

Ranking answers and web passages for non-factoid question answering

Emory IR Lab @ TREC LiveQA 2015

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Observations

Many questions are similar to
previously posted questions

[How to make vinyl stickers stay permanently?](#)

(I already asked this question but I forgot to add details) I made a sticker with I vinyl cutter and put it on my plastic binder. I really like the way it looks and am scared it's going to peel...

3 Answers • [Do It Yourself \(DIY\)](#)

[What is a vinyl sticker?](#)

Today I bought 3 one direction vinyl stickers for my sister, they're quite small, but what are they for? Are they normal stickers? And do they peel off if u want?

2 Answers • [Do It Yourself \(DIY\)](#)

[How to make vinyl stickers stay permanently?](#)

3 Answers • [Do It Yourself \(DIY\)](#)

[Window vinyl sticker decal didn't work?](#)

I bought a new window decal for my truck and yes I know how to put them on. I have done it before and it worked fine. I bought one from a store and tried putting it on my truck but for some reason ...

1 Answer • [Do It Yourself \(DIY\)](#)

[What type of adhesive will make vinyl wall stickers stay put on textured walls?](#)

Walls have the "orange peel" texture and some of the wall decals are not sticking. Sticky-tac looks like it will work but can I find it in the store or will I need to order it online? I s...

1 Answer • [Decorating & Remodeling](#)

[Resuse vinyl wall stickers?](#)

I have bought some amazing vinyl wall stickers for my daughters room but there is a chance we may move in a year and I wondered if you can reuse them. I read on the website a warm hair dyer can rem...

5 Answers • [Decorating & Remodeling](#)

[How to remove t cut polish from vinyl stickers?](#)

i used t cut polish on my vw beetle which is covered in black vinyl stickers and thee polish has left a white residue all round the vinyl edges, can anyone help with how to remove it, i have washed...

1 Answer • [Maintenance & Repairs](#)

Most questions are based on a "user story"

Travel > Asia Pacific > Philippines

Next >



How can I book a cruise to Southeast asia while living in the Philippines?

Health > Diet & Fitness

Next >



I got a headache after working out?

I don't really exercise but recently I picked it up. I've been going to the gym and yoga but last week I tried a spinning

Home & Garden > Cleaning & Laundry

Next >



I'm addicted to smelling liquid and powder detergent. Is this bad? Please help!?

Pets > Cats

Next >



I ran over my boyfriend's cat!?

When I left his (family's) house i didnt hear, see and realized that his cat was under my car. Anyway when I arrived home he sent me a message telling me that his brother discovered their cat close to death right where I parked my car. I apologized and he told me that it was just an accident, that it was no... [show more](#)

☆ Follow 6 answers

Some questions are unique or it is hard to find similar questions

why doesnt my 10 wk old french bulldog bark?

Search Answers

Search Web

Relevance Newest Most Answers Fewest Answers

Save Search

[Why doesnt my 10 wk old french bulldog bark?](#)

4 Answers • Dogs

Didn't find what you are looking for? Ask a question:

my french bulldog bark

Search Answers

Search Web

Relevance Newest Most Answers Fewest Answers

Save Search

[How can I get my french bulldog to bark/speak on command?](#)

I have a frenchie that is just about 9 months and has only barked maybe three times. Every now and then she will bark in her sleep. She has barked twice when people have been outside the house, Lat...

1 Answer • Dogs

[French bulldogs ... Barking & snorting?](#)

Does anyone know what their different types of barks & snorting means? I know the different types they do is there way of talking to u but how do u know whats what?

1 Answer • Dogs

[French Bulldogs?](#)

I got answers on English Bulldogs, but I am wondering about French Bulldogs. They are smaller, but I have heard that they dont have as many health problems as the English Bulldogs. I dont know if t...

