

UWNLP at the NTCIR-12 Short Text Conversation Task

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This is a joint work with RSVP Technologies Inc., a cutting-edge AI and NLP R&D start-up (www.rsvptech.ca).

BACKGROUND

"Away from the city, so you can find your inner peace."

Facebook

Tyson Deaton
You can never find inner peace in the midst of chaos.

James Alots
Let's pray together.

Retha Mote
Right on point! 😊

Mao Metellus
Dude, you're toooo pessimistic.

Weibo

Anqi Cui
Get away from the city, and you will find your inner peace there. **BEST ANSWER!**

Kun Xiong
Sounds about right.

Ming Li
Inner peace comes from within you

Borui Ye
It's all about FOOD!!! 🍔 🍕 🍔

Zhihu

Flying Pig
If you believe so, think again. Inner peace is not dependent on circumstances or ...

Kevin84
In these situations, it seems as if inner peace is dependent on the accomplishment of some task ...

Metal Guru
Yes, we do have a temporary and short interval of inner peace, after an accomplishment, gain, relief ...

METHOD



1. Retrieve relevant posts

- Combine comments to their corresponding posts as documents.
- Index all the post texts, with Apache Solr.
- Retrieve documents based on the keywords of the query.
- Relevant but may not appropriate as a conversation response.



2. Score the posts & comments

Models

- Linear combination.
- Random forest*.

Features

- Character-based: Length of the longest common substring, overlapping of any character.
- Word-based: Cosine similarity, overlap similarity, word order similarity, inverse document frequency scores*, latent semantic analysis similarity, Word2Vec similarity**.

* Trained with 3,809 sentence pairs from search query logs, labeled manually.

** Trained with 200 million question-answer pairs from Baidu Zhidao and Sogou Wenwen.



3. Rank the document candidates

- (1) Length: Output longer comments in all retrieved candidates.
- (2) Max comment sim.: Output all comments $\{c\}$ of the best post p .

where $score(p) = sim(q, p) + \max\{sim(q, c)\}$

- (3) Combined sim.: Output the best comments.

where $score(c) = sim(q, p) + sim(q, c)$

RESULTS

Ranking Models and Comment Selection Methods of the Submitted Runs

Run ID	Ranking model	Comment selection
uwnlp-C-R1	Linear combination	Combined sim.
uwnlp-C-R2		Max comment sim.
uwnlp-C-R3		Length
uwnlp-C-R4	Random forest	Combined sim.
uwnlp-C-R5		Max comment sim.

Evaluated Results of the Submitted Runs

Run ID	Mean nDCG@1	Mean P+	Mean nERR@10
uwnlp-C-R1	0.2767	0.4284	0.4095
uwnlp-C-R2	0.2767	0.3977	0.3740
uwnlp-C-R3	0.1733	0.2564	0.2255
uwnlp-C-R4	0.1033	0.2085	0.1867
uwnlp-C-R5	0.1067	0.1862	0.1732

Number of Test Topics Containing Good Comments

Run ID	#L2@1	#L1+@1	#L2@10	#L1+@10
uwnlp-C-R1	17	25	64	93
uwnlp-C-R2	17	25	49	80
uwnlp-C-R3	8	12	32	59
uwnlp-C-R4	8	7	35	61
uwnlp-C-R5	8	8	30	53
Voting	19	42	47	79

Voting: Select 10 comment candidates from each of the 5 runs, add up their rankings, and use the sum as the final ranking measure.

CONCLUSIONS

- The linear combination model works better than the random forest model, mainly because of the different distribution between the training data and test data.
- The combined similarity method works better, showing that comments also provide useful semantic information with the query.
- Longer comments carry irrelevant information topically.
- The merge-and-vote strategy finds out the top candidate better, but not for the top-ten candidates.