

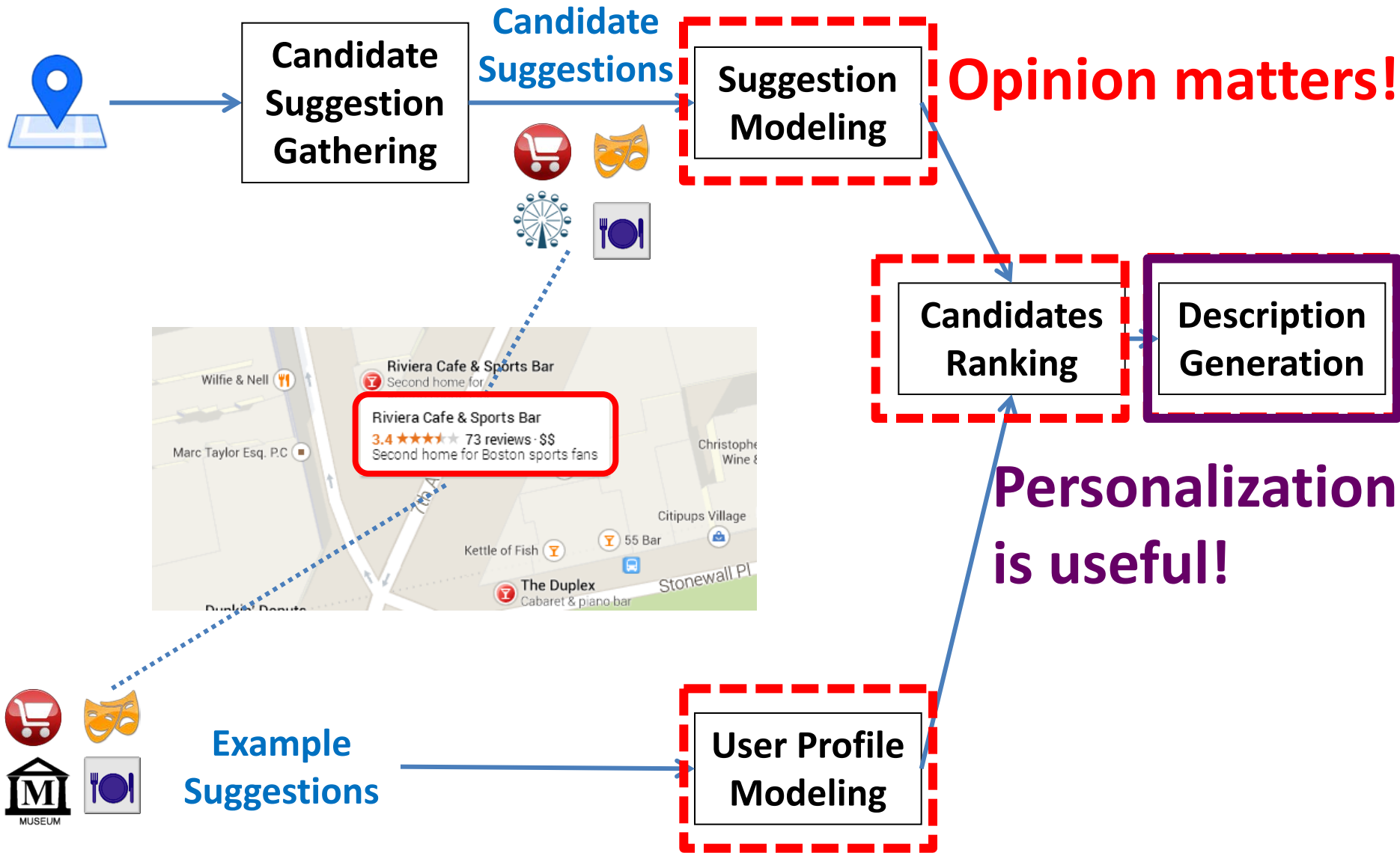
An Opinion-aware Approach to Contextual Suggestion