3 Answers • Dogs

[Why can't french bulldogs bark normally?](#)

weird bark

2 Answers • Dogs

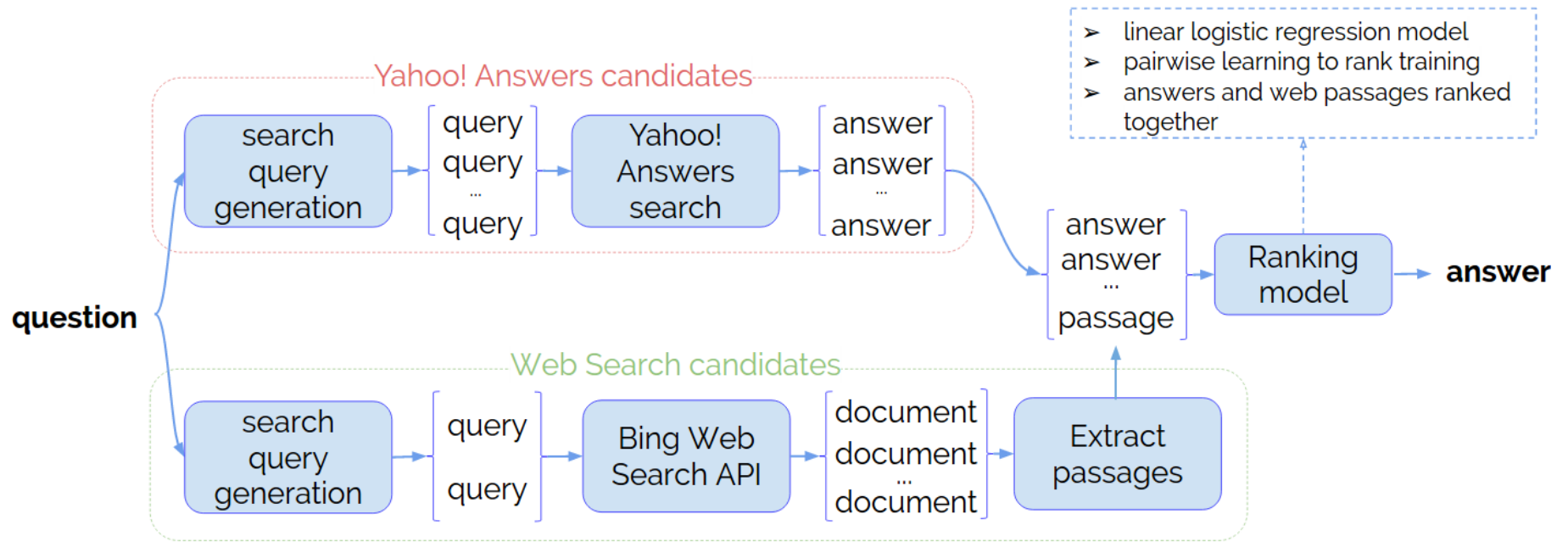
[Am i right for a french bulldog?](#)

i really wanna dog. I am only 13, but am a very responsible guy. I intend on getting a french bulldog. Would I be able to play tackle, or wrestle (i'll take it way easy of course) or other pla...

6 Answers • Dogs

System Architecture

System overview



Query generation strategies

- **Yahoo! Answers**
 1. question title (with and without stopwords)
 2. question title & body
 3. question title (w/ body) & question category
 4. top 5 tf-idf terms from title (w/ body)
- **Web search**
 1. question title
 2. question title & body

Candidate Ranking

- candidates are ranked using linear logistic regression model
- the model is trained on WebScope collection of Yahoo!
Answers pairs with pairwise ranking objective
- no distinction between candidates from different sources

Features

- answer statistics (length in chars, tokens, sents, etc)
- BM25 scores (using title or title + body as query)
- term matches features (number of matches, maximum spans of matched terms, etc.)
- question and retrieved question categories match
- bag of word pairs from question and candidate answer
- statistics of NPMI between question and answer terms
- score computed by an LSTM neural network model

