

Query Interpretations from Entity-Linked Segmentations

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Webis

2,3

What is the intent?



source of the nile



What is the intent?

Is it ...

source | of the | Nile



What is the intent?

Is it ... or ... ?

source | of the | Nile



Source_of_the_Nile



What is the intent?

What does Google think?



source of the nile



All

Images

Maps

Videos

News

More

Tools

Nile / Sources



Blue Nile River



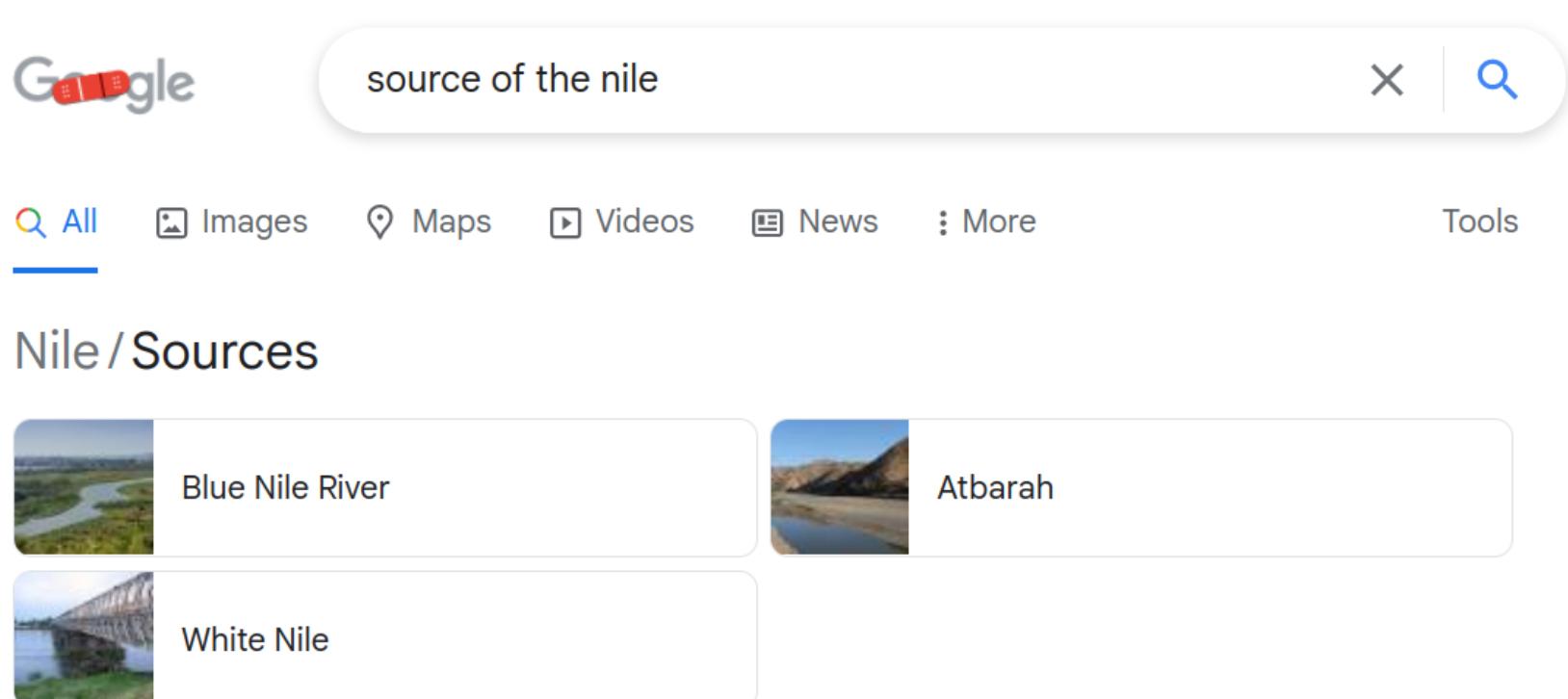
Atbarah



White Nile

What is the intent?

What does Google think?