TREC 2013 Contextual Suggestion Track

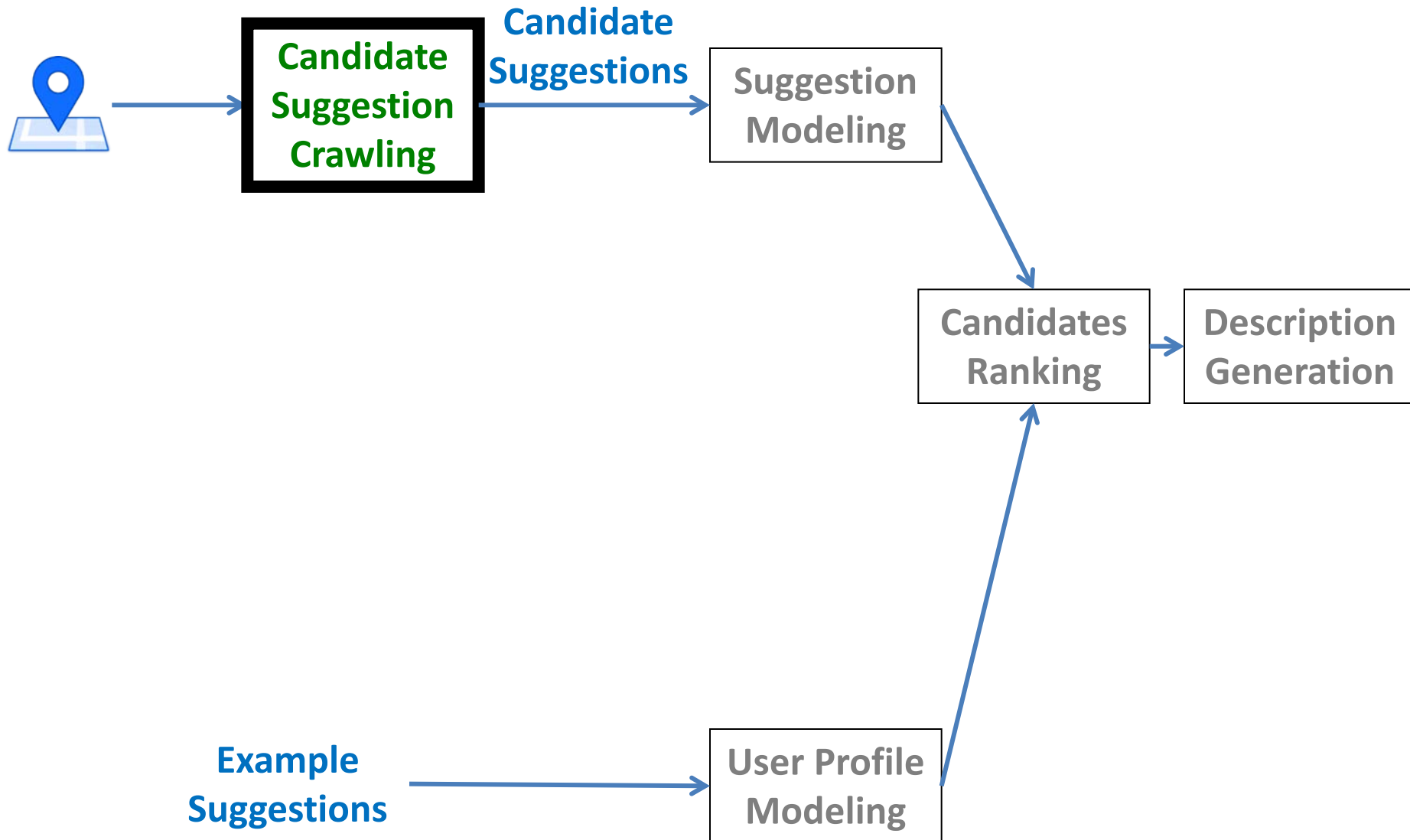


Peilin Yang and Hui Fang
University of Delaware

Overview of Our Methods



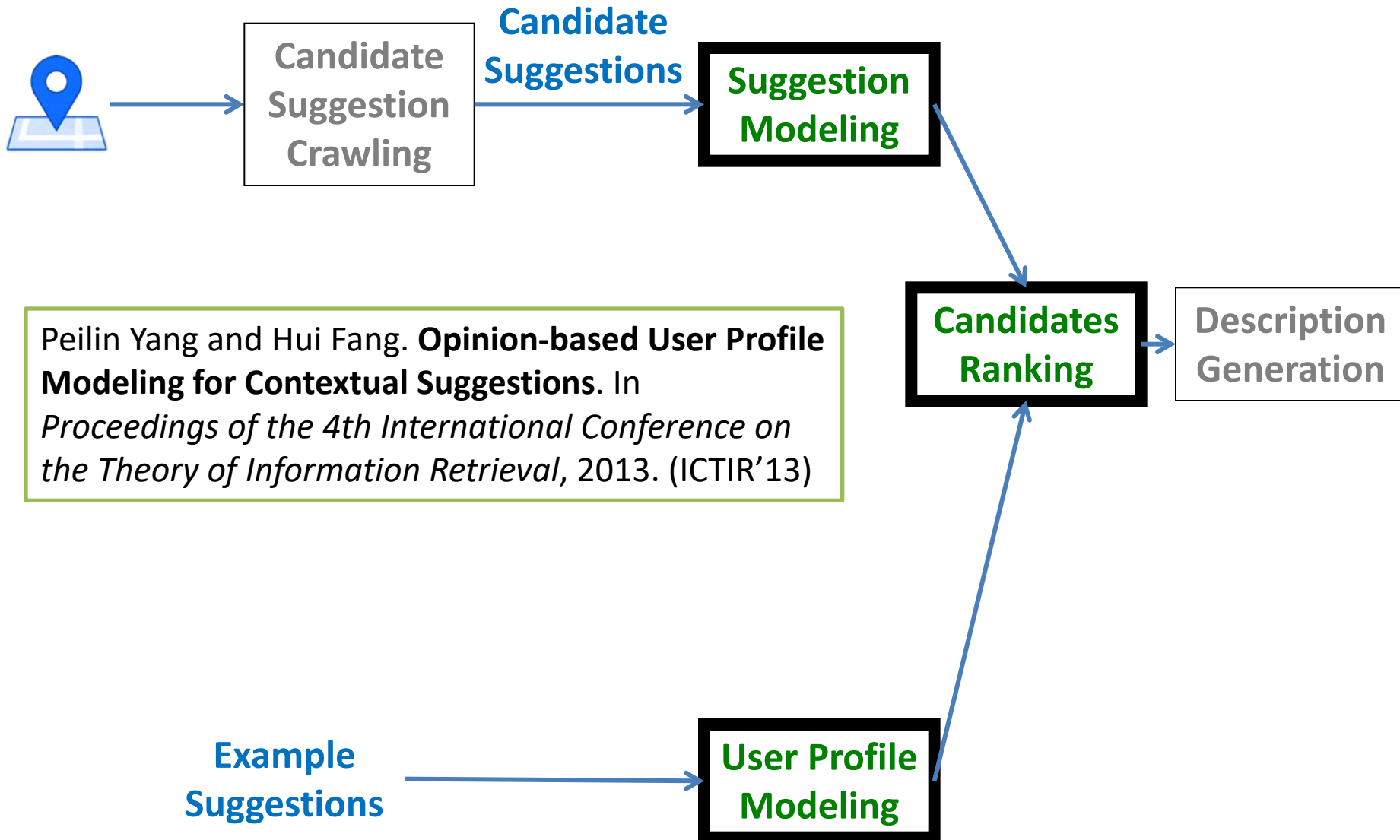
Overview of Our Methods



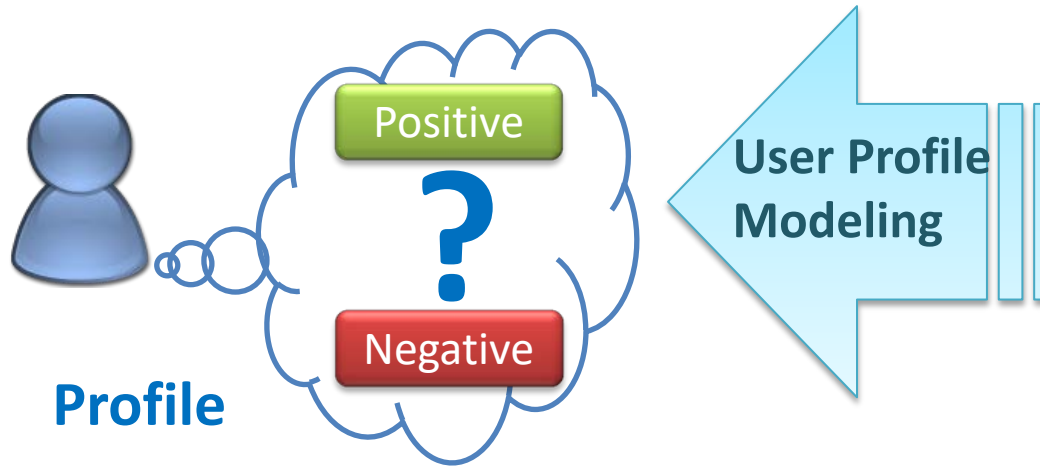
Crawling Suggestion Candidates

- Source : Yelp
- Strategy : At most 100 pages per top category (arts, shopping, food and etc.)
- Total number of crawled suggestions : 105,871
 - Average number of suggestions per context : 2,117
 - Max: 8410 (i.e., Washington D.C.)
 - Min: 302 (i.e., Crestview)