Normalized PMI

$$npmi(q_i; a_j) = \frac{pmi(q_i; a_j)}{-\log p(q_i, a_j)}$$
$$pmi(q_i; a_j) = \log \frac{p(a_j/q_i)}{p(a_j)}$$

- computed on WebScope Yahoo! Answers collection

NPMI scores: diabetes

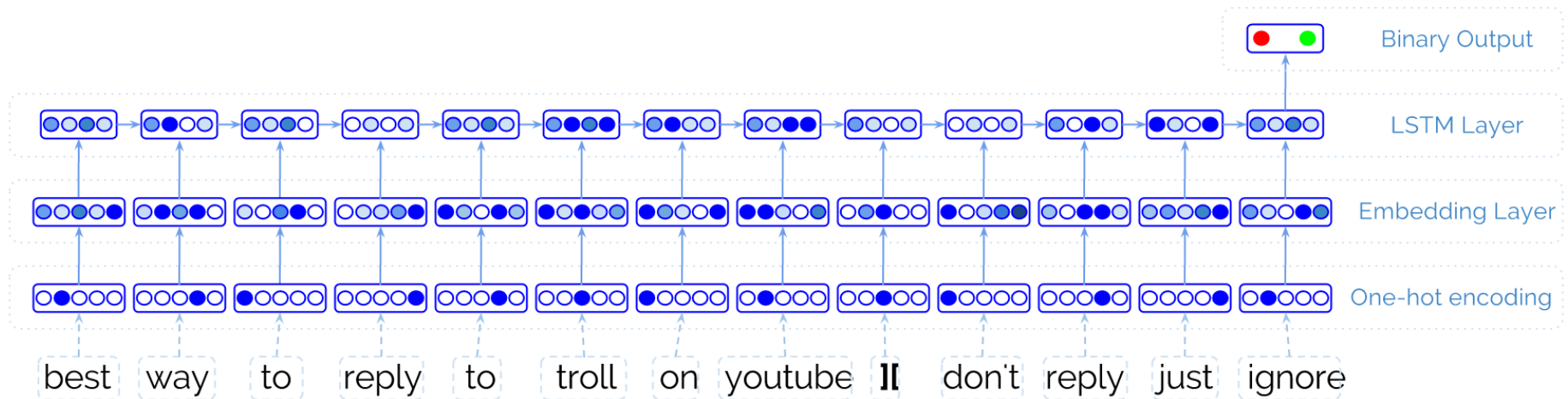
term	score
diabetes	0.70858
insulin	0.62824
glucose	0.55582
niddm	0.55183
hyperglycemia	0.54767
mellitus	0.54400
insulin-dependent	0.54332
pancreas	0.54290

NPMI scores: install

term	score
install	0.52456
setup.exe	0.44842
partition	0.40844
xp	0.39632
ubuntu	0.38734
bootable	0.37943
distros	0.36809
windows	0.35734

