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Reverse Engineering Humor

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Reverse Engineering Humor

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Heuristic and validating experiments concerning computational selection and recognition of words that lead to humorous wordplay in a set of jokes are reviewed. The experiments were not designed to classify jokes and non-jokes. Instead, all texts were known to be jokes based on wordplay. The task was to find the words that lead to wordplay, and recognizing resulting wordplay. The term "reverse engineering" is used "tongue and cheek" to describe this project's deconstruction of already established jokes.

The jokes were selected from Kostick et al (1998). Jokes were sequentially read by a human until those matching the desired number and characteristic were found.

Usually jokes have a setup and a punchline. The setup creates expectations, the punchline violates them, leading to a different interpretation of the setup (Ritchie, 1999).

Each wordplay joke contains a (source, target) pair of words. The source is an utterance in the joke; the source conflicts with the perceiver's initial interpretation. The target is an utterance that sounds similar to the source. The similarity in pronunciation between the source and the target, in addition to the conflict with the initial interpretation, leads to discovery of a second interpretation of the text. For example, consider (Kostick et al, 1998):

Rich: How was your date?
Mitch: Terrible! She didn't smile once all night!
Rich: Poker face, eh?
Mitch: No, but I wanted to.

The (source, target) pair is (poker, poke her).

In our experiments, all the words in the jokes are rated with familiarity values (Wilson, 1987) and Kučera-Francis (KF) frequency (1967).

The first experiment was conducted to decrease the search space of target source pairs. The two hypotheses were: the source of the joke has a lower familiarity value than the median familiarity value of all words in the joke; the source of the joke has a lower KF frequency value than the median KF value of the joke. The hypotheses were tested on a set of 50 short jokes of different length (10 words – 38 words). Words with unknown familiarity or KF frequency value were included with a corresponding value of 0. The results were: the source of the joke had a lower familiarity value than the median familiarity in 48 jokes out of 50; the source of the joke had a lower KF frequency than the median in 49 jokes out of 50. Combining the hypotheses reduced the overall source search space in 50 jokes by 50.79%.

The source is usually positioned closer to the end of the joke. Thus, our source search starts from the last word of the joke, and moves towards the first word. This method reduced the search space by 86.69%. The addition of heuristic function that incorporated results of the first experiment reduced the search space by an additional 0.78%. While this number seems small, it substantially decreases search space with the increase of text length.

Once the source is chosen, targets are generated using phoneme substitution. The phonemes to be substituted are chosen taking into account cost (Hemplemann, 2003) and confusion (Frisch, 1996) metrics. The resulting utterances are used as target candidates.

To find a heuristic function of word selection that leads to the desired (source, pair), we looked at the relationship between familiarity and KF frequency of words that lead to humor. A sample of 1182 target pun pairs was taken from Hempelmann (2003). The values for familiarity and KF frequency of words were taken from MRC Psycholinguistic Database. Since familiarity and KF frequency values are only available for single words, puns where the target or source consisted of more than one word were discarded. Additionally, puns with unknown values of familiarity or KF frequency for target or source were discarded. The results showed: (1) the familiarity value of the source is at least 5% lower than the corresponding familiarity value of the target in 56% of the data; (2) the KF frequency value for the source is at least 10% lower than the corresponding KF frequency value for the target in 71% of the data.

The addition of the higher familiarity and frequency selection condition further narrows the choices for target selection for each source.

In summary, the presented results are useful for computational humor recognizers. Regardless of the nature of the recognizer (ontologically-, statistically-, etc based), analyzing each word of a joke takes too long. The presented research takes advantage of the joke's structure in relation to familiarity and KF frequency values to apply the recognizers resources in the most efficient manner.

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