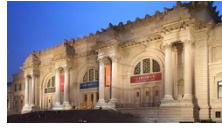





Overview of Our Methods



A Motivating Example



New York City

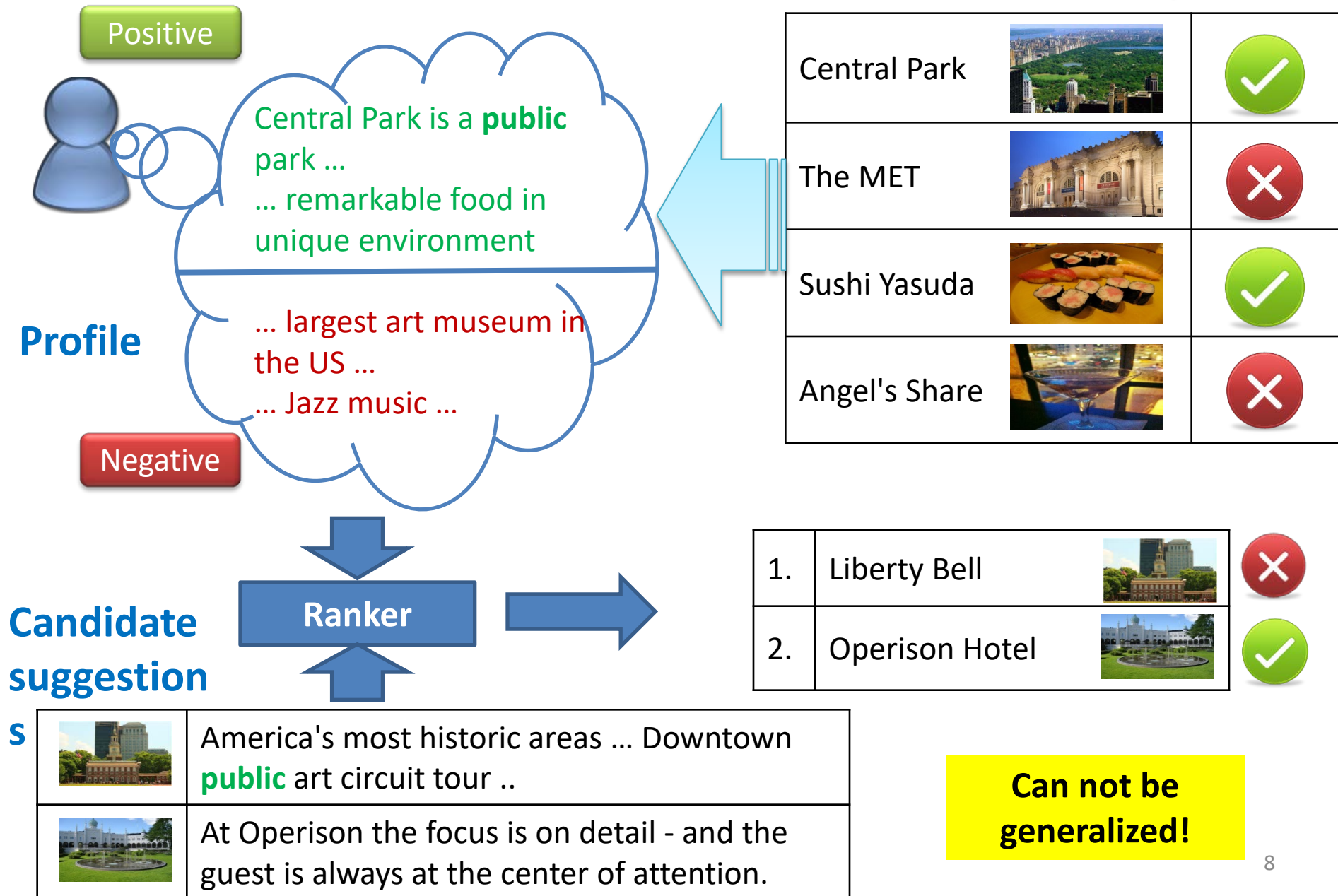
| | | |
|---------------|---|---|
| Central Park |  |  |
| The MET |  |  |
| Sushi Yasuda |  |  |
| Angel's Share |  |  |

Places from Philadelphia

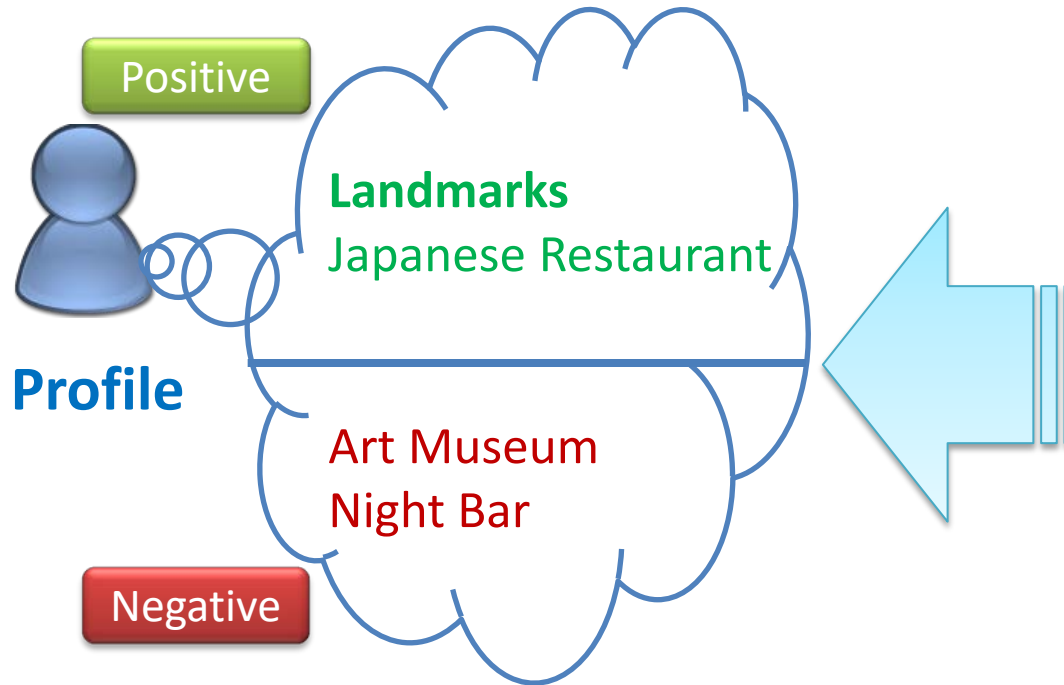
| | | |
|----------------|---|---|
| Operison Hotel |  |  |
| Liberty Bell |  |  |

Description-based Profile Modeling








New York City




Category-based Profile Modeling

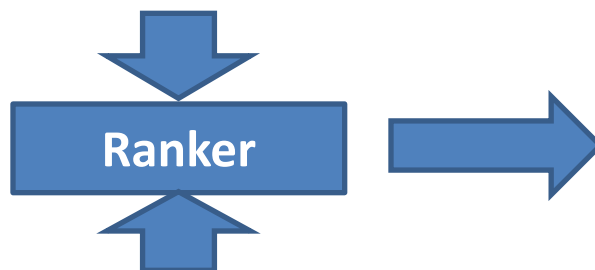






New York City

| | | |
|---------------|---|---|
| Central Park |  |  |
| The MET |  |  |
| Sushi Yasuda |  |  |
| Angel's Share |  |  |

**Candidate
suggestion
s**

| | |
|---|-----------|
|  | Landmarks |
|  | Hotel |



| | | | |
|----|----------------|---|---|
| 1. | Liberty Bell |  |  |
| 2. | Operison Hotel |  |  |

Still not quite right

From “What” to “Why”

New York City

| | |
|---------------|--|
| Central Park |  |
| The MET |  |
| Sushi Yasuda |  |
| Angel's Share |  |

From “What” to “Why”