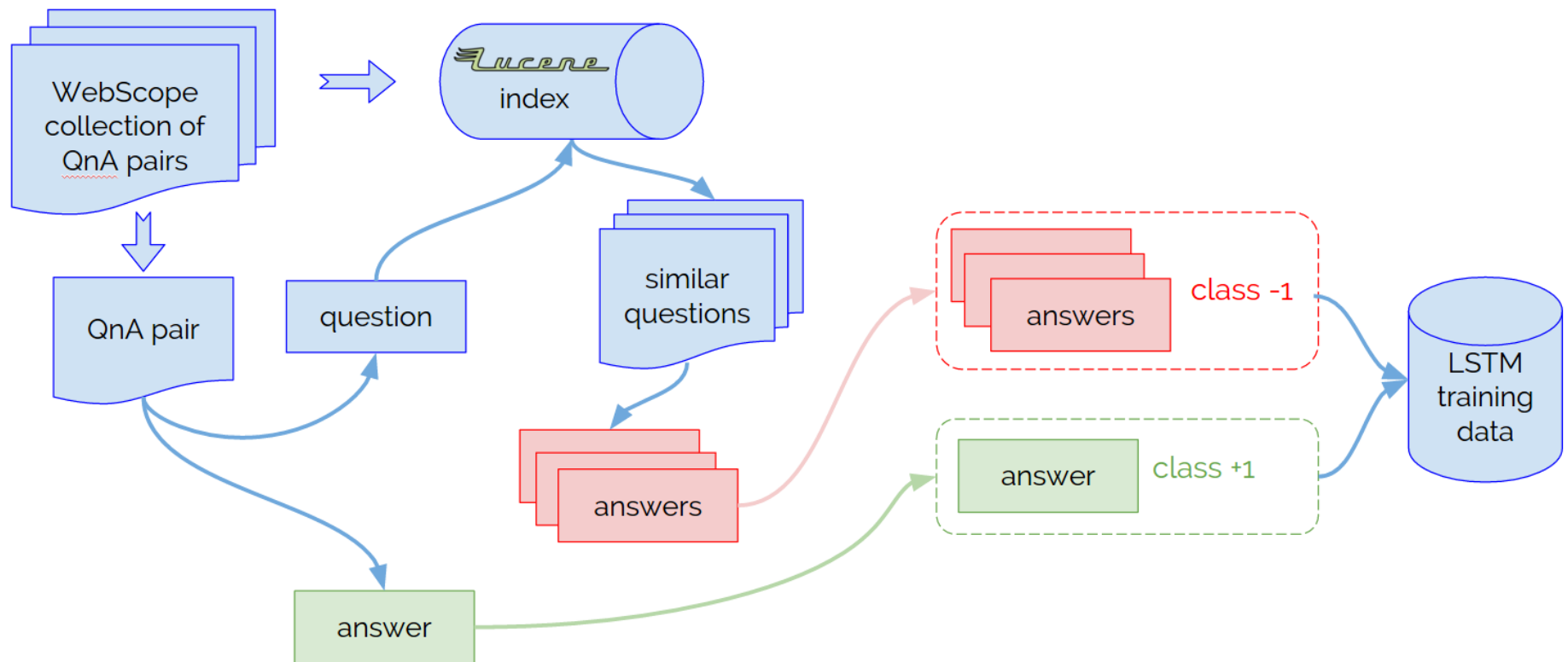
LSTM model

- Simple NN to produce a joint representation of QnA pair
- This representation is used to predict how likely the candidate answers the question



