Using Summary techniques to Answer Definition Questions

CS5244 Course Project

JIA Yanjun

Introduction

- Motivation: Improve information seeking accuracy in Digital Library
- IR (keyword->Documents) vs. QA (Question->Answer)
- Definition questions: For example, "*Who is Fred Durst?*" The response is a list of sentences.
- Goal : The answer should be exhaustive while maintaining the cohesion and eliminating redundancy.

- Summary: a set of sentences extracted verbatim from a text which cover major substance of that text
- Goal: include as much relevant information as possible for which the user is looking and excludes extraneous and redundant information.

Introduction (cont.)

- In the limit question answering and summarization may merge as research areas.

- Concern: Redundancy and Diversity

- Redundancy-> MMR

- Diversity->Clustering

System Architecture
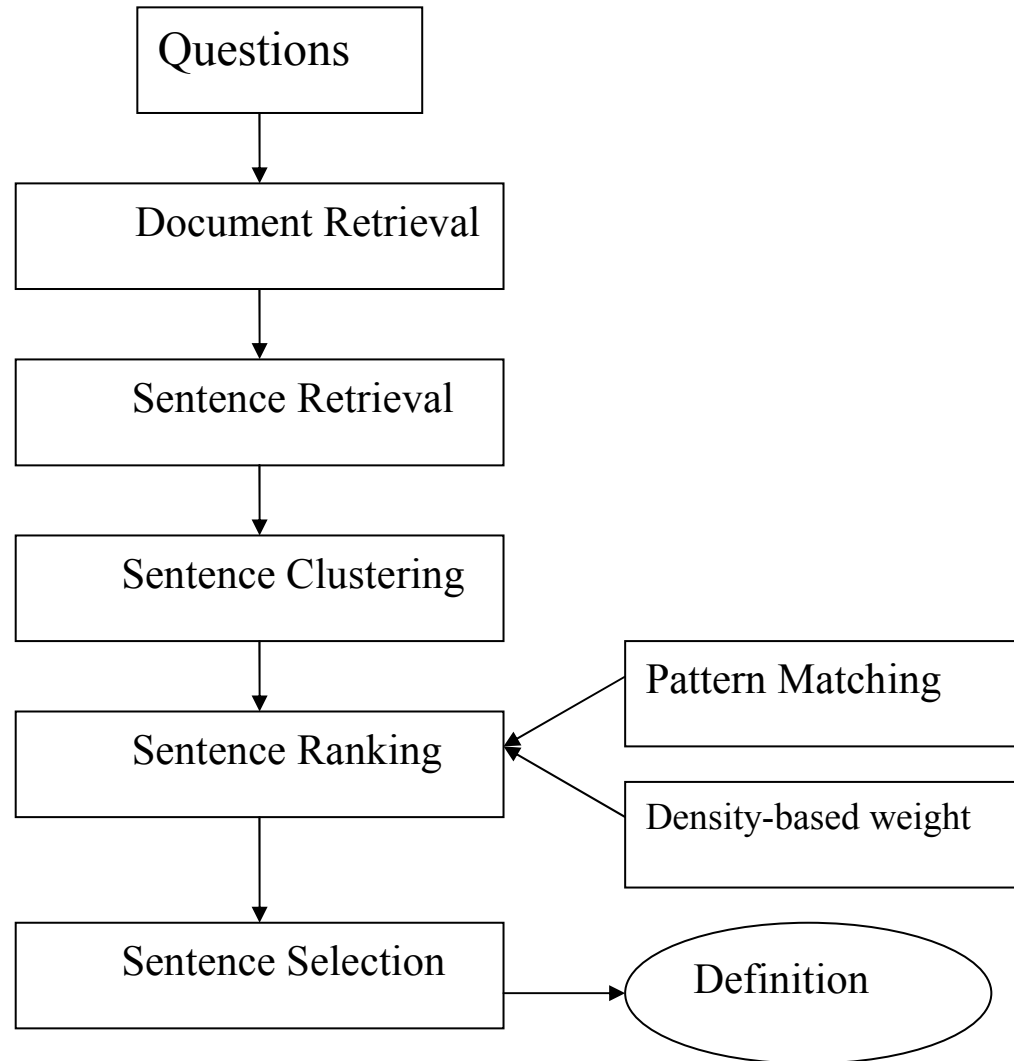
Approach

- K-means Clustering Algorithm
- Pattern Matching: Hybrid approach
- Density-based Ranking: SiteQ+
- MMR Summary Generation

Evaluation

- Recall= number of correct concepts retrieved/ number of concepts in the ground truth list.
- Precision =1- (Length-Allowance)/Length
- An allowance of 200 non-white-space characters is given for each correct concept retrieved.
-
$$F = \frac{(\beta^2 + 1)RP}{\beta^2 P + R}$$

- β is set to 5 to reflect the emphasis gave to recall and adjust for the crudeness of the length approximation to true precision.

Evaluation (cont.)

- SETUP
- a corpus consisting of 160 documents taken from TREC corpus
- 16 questions: selected from those in TREC QA Track 2004+Manually Construct
- RESULT

	Baseline	Cluster	MMR	Cluster+MMR
P	0.313	0.314	0.360	0.379
R	0.304	0.325	0.358	0.361
F5	0.305	0.327(+7.2%)	0.367(+20.3%)	0.388 (+27.2%)

Conclusion

- By measuring the answer extraction performance in isolation, the preliminary experiment shows that summary techniques are very useful in definitional question answering system.

- More extensive experiments and detailed error analysis is needed.

- Explore more summary techniques in definitional QA systems to produce a coherent natural language definition.