specific brand, or the click on some specific web link. In the last case, it is crucial to make the recipient curious about the subject referred by the URL. The best way to realize in an ads both attitude induction and memorizability is the generation of surprise, generally based on creative constraints.

In order to develop a strategy for surprise induction, we considered an interesting property of pleasurable creative communication known as the *optimal innovation hypothesis*. According to this assumption, when the novelty is in a complementary relation to salience (familiarity), it is “optimal” in the sense that it has an aesthetics value and “induce the most pleasing effect”. Therefore the simultaneous presence of novelty and familiarity makes the message potentially surprising, because this combination allows the recipient’s mind to oscillate between what is known and what is different from usual. For this reasons, an advertising message must be original but, at the same time, connected to what is familiar. Familiarity causes expectations, while novelty violates them, and finally surprise arises. Moreover, a successful message should have a semantic connection with

some concept of the target topic. At the same time, it has to be semantically related with some emotion of a prefixed valence (e.g. positive emotion as *joy* or negative emotion as *fear*).

In order to perform the automated generation of varied familiar expression, we implemented an algorithm that gets in input a set of familiar expressions (in particular, proverbs and movie titles) and, for each of them, generates all possible variations. The list of varied expressions is ordered according to the global affective weight. Using the affective weight function, it is possible to check for their affective characterization, selecting those affectively coherent with the input term. Subsequently, the system searches for assonant words and checks for affective opposition with the original words. At this point, the system retrieves familiar expressions that include the word to be substituted. Table ?? shows the final word substitution in some examples.

Varied Expression	Word Substitution
Tomorrow is another bay	day → bay
Back to the Suture	future → suture
Thoracic Park	jurassic → thoracic
Fatal Extraction	attraction → extraction
Saturday Fright Fever	night → fright
Jurassic Dark	park → dark

Table 1: Examples