

## Paper Critique

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Singhal, Amit and Fernando Pereira. 1999. "Document Expansion for Speech Retrieval," in *Proceedings of the 22nd Annual Interantional ACM-SIGIR Conference on Research and Development in Information Retrieval*, Berkeley

### Overview

#### 1. What's the paper about?

This paper shows that document expansion can be successfully used to alleviate the effect of transcription mistakes on speech retrieval. The paper first gave us a basic idea of what's speech retrieval is about, why it is important and what new problems it has compared to traditional IR. The author addressed the difference between speech retrieval and retrieval from OCR based on the type of errors an ASR system made and an OCR system made. Then the author pointed out the main problem in doing word and phrase based speech retrieval is due to poor index term assignment for ASR transcriptions.

The author discussed the "aboutness" of a document and believes that the concept, instead of just the words appearing in a speech documents should be used when we are indexing the speech transcription. One way to do this is to create a domain related thesauri to enhance the set of index terms assigned to documents, but this is quite expensive. Another way is to reweigh and add new terms to the original document which is shown in details in this paper.

The author then described the experiment set up, they use 2866 documents and 19 queries to perform the speech retrieval. 8 speech recognizers with different WER are used during the experiment. The author described in detail how the documents are expanded and tuned the parameters to optimize the Average Precision. Then the author analyzed the result of the document expansion.

#### 2. What are the contributions?

This paper proposed an original idea to index the speech documents by reweighing existing terms and adding new terms to the original document. This is done by clustering documents and the term reweighing and adding based on the terms used in other documents in the same cluster.

#### 3. What's the main line of the argument in the paper?

The author addressed the importance of using the "aboutness" to index the speech documents and argues that document expansion by term reweighing and adding can significantly improve the effectiveness of speech transcriptions especially when the speech transcriptions WER is high (but not 100%) and when the query is short.

### Significance and originality

**1. Were the ideas novel or original at the time?**

Yes.

**2. Are the contributions significant?**

Based on the experimental results, the author drew a conclusion that the document expansion they used has significance. But one big problem in the experiment design is that the training data used for tuning the parameters (alfa and degrees of expansion) and the test data is the same. So we can not tell if the method proposed has the same significance when we test on other data.

**3. What's the advantages and limitation of the approach?**

Advantages: The author used 8 different speech recognizers.

The author analyzed the effectiveness of reweighing terms and adding new terms separately.

Limitations: Used only 19 queries which is not sufficient.

Used only 2800 documents, which is not sufficient.

## Soundness

**1. Were the ideas that were presented technically correct?**

The idea is sound, but there are severe problems when they were performing the experiment.

## Empirical Evaluation

**1. Are the ideas evaluated using a study design that is appropriate for questions that the authors wished to answer?**

Yes.

## Related Work

**1. Is the paper properly situated with respect to related work?**

Yes.

## Readability

**1. Is the paper well structured?**

Yes.

**2. Is the paper well written?**

The paper is well written. I think some basic concepts should be readdressed during the discussion in this paper, like WER, AP etc.