New York City

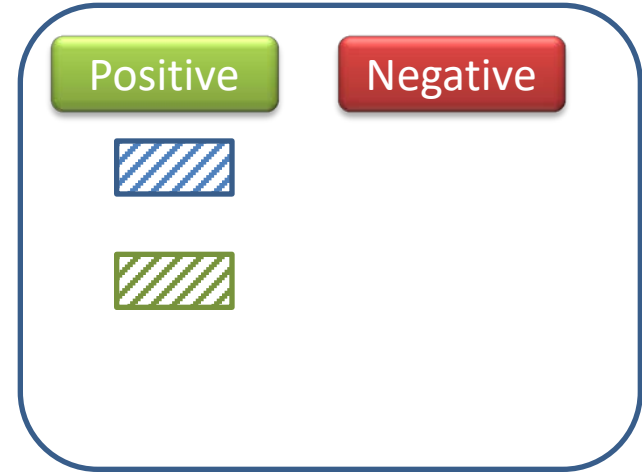
| | |
|---------------|--|
| Central Park |  |
| The MET |  |
| Sushi Yasuda |  |
| Angel's Share |  |



From “What” to “Why”

New York City

| | |
|---------------|--|
| Central Park |  |
| The MET |  |
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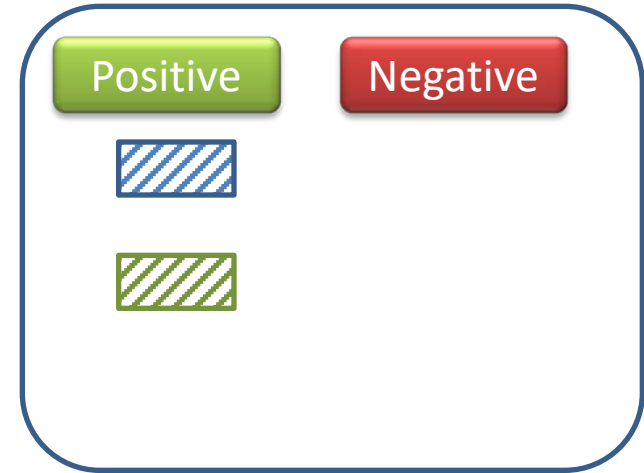


User Profile

From “What” to “Why”

New York City

| | |
|---------------|--|
| Central Park |  |
| The MET |  |
| Sushi Yasuda |  |
| Angel's Share |  |

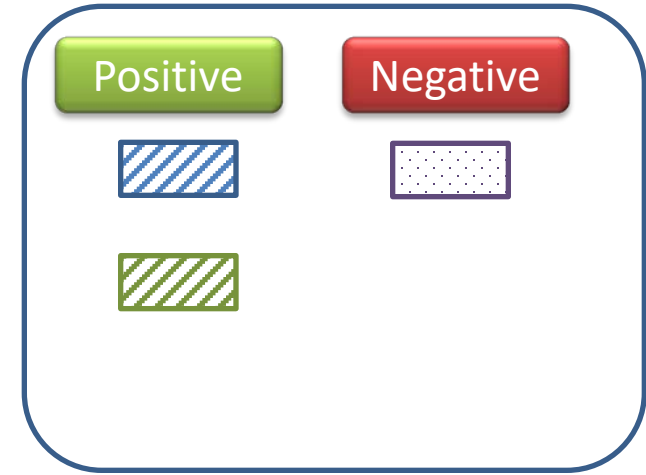


User Profile

From “What” to “Why”

New York City

| | |
|---------------|--|
| Central Park |  |
| The MET |  |
| Sushi Yasuda |  |
| Angel's Share |  |

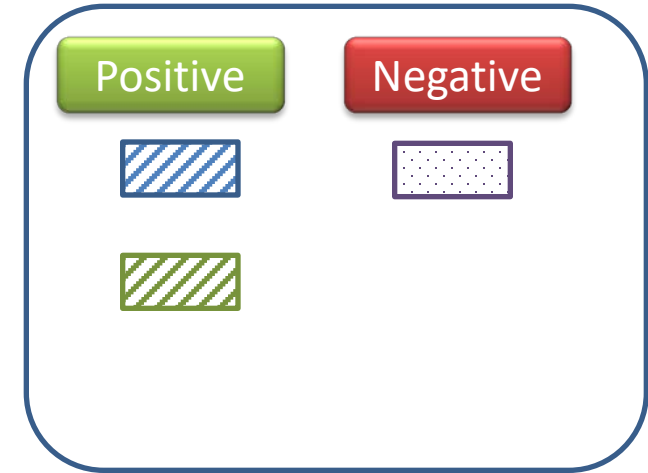


User Profile

From “What” to “Why”

New York City

| | |
|---------------|--|
| Central Park |  |
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| Sushi Yasuda |  |
| Angel's Share |  |

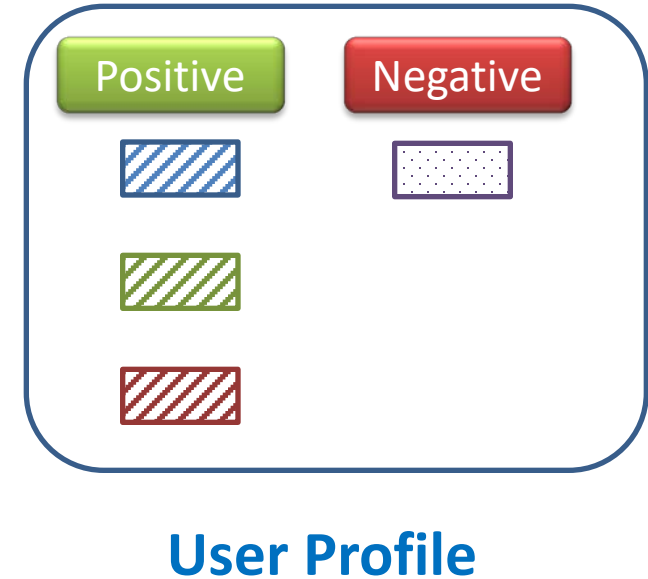


User Profile

From “What” to “Why”




New York City

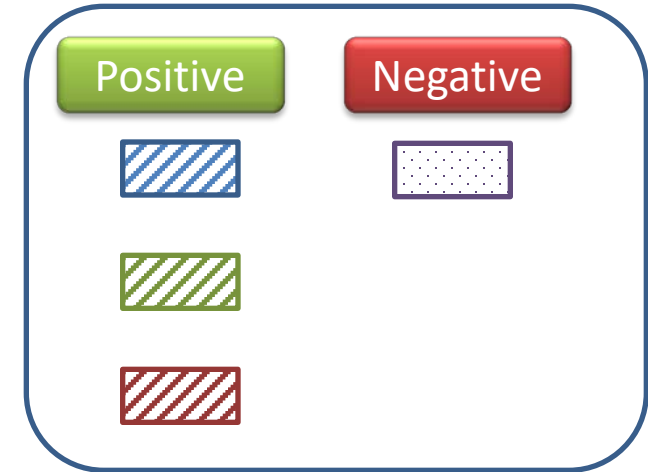
| | |
|---------------|--|
| Central Park |  |
| The MET |  |
| Sushi Yasuda |  |
| Angel's Share |  |



From “What” to “Why”

New York City


| | |
|---------------|--|
| Central Park |  |
| The MET |  |
| Sushi Yasuda |  |
| Angel's Share |  |

