# auto-hMDS: Automatic Construction of a Large Heterogeneous Multilingual Multi-Document Summarization Corpus

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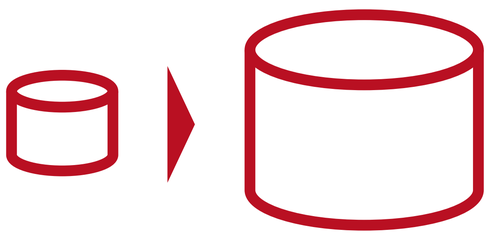
## auto-hMDS in a nutshell

- lack of large multi-document summarization corpora limits training and evaluation of machine learning models
- large corpora are expensive to create
- automatically create large, multilingual MDS corpora
- retrieve auto-hMDS corpus: `github.com/AIPHES/auto-hMDS`

## Problem

### Machine learning requires large datasets

**image classification 2014:**
GoogLeNet trained on 1.5 million images



**machine translation 2017:**
DeepL trained on over 1 billion translations

**single-document summarization:**
CNN/DailyMail corpus → abstractive summarization

### Reliable evaluation requires large datasets

- evaluation with ROUGE is noisy
- ROUGE preference prediction correct in approx. 65%
- requires more data points to be reliable

A > B ?

### Large MDS corpora are not available

Available MDS datasets are
- small: DUC/TAC contain only up to 50 topics
- written only in English
- contain only newswire topics + documents

## Solution

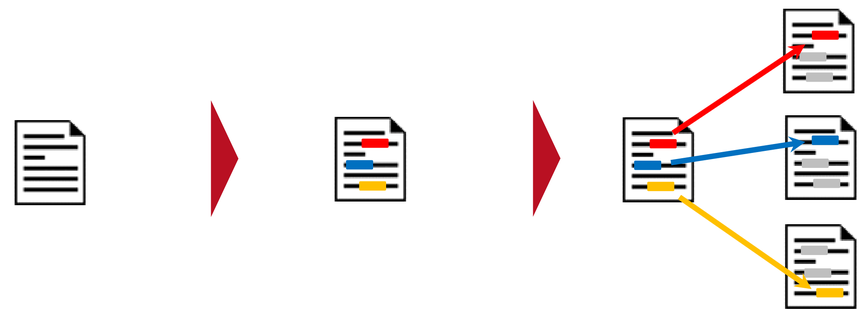
### Traditional Corpus Construction

1 search source documents for topic
2 identify important information
3 write proper summaries

1. finding/reading source documents is time consuming
2. importance estimation requires domain knowledge
3. professional writers required to achieve high quality

→ **time-consuming, complex and expensive**
→ **leads to small corpora**

### Reversing Traditional Corpus Construction



1 select existing summary
2 mark information nuggets
3 retrieve source documents

1. no text to write → cheap
2. importance of information already assessed
3. summaries = common opinion

prior work performed 2 and 3 manually to build hMDS
→ **created hMDS corpus still rather small**

**perform 2 and 3 automatically:**

**search one source document for every sentence in the summary**

## Analysis

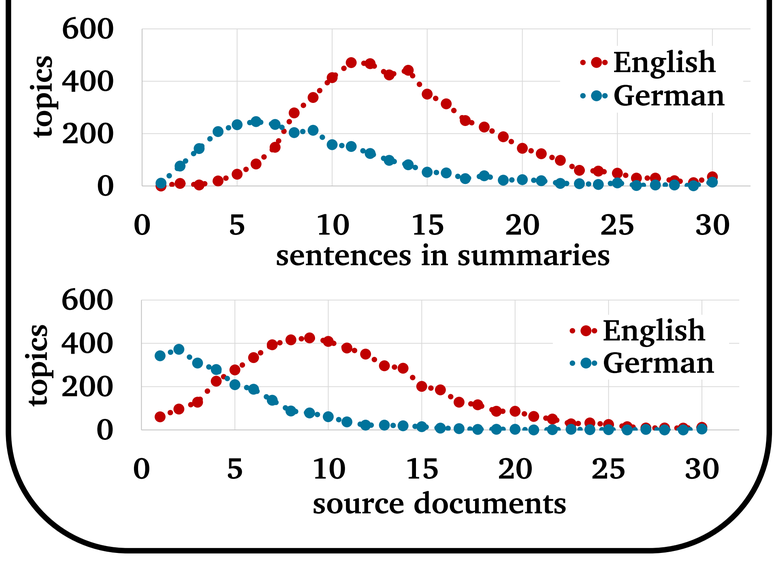
### Corpus Size

| Corpus | Topics | Source Documents |
|---|---|---|
| DUC 2004 | 50 | 500 |
| TAC 2009 | 44 | 440 |
| hMDS | 91 | 1,265 |
| auto-hMDS | **7,316** | **64,744** |

| Corpus | Sentences | | Tokens | |
|---|---|---|---|---|
| | source | sum | source | sum |
| DUC 2004 | 26.28 | 6.61 | 672.15 | 118.12 |
| TAC 2009 | 24.58 | 6.16 | 633.89 | 110.15 |
| hMDS | 268.15 | 9.05 | 2972.12 | 245.52 |
| auto-hMDS | **271.36** | **12.54** | **5862.51** | **312.42** |

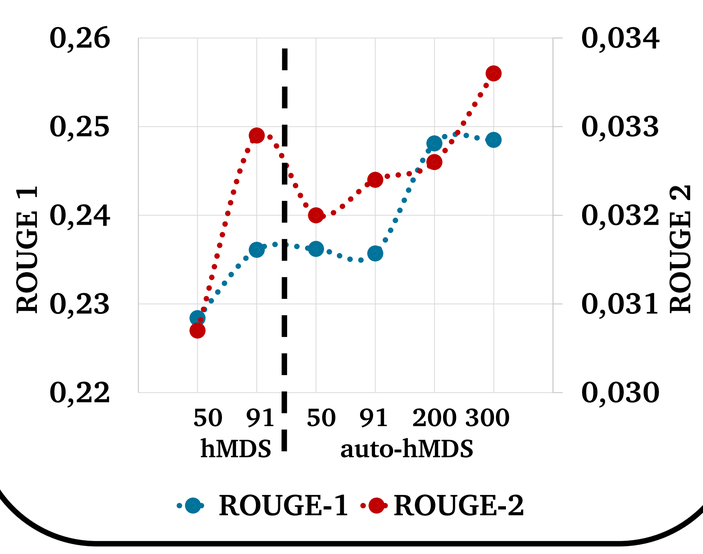
### Corpus Heterogeneity

- **broad variety of different topics**
- **topics in English and German**




### Training Data

- training on (auto-)hMDS
- evaluation on TAC 2009

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