

Metaphor and Affect Detection in an ICA

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Abstract. We discuss an aspect of an affect-detection system used in edrama by intelligent conversational agents, namely affective interpretation of limited sorts of metaphorical utterance. We discuss how these metaphorical utterances are recognized and how they are analysed and their affective content determined.

1 Introduction

In [1], we described a system for text-based, on-line, improvisational, role-playing (*e-Drama*) containing an ICA, EMMA (EMotion, Metaphor and Affect), that plays a minor character and uses NLP techniques to extract affect (i.e. emotions/moods e.g. embarrassment, hostility and evaluations of goodness, importance, etc) from the other characters' utterances in order to make largely content-free, but affectively sensitive, responses. Although metaphor was noted as major conveyer of affect in edrama and generally (see [2]), analysing it for affect was not fully investigated nor implemented. We now report a start, with the implementation of certain types of metaphor analysis.

2 Processing Metaphor for Affect

Metaphor has been largely ignored by ICA research and there are few computational treatments elsewhere (c.f. [3]). We describe here the processing of two limited but important types of metaphorical phenomena found in edrama transcripts.

1) Casting someone as either: a special type of human without claiming literal truth (e.g. 'you baby,' 'you freak'); or a monster, mythical or supernatural creature, etc. (e.g. 'Lisa is an angel'); or an animal. Note, the latter often conveys affect -negative or positive- but interestingly the young form ('piglet', 'pup' etc.) may be affectionate, even when the adult form is negative. EMMA deals with cases with a conventional metaphorical sense but also with those without one, for one might still determine a particular affective sense, e.g. from the young form, or size. The latter is because of:

2) The metaphorical use of size adjectives. 'A little X' often conveys affective qualities of X such as unimportance and contemptibility, but may convey affection, even if the X is usually negative as in 'little devils' for children. 'Big X' can convey the importance of X ('big event') or intensity of X-ness ('big bully'). See [4].

Our approach splits processing into two: (A) recognition of potential metaphors and (B) analysis of recognised elements to determine affect. The basis for (A) is a list of phrases and syntactic structures, observed in edrama scripts and elsewhere, which

often include metaphors or have metaphors as collocates. We currently focus on three syntactic structures, 'X is/are a Y', 'You Y' and 'like [a] Y' and on the lexical strings, 'a bit of a', 'such a' and 'look[s] like'. These structures/phrases are found by parsing the actors' utterances for Grammatical Relations (GR) using the RASP parser.

Once the (X and) Y nouns have been recognised, WordNet is used to analyse them, checking for example whether Y is a kind of animal. In simple cases (e.g. with 'cow') Y has an alternative sense (or synset) as an 'unpleasant person'. However, 'person' senses are not always found, in which case Y is still marked as a metaphor but the affect labelled 'positive or negative'. Further processing may determine which. We illustrate here the process with examples (1) 'Lisa is an angel' and (2) 'You piglet'.

- 1a. The metaphor detector recognises the 'X is a Y' signal, with the 'Y' as 'angel'.
- 1b. The metaphor analyser finds that 'angel' is a hyponym of 'supernatural being'.
- 1c. It finds that for another synset the word is a hyponym of 'person'.
- 1d. The hypernym tree of the 'person' synset also passes through 'good person' which expresses positive affect and the metaphor is labelled as positive.
- 1e. The metaphor is labelled as a supernatural being metaphor that is positive.
- 2a. The metaphor detector recognises the 'You Y' signal with 'Y' as 'piglet'.
- 2b. The metaphor analyser detects 'piglet' is a hyponym of 'animal'.
- 2c. 'Piglet' has no alternative synset with 'person' as a hypernym. So the analyser retrieves its gloss from WordNet.
- 2d. It finds 'young' in the gloss and retrieves all of the words that follow it. In this example the gloss is 'a young pig' so 'pig' is the only following word.
- 2e. The analysis process is repeated for each of the words captured from the gloss and the metaphor labelled with the appropriate polarity.
- 2f. This example would result in the metaphor being labelled as an animal metaphor which is negative but affectionate with the affection label having a higher numerical confidence weighting than the negative label.

Other analyses involve checking and comparing the hypernym trees of both X and Y.

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