DCU at the NTCIR-14 OpenLiveQ-2 Task

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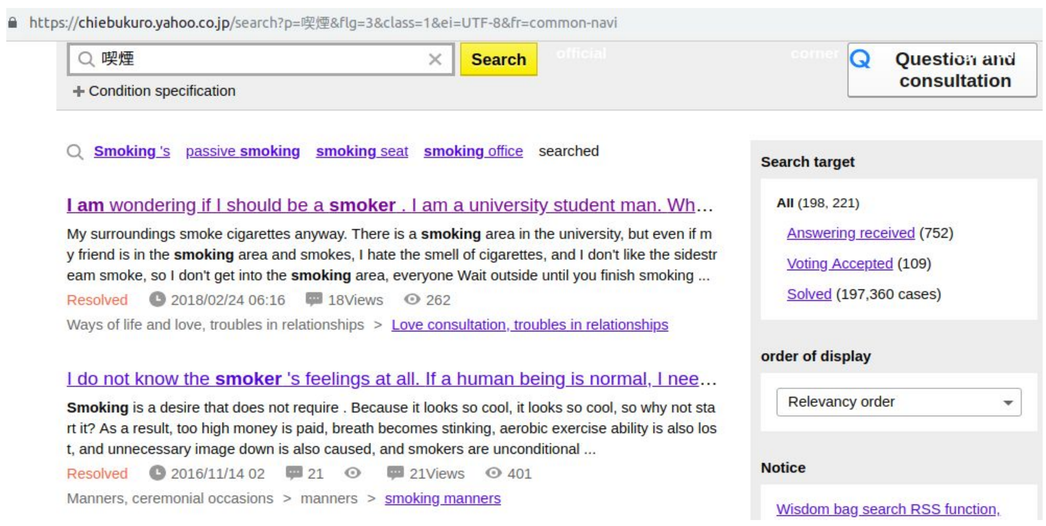
Engaging Content
Engaging People

Task Overview

- **Challenge:** Rank a list of questions matching a user's query, for Japanese language
- **Goal:** Effectively model information from the user click logs and relevance based metrics
- **Evaluation:** Offline and Online evaluation



Original Japanese page translated using the Google translation

Main Challenges

- Queries are typically short and ambiguous in nature and might not capture the user's intention effectively
- For example for Japanese query: "喫煙", English translation: "smoking"
  - Possible Query Intention-1: "dangers of smoking"
  - Possible Query Intention-2: "mechanism to quit smoking"
- Complex problem to re-rank the questions without understanding the user's intent and focus of the query
- **Aim:** How to model the aspects of textual relevance and information gained through user click data, to retrieve and present the information effectively to a user

Dataset

- **Dataset:** Yahoo Queries and respective Question-Answers

	Training set	Test set
Number of queries	1,000	1,000
Number of questions	986,125	985,691
Number of click logs	288,502	148,388

Methodology

- **Learning to Rank algorithms:** Explored L2R algorithms including Coordinate Ascent and MART
- **Feature Selection & Combination:** Explored alternative combinations of diverse feature sets capturing relevance of the user query and retrieved ranked list of questions

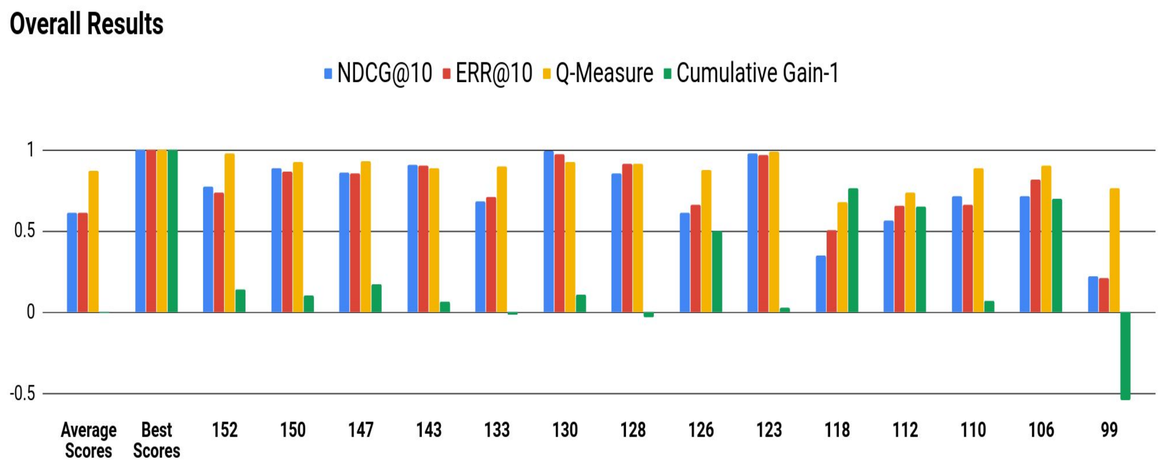
Type of Features	Features Range
Title Based Textual Features (Title set)	[F1-F17]
Snippet Based Textual Features (Snippet set)	[F18-F34]
Question Body Based Textual Features (Body set)	[F35-F51]
Body Answer Based Textual Features (Answer set)	[F52-F68]
Click Log Features (Click set)	[F69-F77]

More detail on the features is provided in the paper

- **Parameter selection:** Varied L2R model parameters to learn effective hypothesis functions from the dataset
- **Scores Normalisation:** The scale of the features (77 features) varies considerably, some features are on logarithmic scales (log-based values), so we performed three scores normalization functions:
  - Z-score normalization
  - Score average
  - Max based normalization

Systems Submission & Results

- Total of 14 systems submitted
- 5 of our systems were selected in top 30 systems to be evaluated in the final phase, out of a total of 65 participant submissions



ID	NDCG@10	ERR@10	Q-Measure	Credit- Phase-1	Credit- Phase-2
106	32	24	26	7	7
112	36	35	64	8	10
118	**45**	**38**	**65**	**4**	**6**
126	34	34	32	14	12
147	21	23	20	29	23

Our top systems' ranking based on different evaluation metrics

Analysis

- Coordinate Ascent algorithm performs relatively better than the Mart algorithm
- Our best system (ID-130) based on NDCG@10 and ERR@10 was ranked "2" and "3" respectively
- Based on Q-scores our best system (ID-123) was ranked "6"
- Based on the cumulative credit our best system (ID-118) was ranked "4" and "6" for online phase-1 and final phase evaluation
- Most of our submissions were heavily tuned to focus on relevance-based features, such as BM25 and LM scores, measuring the similarity of queries with the set of questions to be re-ranked

Findings & Future Work

- Ranking of systems based on the online evaluation metric differed from that for the offline evaluation metrics
- Need for more research to understand the factors behind contrary ranking results arising from the use of online and offline evaluation metrics
- Our best systems in the online phase focused on modelling users click logs. Thus in future work we would like to explore more effective techniques for the exploitation of user logs and click distributions for ranking questions
- Need for further investigation to find online and offline evaluation metrics that correlate well in order to address the task of ranking questions

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For what's next

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