Exploiting Information Needs and Bibliographics for Polyrepresentative Document Clustering

Kamran Abbasi[1] Ingo Frommholz[1]

[1]Institute of Research in Applicable Computing
University of Bedfordshire UK

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Outline

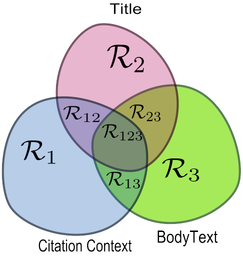
1. Introduction
2. Polyrepresentation and Clustering
3. Evaluation
4. Conclusion

Introduction

- Principle of Polyrepresentation in IIR
- Representations of information need and information object
- Helps to minimize the gap between user's space and information space
- Document Clustering

Polyrepresentation and Clustering

- Mapping of clusters to polyrepresentation
- Search strategy:
  1. User investigates total cognitive overlap cluster
  2. User jumps to different cluster based on preferences



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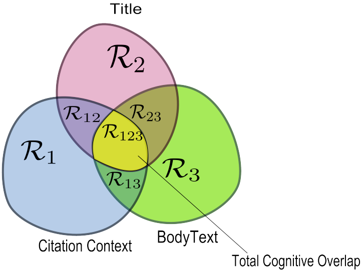

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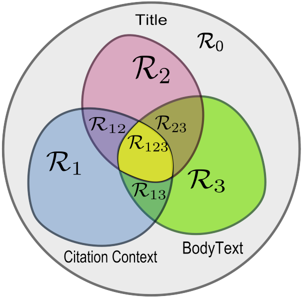

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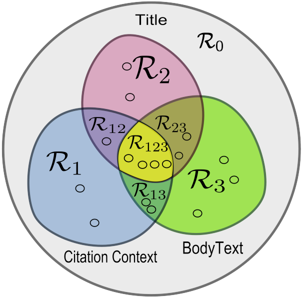

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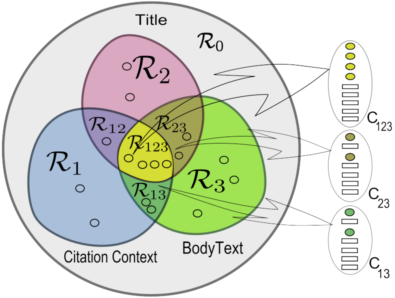


Simulated User and Cluster-based Ranking

- Rough simulation of search strategy
- Creates a ranking that we evaluate against baseline

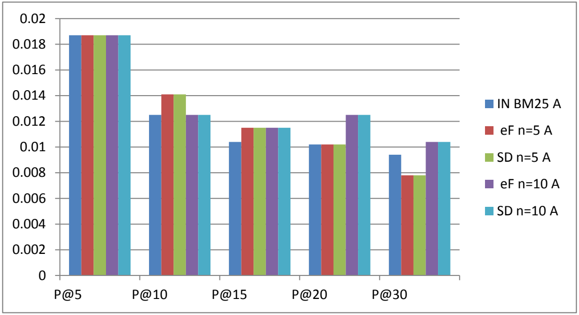
```
Require: Clustering $\mathcal{C}$, $k$
  $r \leftarrow ()$ {The ranking, initially an empty list}
  $C \leftarrow$ ranked list of clusters in $\mathcal{C}$ (using eF or SD)
  for all cluster $c \in C$ do
    $l \leftarrow$ ranked list of documents in $c$ {process $C$ in descending weight order}
    for $i = 1$ to $k$ do
      $r \leftarrow r + l[i]$ {append document at rank $i$ to $r$}
    end for
  end for
  return $r$
```

Experiment Setup

- PF (full text) sub collection of iSearch collection
- Collection's citation information is used for context extraction
- Terrier3.5 Search Engine