Training

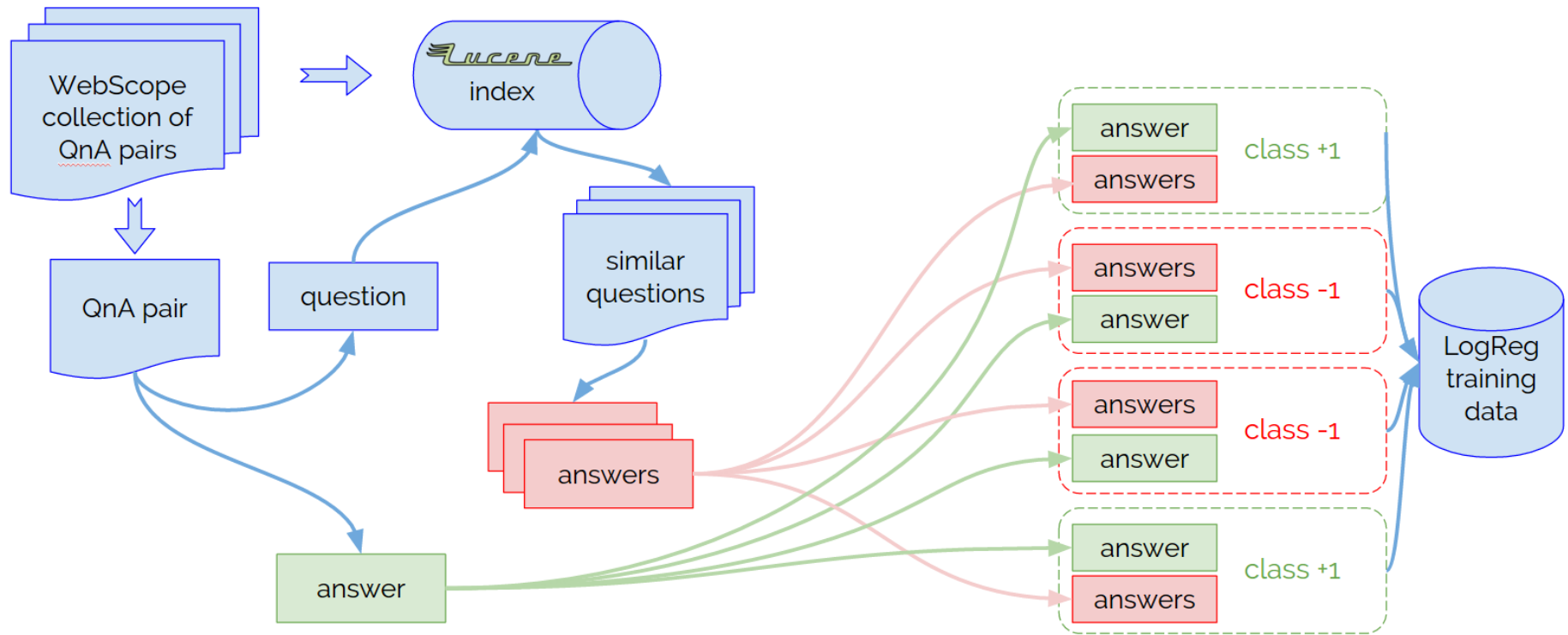
LSTM network training



LSTM network training

- Implemented using Keras library
- Trained using stochastic gradient descent with Adam optimization technique
- Embedding and hidden layer of size 128
- Vocabulary of 1M words
- Total of 10K QnA pairs, batch size of 200 for 100 epochs