A screenshot of a Google search results page. The search bar at the top contains the query "source of the nile". Below the search bar, there are several navigation links: "All" (which is underlined in blue), "Images", "Maps", "Videos", "News", and "More". To the right of these links is a "Tools" button. The main content area features three cards. The first card, titled "Nile / Sources", shows images and labels for the "Blue Nile River" and "Atbarah". The second card, titled "White Nile", shows an image of a bridge over a river.

source of the nile

All Images Maps Videos News More Tools

Nile / Sources

Blue Nile River

Atbarah

White Nile

⇒ Where is the board game?

Computational Problems

Entity Linking

source of the nile

Explicit entities:

Computational Problems

Entity Linking

source of the **nile**

Explicit entities:



Nile

Computational Problems

Entity Linking

source of the nile

Explicit entities:



Nile



Source_of_the_Nile

Computational Problems

Entity Linking

source of the nile

Explicit entities:



Nile



Source_of_the_Nile

...

Implicit entities:

Computational Problems

Entity Linking

source of the nile

Explicit entities:



Nile



Source_of_the_Nile

...

Implicit entities:



White_Nile

Computational Problems

Entity Linking

source of the nile

Explicit entities:



Nile



Source_of_the_Nile

...

Implicit entities:



White_Nile



Blue_Nile

Computational Problems

Entity Linking

source of the nile

Explicit entities:



Nile



Source_of_the_Nile

Implicit entities:



White_Nile



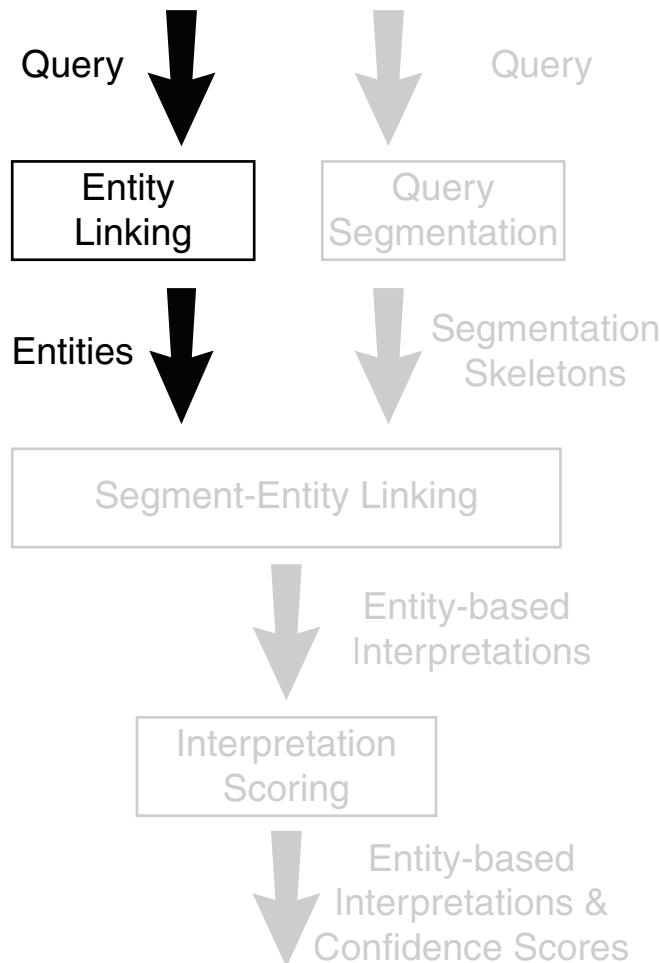
Blue_Nile

...

...

Computational Problems

Query Interpretation



source of the nile

nile → Nile

source of the nile → ...

...

source | of the | nile

source of the nile

...

source | of the | Nile

Source_of_the_Nile

...