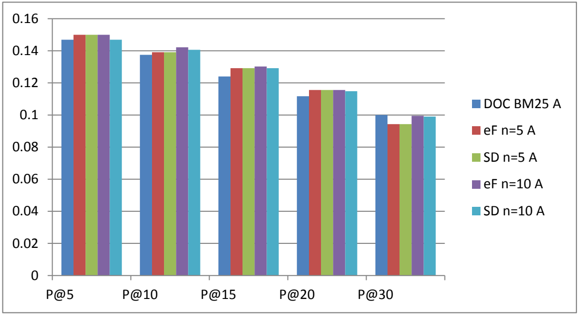
Evaluation Results

Results for All Queries IN



Evaluation Results

Results for All Queries Doc



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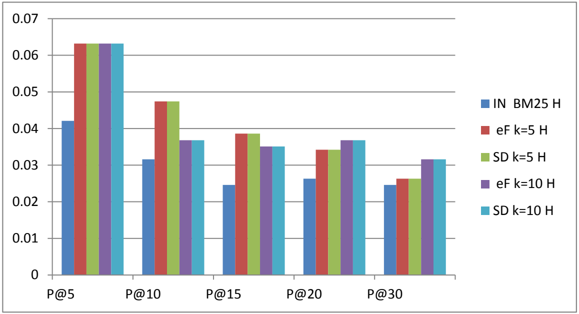
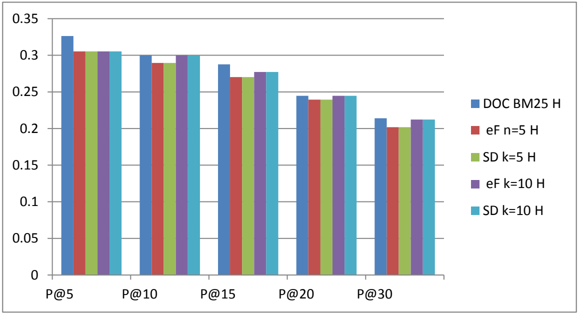
Queries with High Relevance Information IN



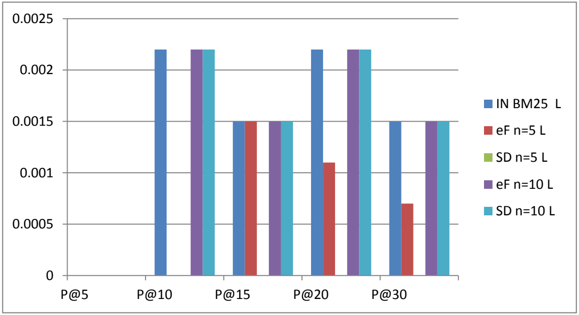
Evaluation Results

Queries with High Relevance Information Doc



Evaluation Results

Queries with Low Relevance Information IN



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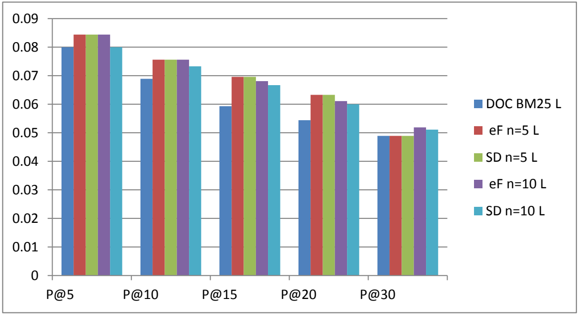
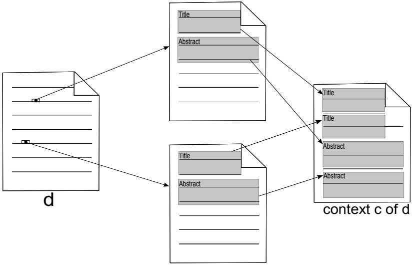


Conclusion

- Cluster ranking and cluster-based ranking have potential
- Bibliometric information i.e citation context and references show improvement on IR performance when combined with clustering
- Simulated user based evaluation of interactive systems can be enhanced

Bibliographic context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