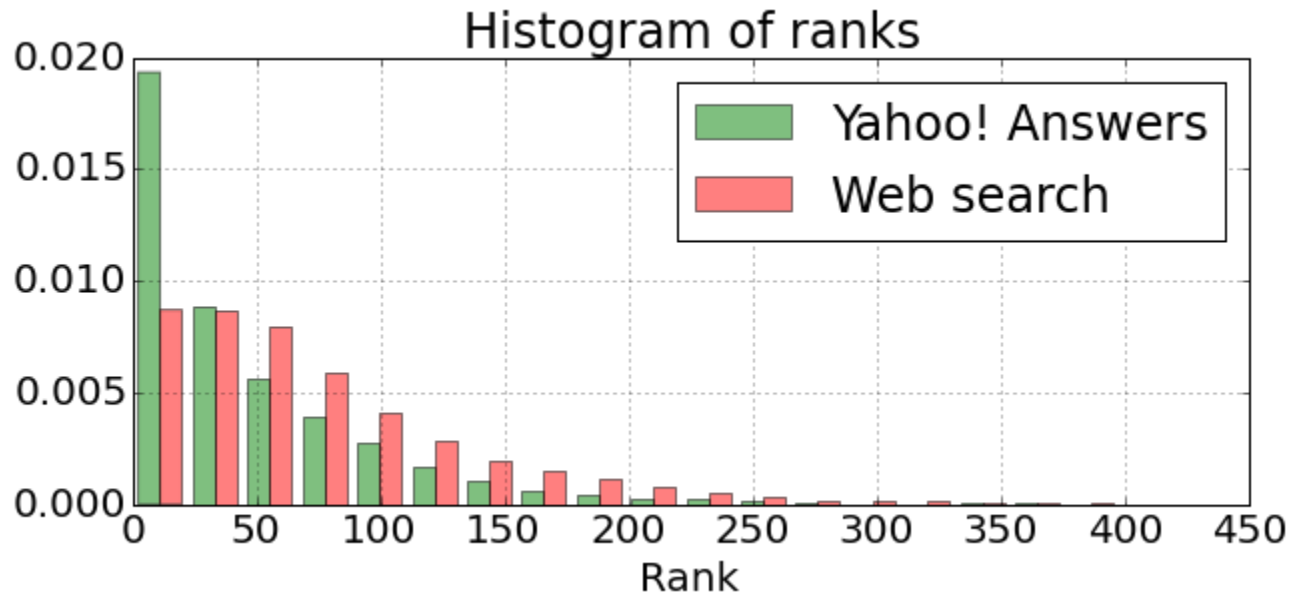
Logistic regression training



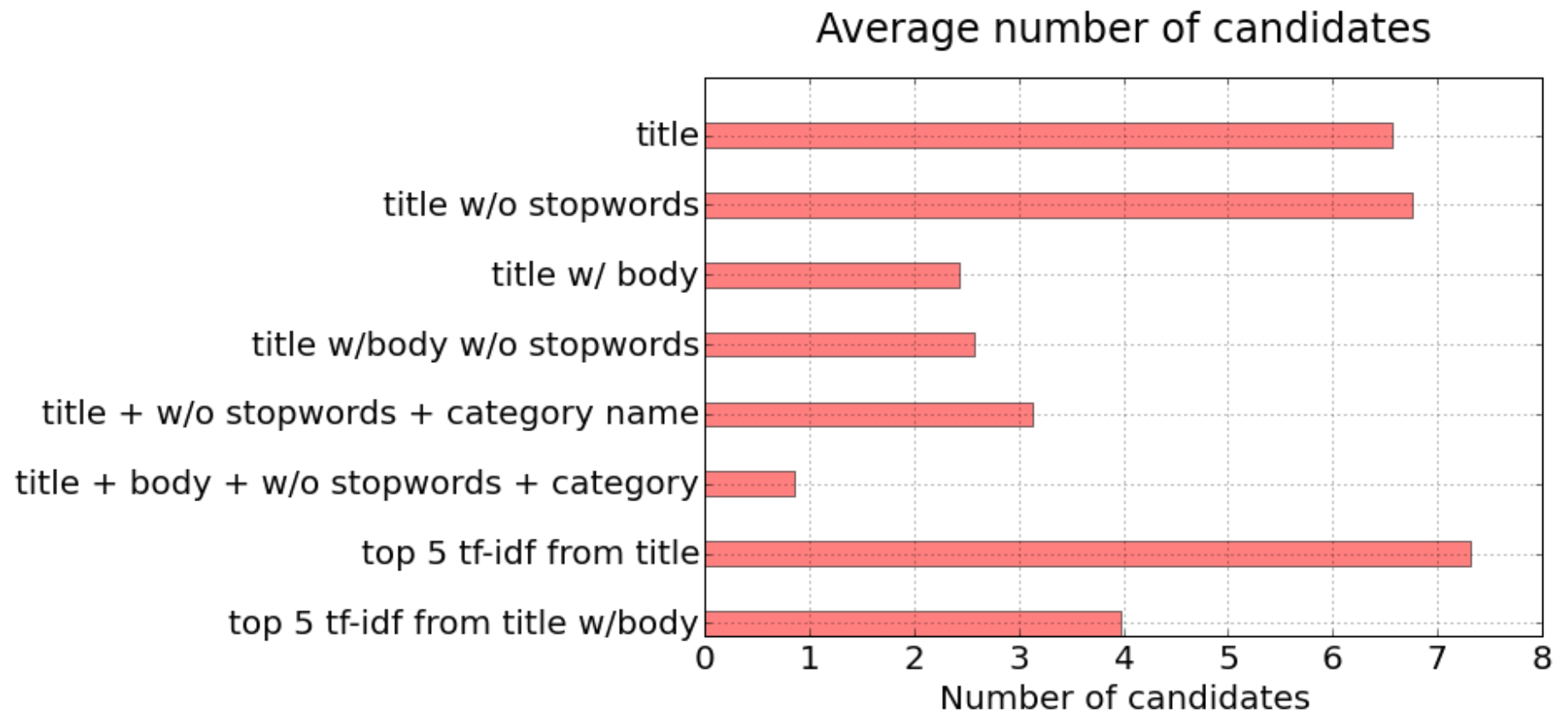
Evaluation

Answer candidates

