

Natural language processing course: Paraphrasing

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Abstract

The final report will contain the abstract. The abstract goes here. The abstract goes here.

Keywords

Paraphrasing, Translation

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Introduction

We decided to work on the third project type of the Natural Language Processing course, namely paraphrasing sentences. Paraphrasing sentences is an important aspect of language processing, especially in machine translation, text summarisation, extracting information from text, answering questions and in syntactic and semantic analysis of sentences and parsing. Although various methods have been used in the past for paraphrasing sentences, the use of artificial neural networks has recently been on the rise, as in many areas of machine learning and artificial intelligence. We intend to approach the task ourselves by means of translation, where, by translating a sentence into an intermediate language and back into the original language, we obtain different sentences which, if translated correctly, should retain the same meaning. Such machine paraphrasing, when compared with human paraphrasing, is usually less accurate in terms of similarity of meaning, but it is much faster and cheaper, and usually results in a more varied vocabulary, especially if the intermediate language is from another language group and there is a sufficiently large pool of texts.

Methods

First of all, we would take a suitable amount of sentences for paraphrasing from the ccGigafida corpus. For simplicity, we would focus on sentences containing between 5 and 20 words, clean them up, separate them and turn them into lower case. The sentences would then be translated using the Clarin

translator, some of them used for learning and some for testing the model.

Once we have a suitable base, we would try to learn one of the autoregressive models for paraphrasing Slovene sentences. In our opinion, an autoregressive model would be better for such a task, as it also takes into account the context of the sentence and does not only translate single words.

Both in the translation of the sentences and in the evaluation of the resulting model, we would try to assess:

- 1. The distance or similarity between the original and the translated sentence
- 2. How many words are different between the translated and the original sentence
- 3. Syntactic correctness of the translated sentence
- 4. We would also try to manually assess how the translated sentence sounds on a given sample.

When evaluating the resulting model, we would try to add the following metrics:

- 1. BLEU
- 2. METEOR
- 3. ParaScore

BLEU

Basic metric, made for machine translation, measures the similarity between machine and human translated sentences. One of the standard measures. [1]

METEOR

Addresses some of the shortcomings of BLEU. [2]

ParaScore

The assessment takes into account both the semantic similarity between the words and the lexical variety (as similar a meaning as possible and as different words as possible). [3]

CLARIN

Common Language Resources and Technology Infrastructure, Slovenia CLARIN.SI is the Slovenian national consortium of the European research infrastructure network CLARIN. It provides language resources and technologies. We will use it for translation between English and Slovene.

https://www.clarin.si/repository/xmlui/handle/11356/1736 https://github.com/clarinsi/Slovene_NMT

Existing solutions

Writing assistants: https://instatext.io/

Paraphrasing sentences is used for:

- plagiarism checking
- to avoid plagiarism by changing sentences that sound too similar
- text summarization
- simplifying the text when the text is too complex or technically demanding, part of the text can be changed to make it more understandable
- machine translation
- to optimise the content of a website (SEO Search Engine Optimisation) so that it is easier for search engines to find it or rank it higher in search results

Some web applications:

- Prepostseo https://www.prepostseo.com/paraphrasing-tool Has the feature to manually add synonyms.
- QuillBot https://quillbot.com/
- SpinBot https://www.spinbot.com/ Actually redirects to Quill-Bot
- AI Article Spinner https://aiarticlespinner.co/
- Small SEO Tools https://smallseotools.com/paraphrasing-tool/ (not free)

Short comparison

Original text: (https://www.bbc.com/news/world-europe-64935449): *Analysts say Bakhmut has little strategic value, but has become a focal point for Russian commanders who have struggled to deliver any positive news to the Kremlin.*

- **Prepostseo standard:** Analysts say Bakhmut has little strategic value but has become a flashpoint for Russian commanders struggling to get positive messages across to the Kremlin.
- Prepostseo fluency: Analysts say Bakhmut has little strategic value but has become a focal point for Russian commanders who have struggled to relay positive messages to the Kremlin.
- QuillBot: Despite having minimal strategic worth, according to analysts, Bakhmut has become a focus for Russian commanders who have found it difficult to bring any good news to the Kremlin.
- AI Article Spinner standard: Analysts say Bakhmut has little strategic value, but he has become a focal point for Russian commanders who have struggled to deliver positive news to the Kremlin.
- AI Article Spinner standard: Analysts say Bakhmut has little strategic value, but has become a focal point for Russian commanders struggling to convey good news to the Kremlin.

References

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