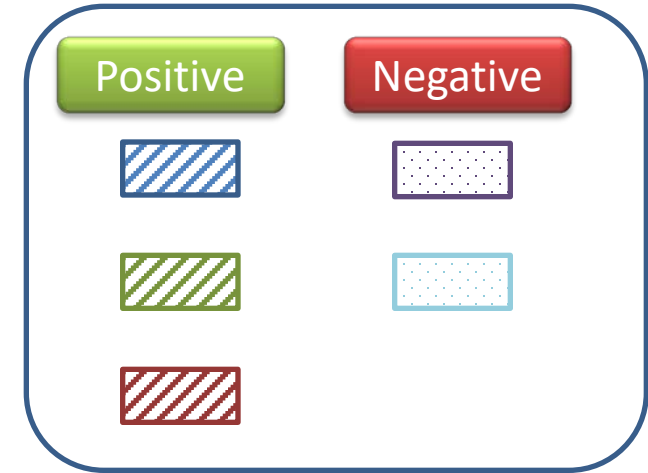


User Profile

From “What” to “Why”

New York City

| | |
|---------------|--|
| Central Park |  |
| The MET |  |
| Sushi Yasuda |  |
| Angel's Share |  |

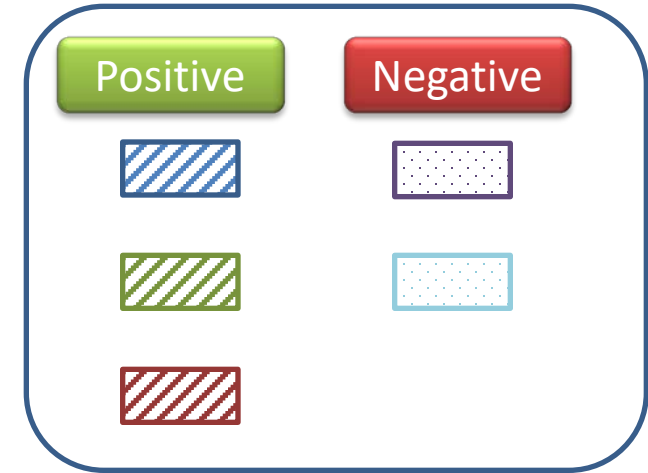


User Profile

From “What” to “Why”

New York City

| | |
|---------------|--|
| Central Park |  |
| The MET |  |
| Sushi Yasuda |  |
| Angel's Share |  |

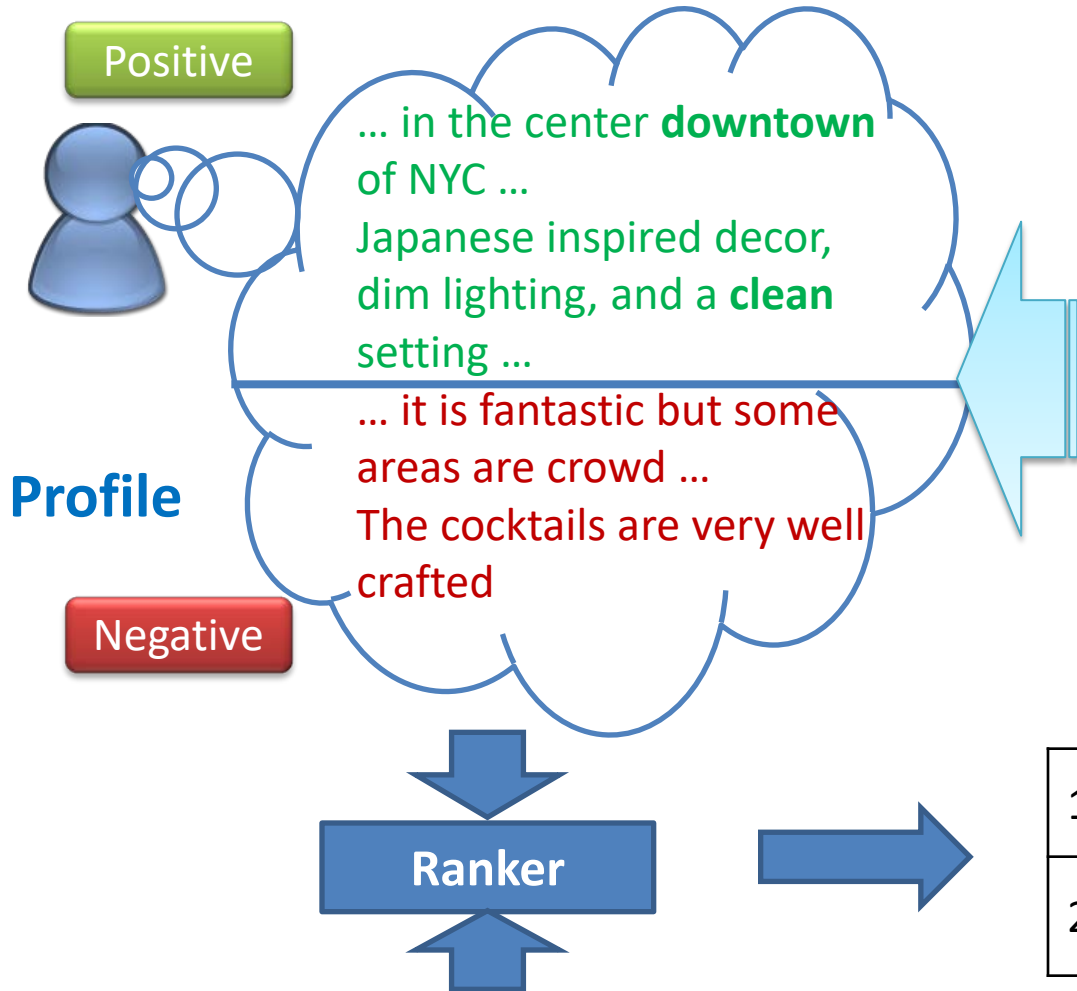


User Profile






Assumption:

A user's profile is constructed based on reviews of other users who share the similar opinions on the example suggestions.



Opinion-based Profile Modeling



New York City

| | | |
|---------------|---|---|
| Central Park |  |  |
| The MET |  |  |
| Sushi Yasuda |  |  |
| Angel's Share |  |  |

| | | | |
|----|----------------|---|--|
| 1. | Operison Hotel |  |  |
| 2. | Liberty Bell |  |  |

| | |
|--|--|
|  | ... A little bit far away from downtown it is crowd and you need to take bus to there ... |
|  | ... The hotel is very close to the train station ... The neat and clean environment is desirable... |