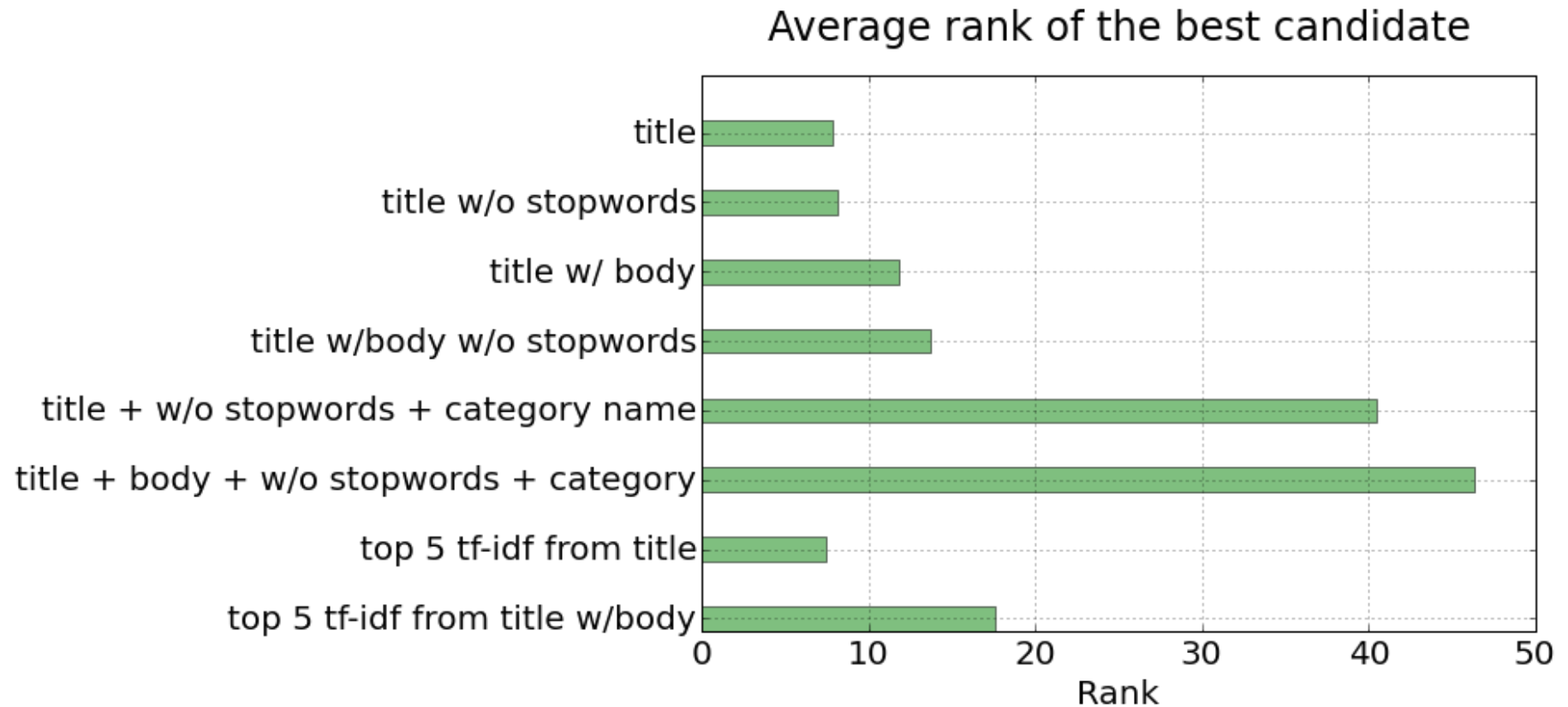
.	Yahoo!Answers	Web
Average # of candidates	33.63	67.50
Average model score	-15.18	-20.50
How often no candidates	0.14	0.02



