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Functional Disambiguation Based on the Syntactic Structures Algorithm for Spanish Language

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Abstract. This article presents a disambiguation method that diminishes the functional combinations of the words of a sentence taking into account the context in which they appear. This process uses an algorithm which does the syntactic analysis of every sentence interpretation. In order to control this analysis, a grammar with restrictions has been developed to model the valid syntactic structures of the Spanish language. The main target of our algorithm is the separation between the disambiguation method and the grammar which governs it.

Keywords: functional disambiguation, syntactic analysis, Computational Linguistics, Natural Language Processing

1 Introduction

One of the principal problems that is necessary to face when one tries to approach the automated analysis of texts in Spanish, is the high quantity of combinations that emerge due to the degree of ambiguity of the words that configure the language. The fact that a great quantity of words could play multiple grammatical functions causes an enormous number of interpretations within the sentence.

In order to minimize this problem, it has been developed an algorithm which, starting from a grammar of entry and from a morphologic analyzer, carries out a disambiguation process based on the syntactic analysis of each one of the combinations of the sentence. Consequently, the main objective will be the reduction of the number of interpretations through the study of syntactic structures and the obtention of the syntactic analysis trees of the sentence.

Furthermore, it has been developed an algorithm which works independently to the rules of the grammar, in order to provide an easy maintainability tool that could be used by linguistics users non-experts in the computing field.

2 Functional Disambiguation by Syntactic Analysis Algorithm

Taking into account the different functional categories of the words that compose a sentence, returned by a morphologic analyzer, it proceeded to reject those that do not satisfy the syntactic restrictions specified in the grammar of entry.

The disambiguation algorithm would try to do the syntactic analysis of each combination. Thus, it will reduce the number of interpretations to only those with which there is obtained at least a tree of valid analysis

3 Results

The developed algorithm has been tested over a group of 7000 representative Spanish sentences. The overall results were these:

Table 1. Overall results

Overall results	
Number of initial combinations	205,69
Number of final combinations	3,65
Disambiguation percentage (%)	86,63
Number of syntax trees	14,97
Number of nodes	19155,17
Number of useful nodes	123,15
Disambiguation time (sec.)	4,73
Total time (sec.)	4,87

4 Conclusions

In conclusion, the present article exposes a method capable of carrying out the functional disambiguation by means of the use of the Syntactic Analysis, being based exclusively on the grammatical structures codified as external rules. With all, it is obtained a high percentage of disambiguation in a reasonable time of execution, and moreover, a totally independent operation from the input grammar.

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