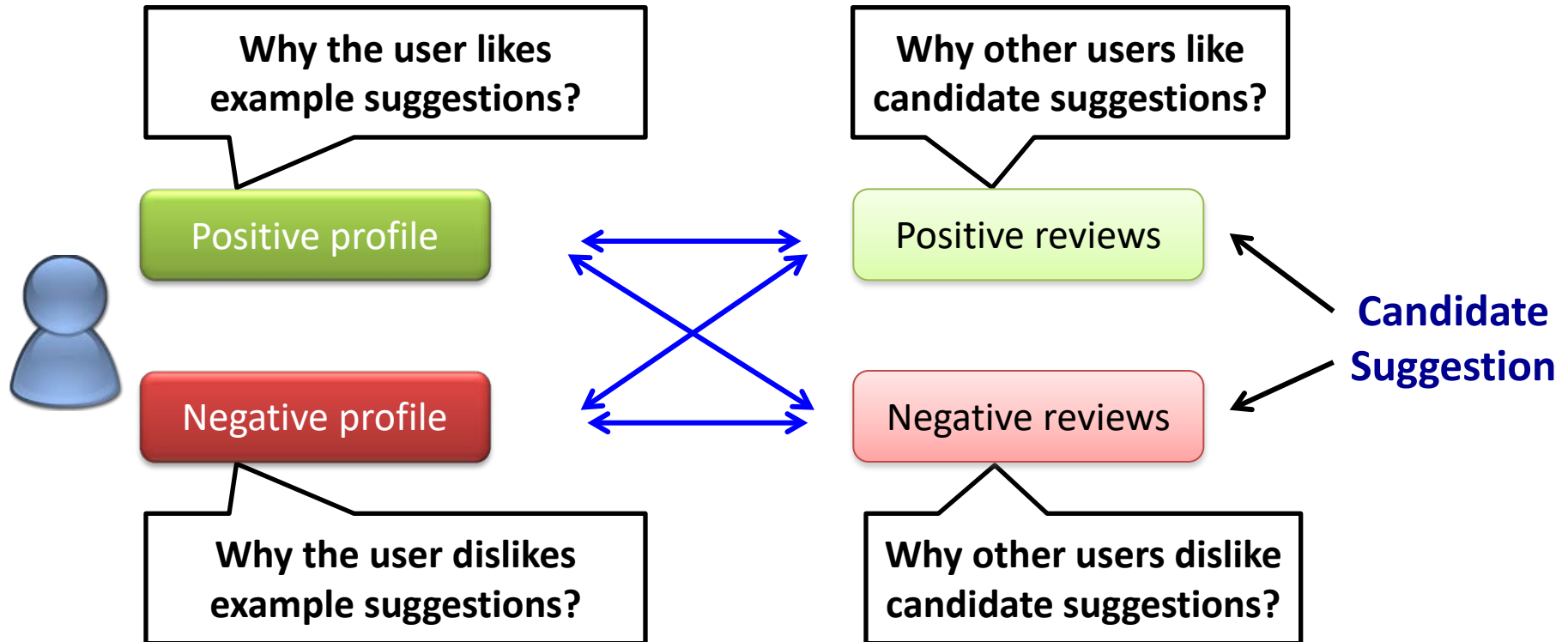
Representation of User Profiles

Original review

... From the stunning architecture to the croissant and latte served up in the food court downstairs. Go to this place and ask why all train stations can't be like this! Wow, over 100 tracks. Unbelievable architecture. Shopping, food. Etc. it is amazing. We ate at the oyster bar last time and that was a treat. The oyster pots are quite something.

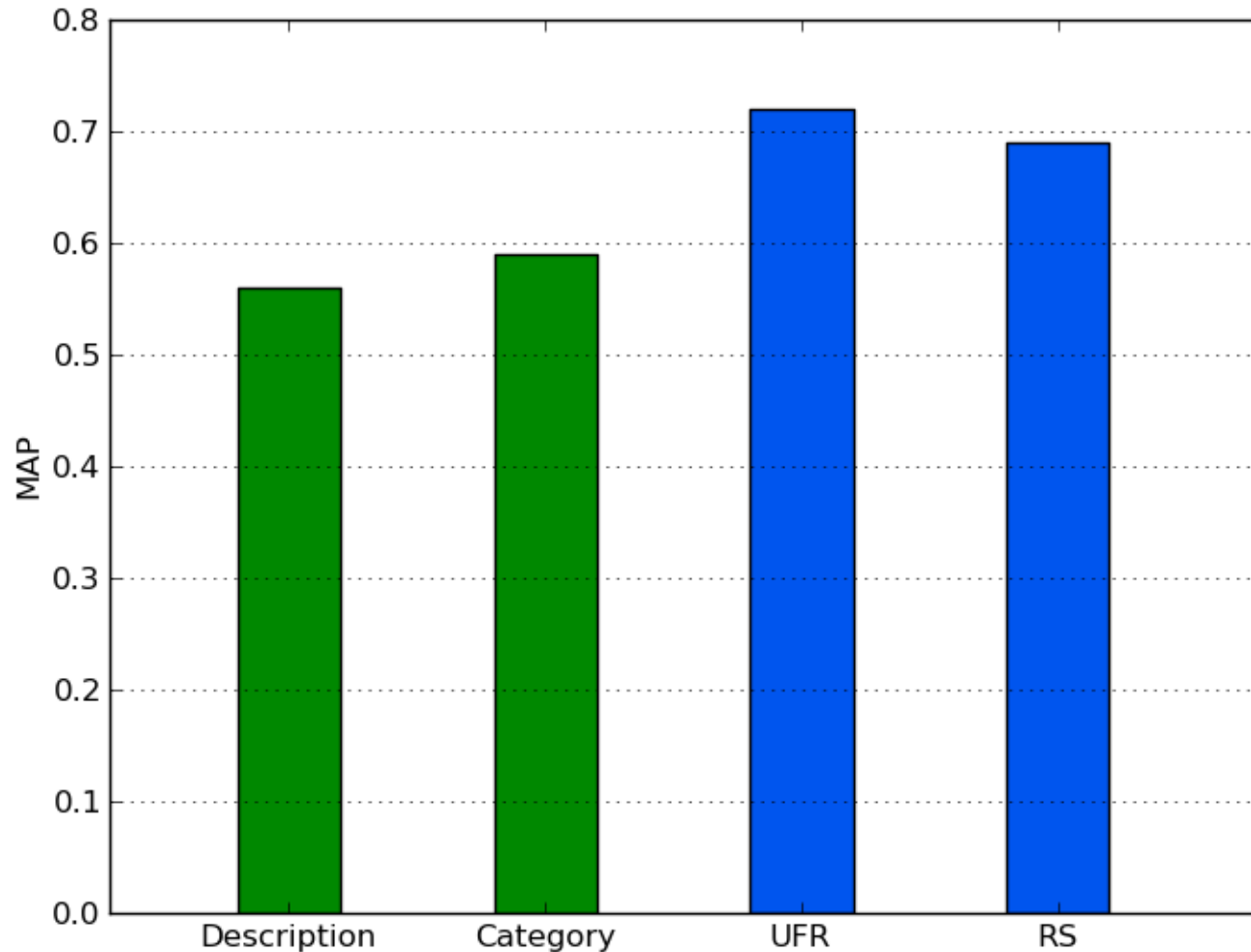
| | |
|----------------------------|--|
| Unique Full Reviews | Unique terms from the original review excluding stop words |
| Review Summaries | The review summaries generated by Opinosis [1]. |