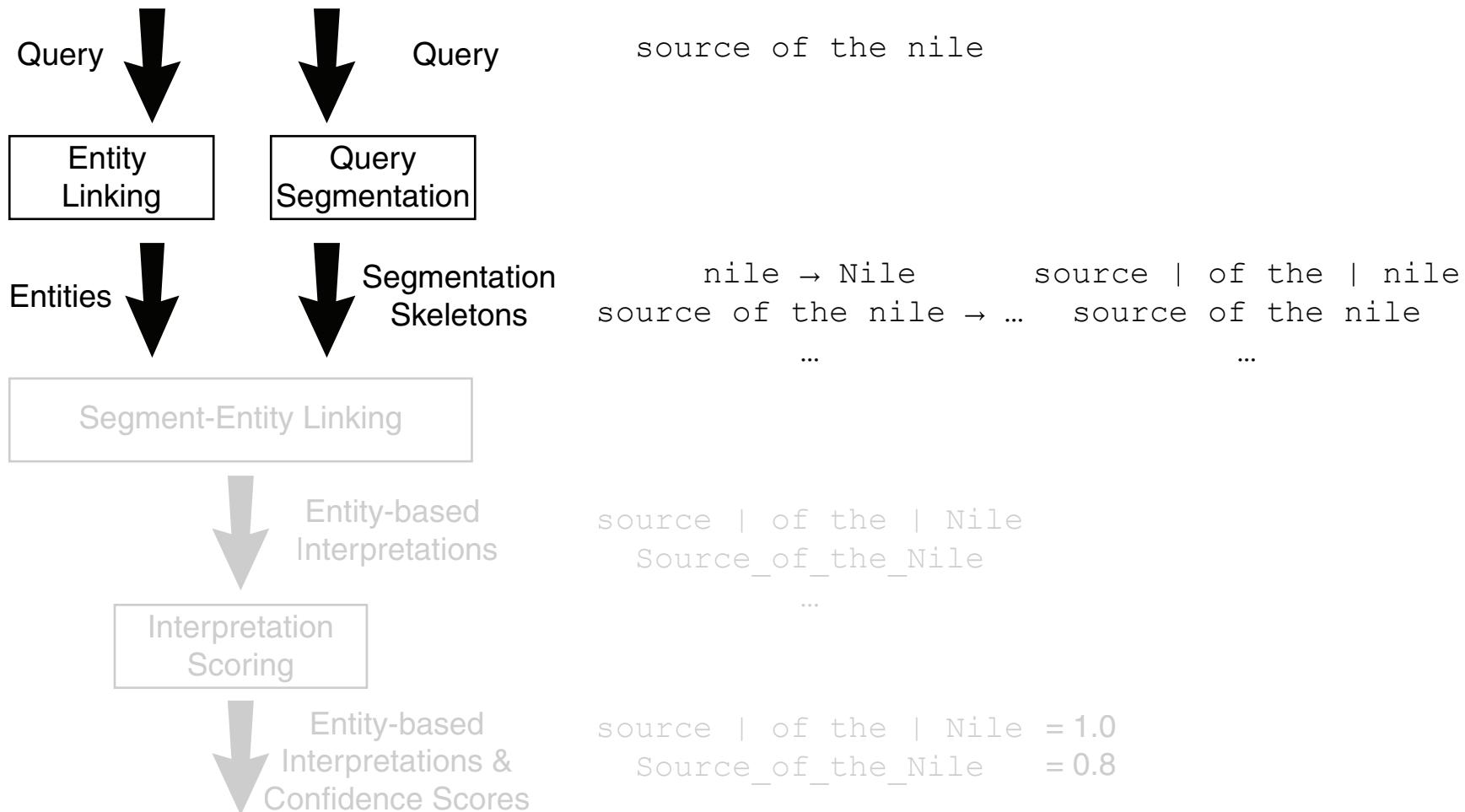
source | of the | Nile = 1.0

Source_of_the_Nile = 0.8

...

