Heterogeneous Queries for Synoptic and Phrasal Search

Šimon Suchomel, and Michal Brandejs

Faculty of Informatics, Masaryk University, Brno, Czech Republic

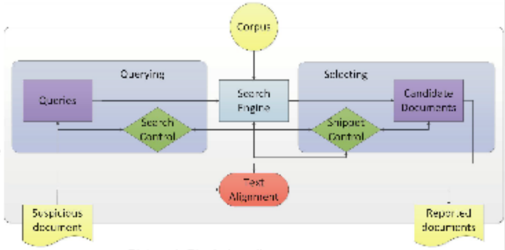
Introduction

Main presumptions

- Queries are the most expensive.
- Downloads are cheap.
- Single-themed documents.
- What is the minimum copied unit?
  - words, sentences, paragraphs

Methodology

- Retrieve theme-similar documents.
- Retrieve documents with the same text according to chosen chunking method.
- Proceed iteratively over queries.



Picture 1: Plagiarism discovery process.

Building of the Queries

Keywords

Query	Source	Position interval	
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geometry textbook world	phrase:Collocation		
parallel postulate line angle proof euclidean	Collocation		
geometry textbook world mathematician work obtuse	Collocation		
equal point volumes assumption publish haytham	KW		
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Paragraphs

- Lemmatization; stop-words removal;
- TF-IDF scoring for keywords;
- from top 3 KW, there were collocations extracted;
- longest collocations form phrasal queries;
- 6 tokens long queries.

- Longest sentence from each paragraph;
- no stop-words removal;
- 6 tokens long phrasal queries;
- postitional queries.

Chat Noir

- pilot query
- non-phrasal queries

Indri

- pilot query
- phrasal queries

Snippet

More than 1 per result.

- for each document query
- 2-tuples measurement
- 20% concordance for download

Downloading and post-processing

Post-processing

The system uses the same basic principles as in PAN 2013.

- Common features between source and suspicious documents;
  - word 5-grams;
  - stop-word 8-grams.
- Alternative features;
  - contextual n-grams;
  - plain word 4-grams.
- Overplapping detection removal.

Tuned for text alignment task, which is surprisingly not ideal for source retrieval task.

In the post-processing phase a similarity between the suspicious and the source document was calculated. If any similarity was detected, the suspicious document were reported as a potential source of plagiarism.

CLEF 2014, 15-18 September 2014, Sheffield, UK

Conclusion

- There is no optimal chunking method – without computation of text characteristics.
- The keywords-based queries are possibly the most profitable.

Contact information:
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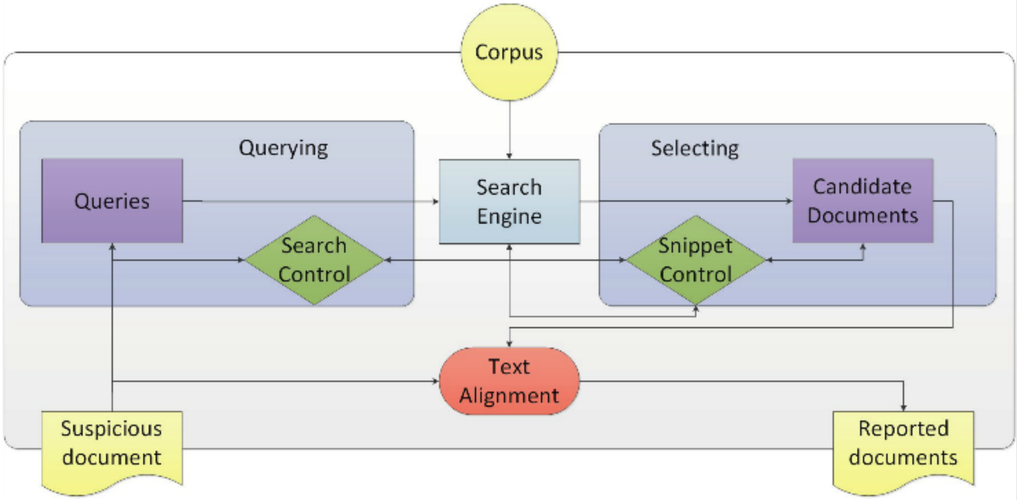

