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Comparative study of Search Engine Result Visualization: Ranked Lists Versus Graphs

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1. Motivation

• Locating information in general interest domain with no specific knowledge is not well supported by modern WWW IR systems [1].

• Search refinement by selectively following hyperlinks part of user coping strategies [2] to alleviate this predicament.

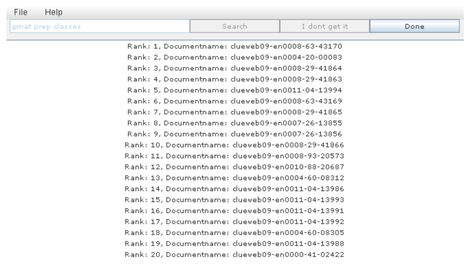
2. Objective: Show the inherent connectivity

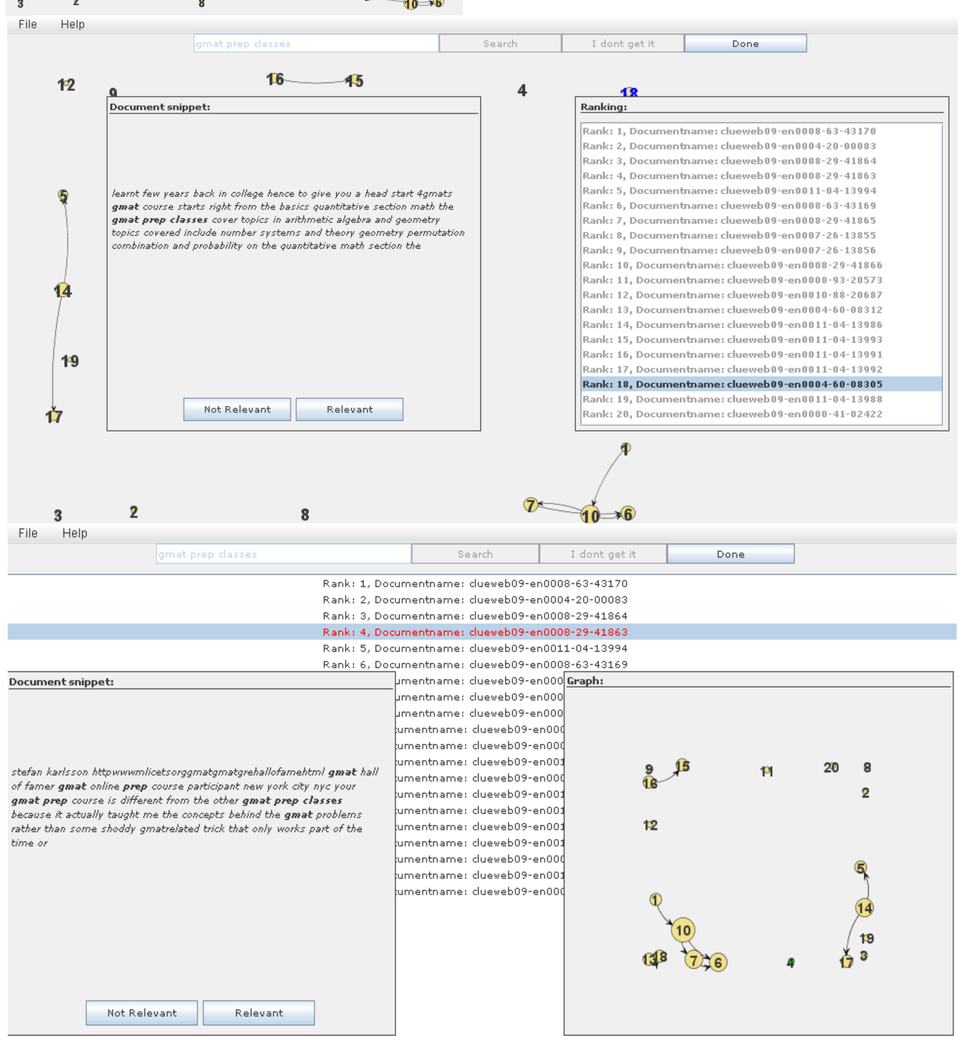
Current:
Search engine results (SER) (e.g. Google or Yahoo) does not show any connectivity between these results.

Our proposal:
Showing the user an SER graph could:
1. Improve retrieval effectiveness
2. Decrease time spent looking at documents.
3. SOMETHING INTELLIGENT ABOUT THE CLICK ORDER

3. Interfaces

• Data: Clueweb09 Subset B. No spam filtering.
• Queries: 200 TREC queries and relevance assessments. No user-submissions.
• Snippet: Showing highest-scoring snippet.
• Visualisation: Top-20 retrieved docs (Indri 5.2) and links between these.





4. User Study

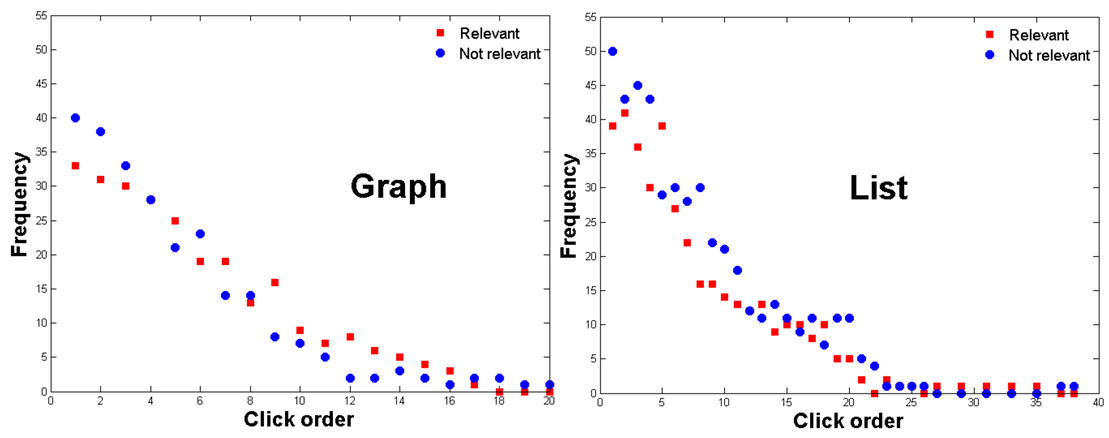
• "Assess how many of the documents shown in these interfaces are, in your opinion, relevant to the query"

• 10 users, 30 minute session.

5. Results

Retrieval effectiveness per interface					
List			Graph		
MAP @ 20	MRR	R @ 20	MAP @ 20	MRR	R @ 20
0.4195	0.4698	0.0067	0.3211	0.3948	0.0069

Time spent on interface (sec)							
List				Graph			
MIN	MAX	MEAN	STD	MIN	MAX	MEAN	STD
1.39	25.78	8.23	4.37	3.32	20.96	9.70	3.70



Mean rater agreement			
Inter-participant		Inter-rater	
List	Graph	List	Graph
0.198	0.044	-0.075	-0.072

5. Finding

Ranked lists results in faster and more precise search sessions than graph-based SER visualisations.

Future work

• Address limitations (population size, HTML extraction, connectivity sparsity, relevance to pre-typed queries)
• Scale up to large displays

References:
[1] G. Marchionini. Exploratory search: from finding to understanding. Communication of the ACM, 49(4):41 – 46, 2006.
[2] R.W. White, G. Murasen, G. Marchionini. Workshop on evaluating exploratory search systems. SIGIR Forum, 40(2):52 – 60, 2006.

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