Ranking candidate suggestions

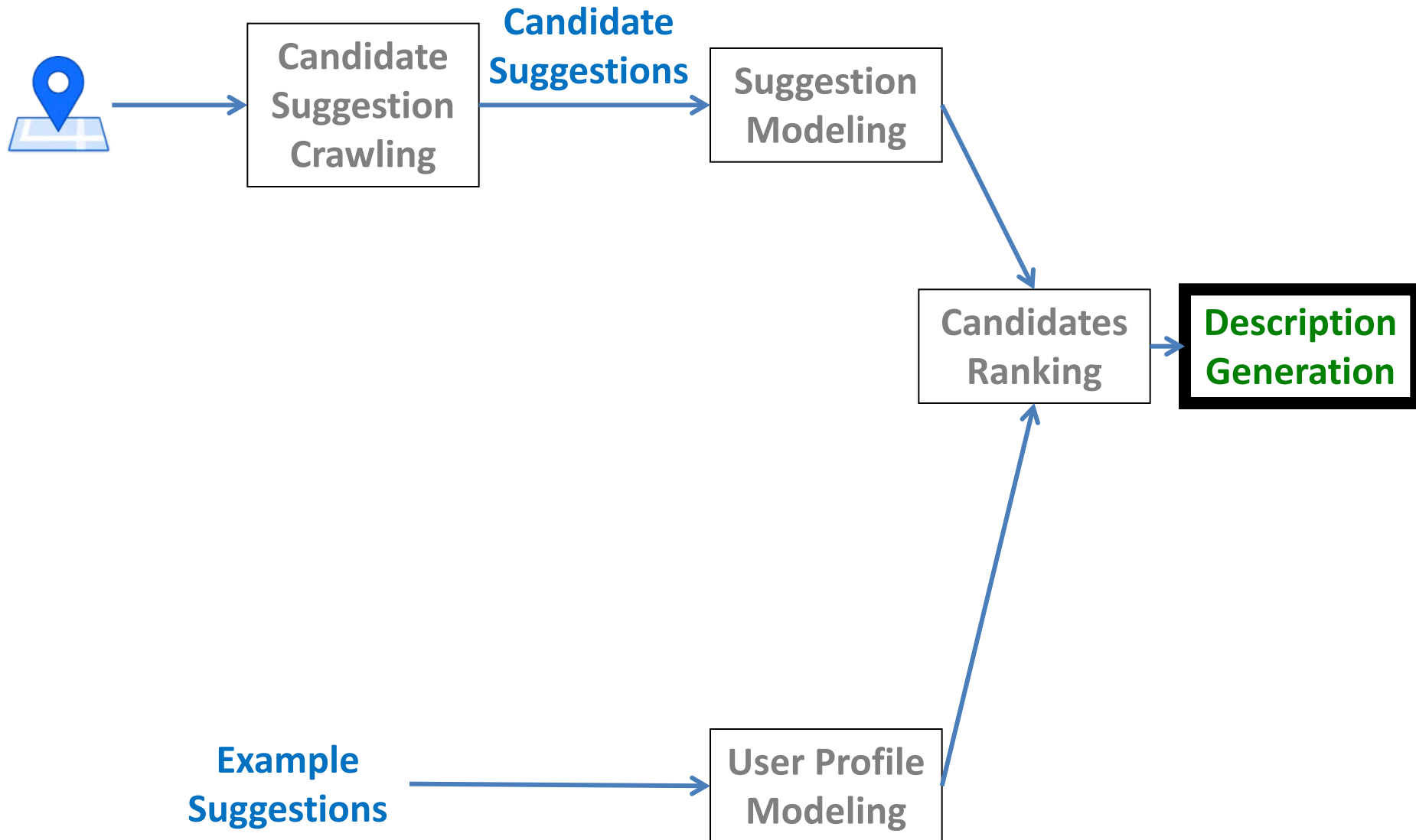


$$\begin{aligned}
 S(U, CS) = & \alpha \times SIM(U_{pos}, CS_{pos}) \\
 & - \beta \times SIM(U_{pos}, CS_{neg}) \\
 & - \gamma \times SIM(U_{neg}, CS_{pos}) \\
 & + \eta \times SIM(U_{neg}, CS_{neg})
 \end{aligned}$$

Preliminary Results on last year's data: Opinion-based methods are more effective.



Overview of Our Methods



Personalized Description Generation

- Opening Sentence
- “Official” Introduction
- Highlighted Reviews
- Concluding Sentence

What is this place?

Why do other people like it?

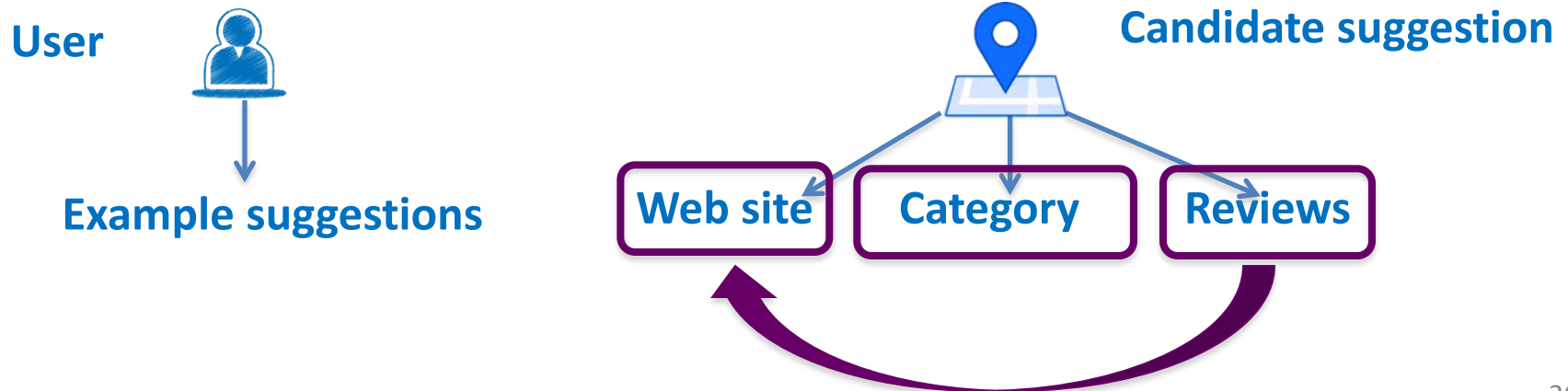
Why is it recommended for YOU?



Personalized Description Generation

- Opening Sentence
- “Official” Introduction
- Highlighted Reviews
- Concluding Sentence

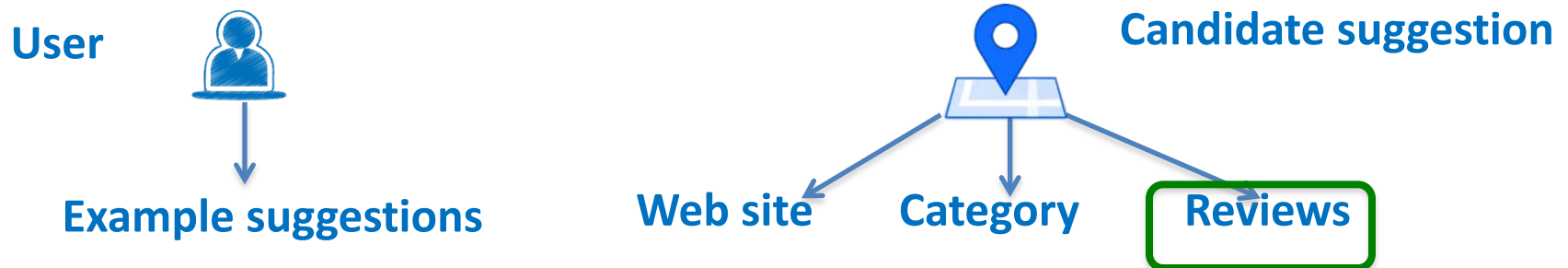
What is this place?