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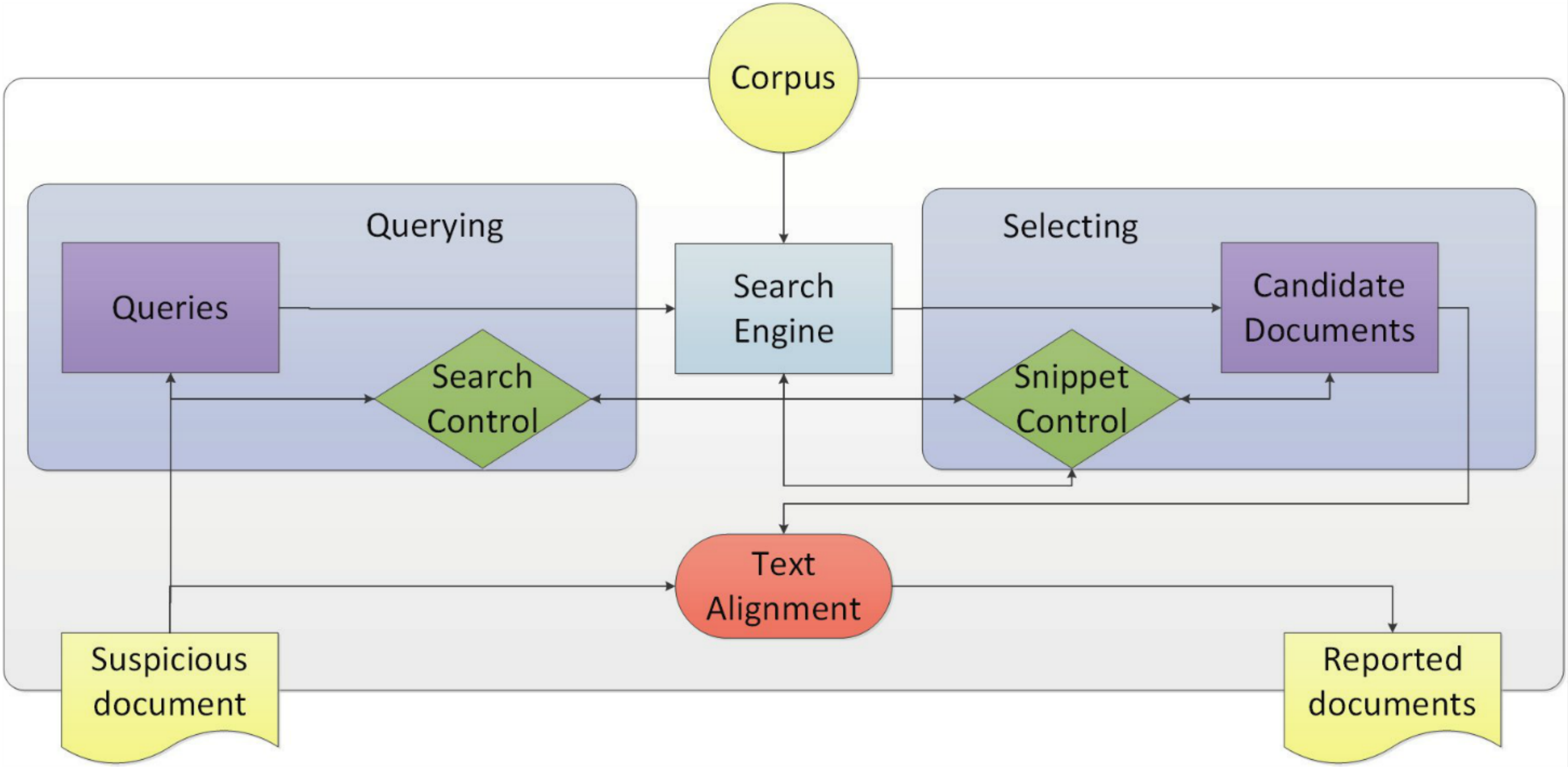

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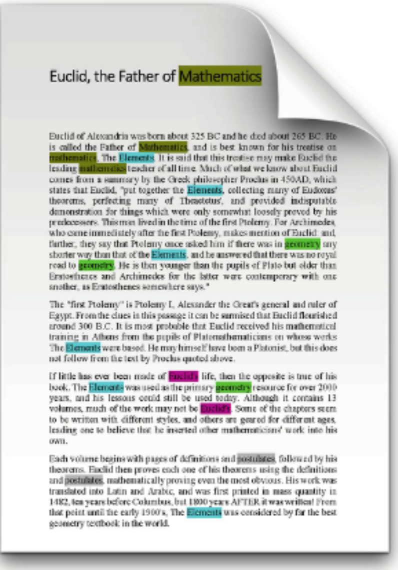