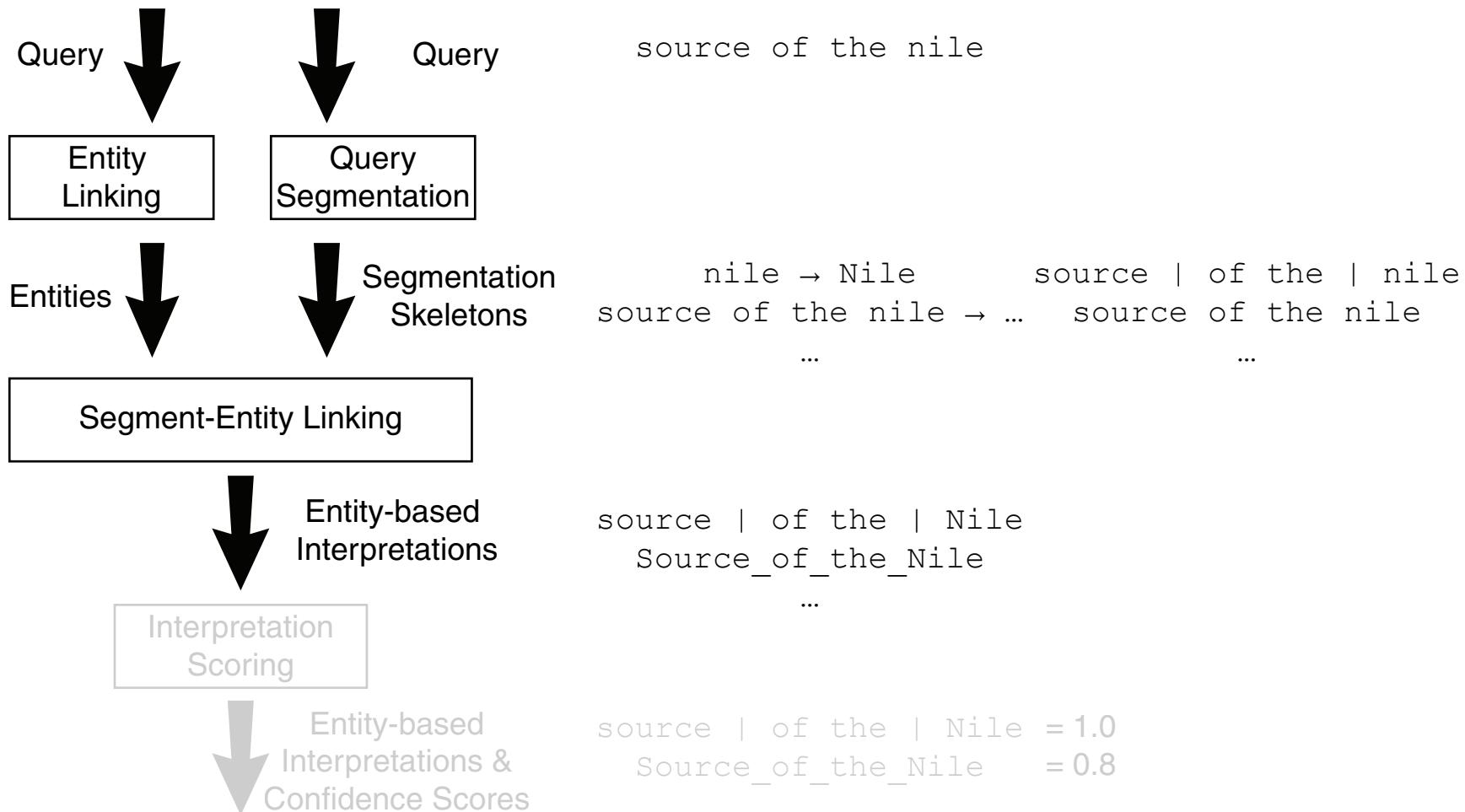
Computational Problems

Query Interpretation



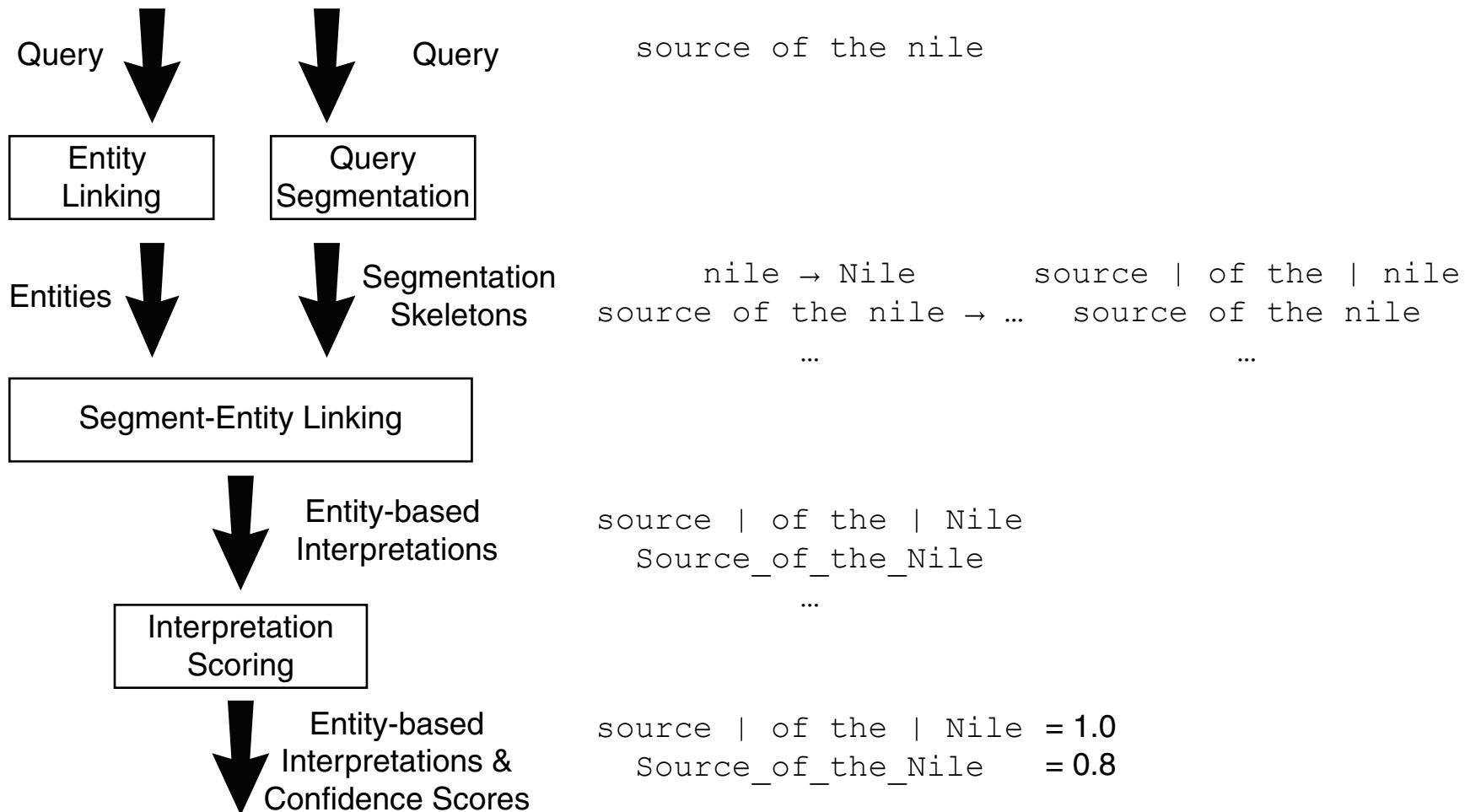
Computational Problems

Query Interpretation



Computational Problems

Query Interpretation



Evaluation

Experiment: Query Interpretation

Comparison to pairs of *greedy interpretation finding* [Hasibi et al., 2014] and various entity linking approaches.

Data:

- Test split of our new query interpretation dataset (544 queries)
- Interpretations that are at least “moderately likely”

Evaluation

Query Interpretation Results

	Complete Matches			Time (ms)
	Recall	Precision	F_1	
Our approach	0.295	0.336	0.283	47
Dexter	0.230	0.312	0.246	282
Nordlys EL	0.189	0.278	0.207	1,533
Radboud EL	0.144	0.199	0.155	200
Smaph	0.176	0.243	0.190	116,425
Dandelion	0.166	0.226	0.177	74
TagMe	0.165	0.216	0.175	99
Babelfy	0.112	0.160	0.124	49
TextRazor	0.098	0.131	0.105	367
FEL	0.133	0.173	0.141	22
Ambiverse	0.007	0.011	0.009	53

Conclusion

Contributions:

- Entity-based query interpretation
- Combination annotated dataset: 2,800 queries
- Recall-oriented explicit entity recognizer
- Segmentation-based query interpretation method
- Comparison to existing entity linking and interpretation methods

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Future work:

- Implicit entity recognition
- Query interpretation for conversational systems

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Thank you! :-)