**Title: The research of relationships between sentences in nlp**

**Abstract:**

The traditonal way to process natural language is cutting a document to many seperate sentences, and abstracting the information we need from these sentences. However, this way ignores the relationships between sentences, where much information can still be abstracted. This article is mainly to propose some feasible ways to define and differentiate sentences relationships, and present some applications which can be used with these relationships in natural languages processing.

**Definition of sentences relitionships (english & chinese corpus)**

English, 9 in total:

Addition, clarification, comparison , contrast , exemplification or example, location or spatial order, cause / effect or condition / conclusion, summary , time

Chinese, 10 in total:

并列关系、承接关系、递进关系、选择关系、转折关系、假设关系、因果关系、条件关系、解说关系、目的关系

**Differentiating sentences relationships by conjunction(english corpus)**

Addition

Again, also, and, besides, finally, further, last, moreover, equally important, furthermore, in addition, likewise

Clarification

As a matter of fact, clearly, evidently, in fact, too, obviously, in other words, of course

Comparison

Also, likewise, in like manner, similarly, both/and

Contrast

After all, although, conversely, at the same time, however, but, for all that, still, in spite of, yet, nevertheless, in contrast, on the contrary, on the one hand, on the other hand, notwithstanding

Exemplification or example

For example, for instance, that is, thus, including

Location or spatial order

Above, adjacent to, below, beyond, close by, elsewhere, inside, nearby, next to, opposite, within, without

Cause / effect or condition / conclusion

Accordingly, as a result, because, then, hence, in short, consequently, thus, therefore

Summary

In brief, in conclusion, in short, to sum up, on the whole, to summarize

Time

After, after a short time, afterward, before, during, of late, at last, at that time, immediately, formerly, while, presently, since, shortly, now, thereupon, until, temporarily

**Applications:**

1, sentences' weight in semantic extraction

The same word in different sentences should have different importance to the comprehension to the whole paragraph, and this can be addressed by add weight for each sentences before word vector representation.

How to quantize the weight is based on the relationships defined before.

2, nominalization

Convert implicit words into explicit nouns, such as pronoun.

3, timeline-issue visualization

According the time conjunctions, list all the issues or process in order of time.

This can be used in criminal case analyse, listing all the issues and find some points of contradiction. And this can also be used in making food, listing the time and order of each step.

More applications are ongoing to be found......

**Reference:**

1, explicit / implicit relationships within and between sentences

[Http://www.mdc.edu/kendall/collegeprep/documents2/explicit%20implicit%20relationships%20within%20between%20sentences.pdf](http://www.mdc.edu/kendall/collegeprep/documents2/Explicit%20Implicit%20relationships%20within%20between%20sentences.pdf)