Euclid, the Father of Mathematics

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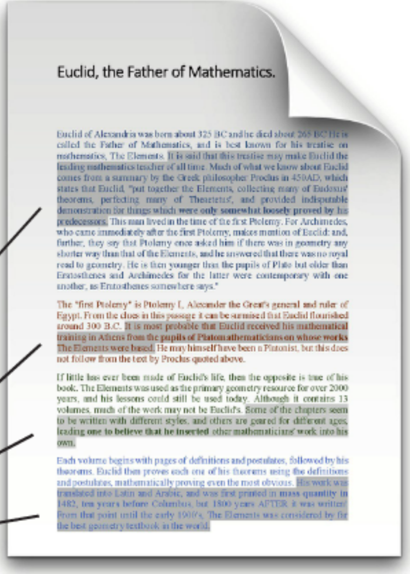

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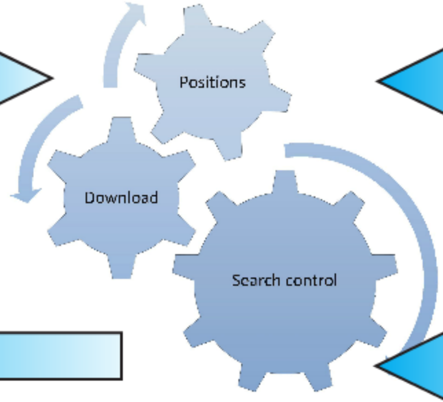

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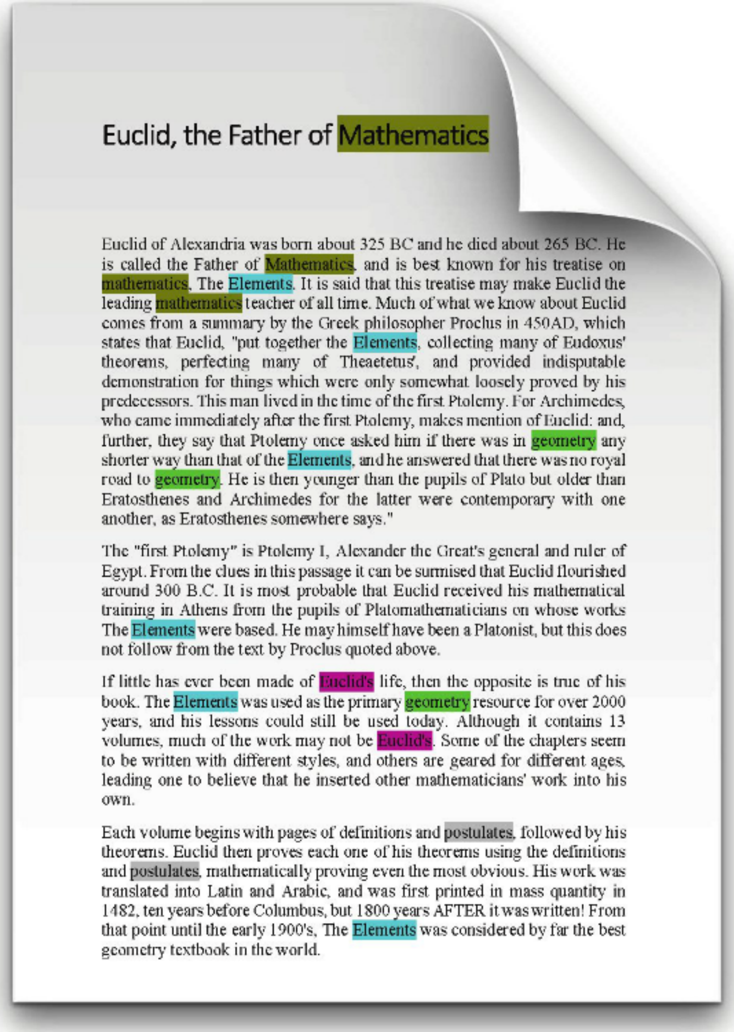