Personalized Description Generation

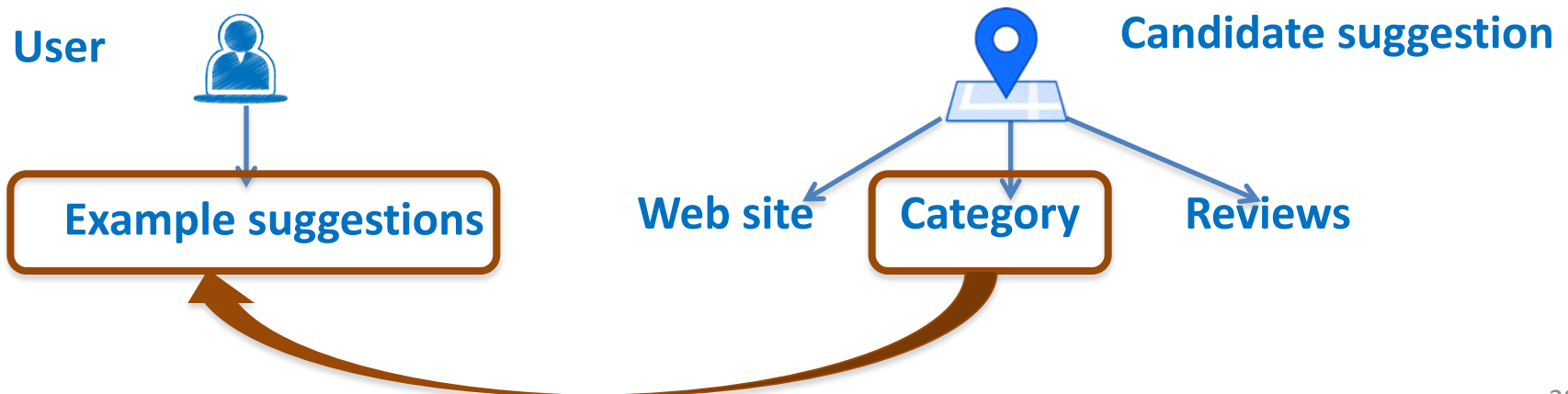
- Opening Sentence
- “Official” Introduction
- Highlighted Reviews
- Concluding Sentence

Why do other people like it?



Personalized Description Generation

- Opening Sentence
- “Official” Introduction
- Highlighted Reviews
- **Concluding Sentence** **Why is it recommended for YOU?**



An Example of Generated Description

What is this place?

"The Olive Room is a bar. HERE ARE THE DESCRIPTIONS FROM ITS WEBSITE: Here at the olive room, you will receive the finest cuisine montgomery has to offer.

HERE ARE REVIEWS FROM OTHER PEOPLE: If you are looking for a unique dining experience, with excellent food, service, location, and outstanding ambiance, look no further!

THIS PLACE IS SIMILAR TO OTHER PLACE(S) YOU LIKED, i.e. Tria Wine Room."

Why do other people like it?

Why is it recommended for YOU?

Description of Our Two Runs

| Runs | User Profile | Description |
|-----------|--------------------|--|
| UDInfoCS1 | Review Summaries | Opening Sentence + Meta Description + Web Site Sentences + Highlighted Reviews + Concluding Sentence |
| UDInfoCS2 | Unique Full Review | Opening Sentence + Meta Description + Highlighted Reviews + Concluding Sentence |

Effectiveness of the runs

(from the CS overview paper)

| Run | P@5 Rank | P@5 Score | TBG Rank | TBG Score | MRR Rank | MRR Score |
|---------------|----------|-----------|-------------|-----------|-------------|-----------|
| UDInfoCS1 | 1 | 0.5094 | 1 (-) | 2.4474 | 1 (-) | 0.6320 |
| UDInfoCS2 | 2 | 0.4969 | 2 (-) | 2.4310 | 2 (-) | 0.6300 |
| simpleScore | 3 | 0.4332 | 4 (Down 1) | 1.8374 | 4 (Down 1) | 0.5871 |
| complexScore | 4 | 0.4152 | 5 (Down 1) | 1.8226 | 6 (Down 2) | 0.5777 |
| DuTH_B | 5 | 0.4090 | 3 (Up 2) | 1.8508 | 3 (Up 2) | 0.5955 |
| 1 | 6 | 0.3857 | 8 (Down 2) | 1.5329 | 7 (Down 1) | 0.5588 |
| 2 | 7 | 0.3731 | 7 (-) | 1.5843 | 5 (Up 2) | 0.5785 |
| udel_run_D | 8 | 0.3659 | 9 (Down 1) | 1.5243 | 8 (-) | 0.5544 |
| isirun | 9 | 0.3650 | 6 (Up 3) | 1.6278 | 9 (-) | 0.5165 |
| udel_run_SD | 10 | 0.3354 | 16 (Down 6) | 1.2882 | 10 (-) | 0.5061 |
| york13cr2 | 11 | 0.3309 | 12 (Down 1) | 1.3483 | 15 (Down 4) | 0.4637 |
| DuTH_A | 12 | 0.3283 | 14 (Down 2) | 1.3109 | 12 (-) | 0.4836 |
| york13cr1 | 13 | 0.3274 | 15 (Down 2) | 1.2970 | 14 (Down 1) | 0.4743 |
| UAmsTF30WU | 14 | 0.3121 | 17 (Down 3) | 1.1905 | 13 (Up 1) | 0.4803 |
| IRIT.OpenWeb | 15 | 0.3112 | 10 (Up 5) | 1.4638 | 11 (Up 4) | 0.4915 |
| CIRG_IRDISCOA | 16 | 0.3013 | 18 (Down 2) | 1.1681 | 16 (-) | 0.4567 |
| CIRG_IRDISCOB | 17 | 0.2906 | 20 (Down 3) | 1.1183 | 19 (Down 2) | 0.4212 |
| uncsils_param | 18 | 0.2780 | 13 (Up 5) | 1.3115 | 18 (-) | 0.4271 |
| uogTrCFP | 19 | 0.2753 | 11 (Up 8) | 1.3568 | 17 (Up 2) | 0.4327 |
| ming_1 | 20 | 0.2601 | 22 (Down 2) | 1.0495 | 22 (Down 2) | 0.3816 |
| uncsils_base | 21 | 0.2565 | 19 (Up 2) | 1.1374 | 20 (Up 1) | 0.4136 |
| ming_2 | 22 | 0.2493 | 23 (Down 1) | 0.9673 | 23 (Down 1) | 0.3473 |
| uogTrCFX | 23 | 0.2332 | 21 (Up 2) | 1.0894 | 21 (Up 2) | 0.4022 |
| run01 | 24 | 0.1650 | 24 (-) | 0.7359 | 24 (-) | 0.2994 |
| baselineA | 25 | 0.1372 | 25 (-) | 0.5234 | 25 (-) | 0.2316 |
| csui02 | 26 | 0.0565 | 26 (-) | 0.1785 | 26 (-) | 0.1200 |
| csui01 | 27 | 0.0565 | 27 (-) | 0.1765 | 27 (-) | 0.1016 |

Effectiveness of description generation

| | UDInfoCS1 | UDInfoCS2 |
|-----------|-----------|-----------|
| Accuracy | 0.803 | 0.811 |
| Precision | 0.904 | 0.902 |
| Recall | 0.808 | 0.821 |

One observation regarding relevance assessment:

Among the 569 suggestions returned by both runs, 27.59% (157) of them have **inconsistent relevance labels for their websites, and 12.13% (69) of them have **inconsistent** relevance status.**

Thank you!

Questions?