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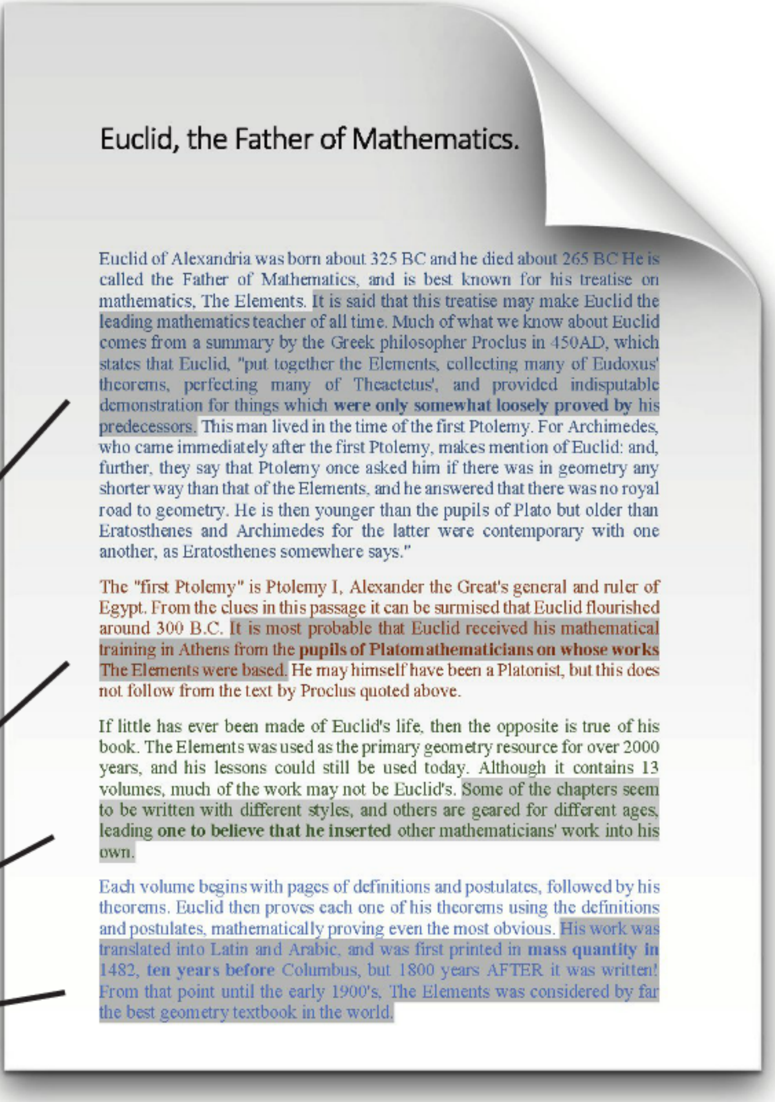

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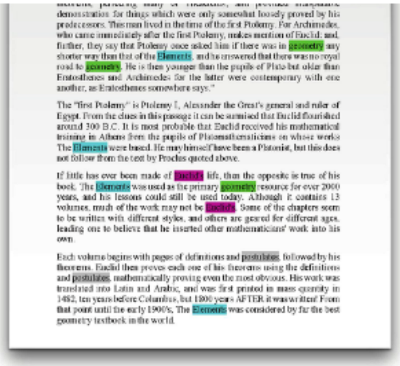

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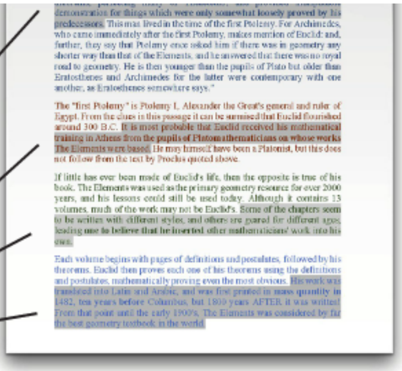

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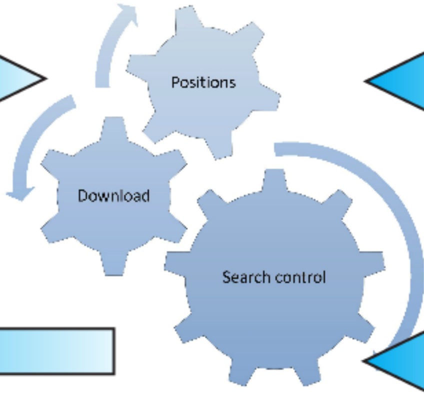

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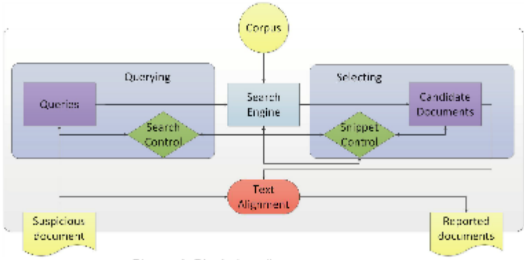

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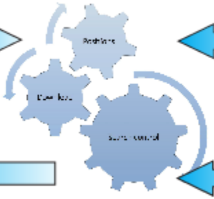

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