Avg number of candidates: Y!A

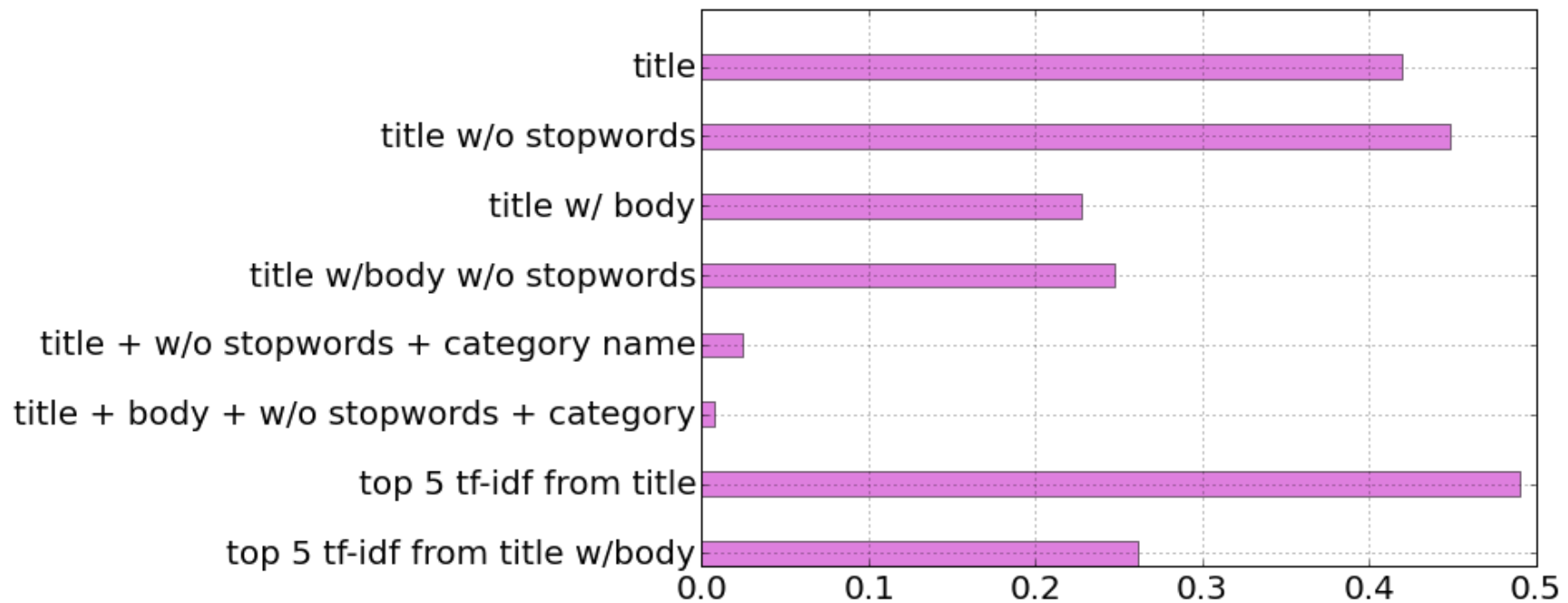


Rank of the best candidate: Y!A



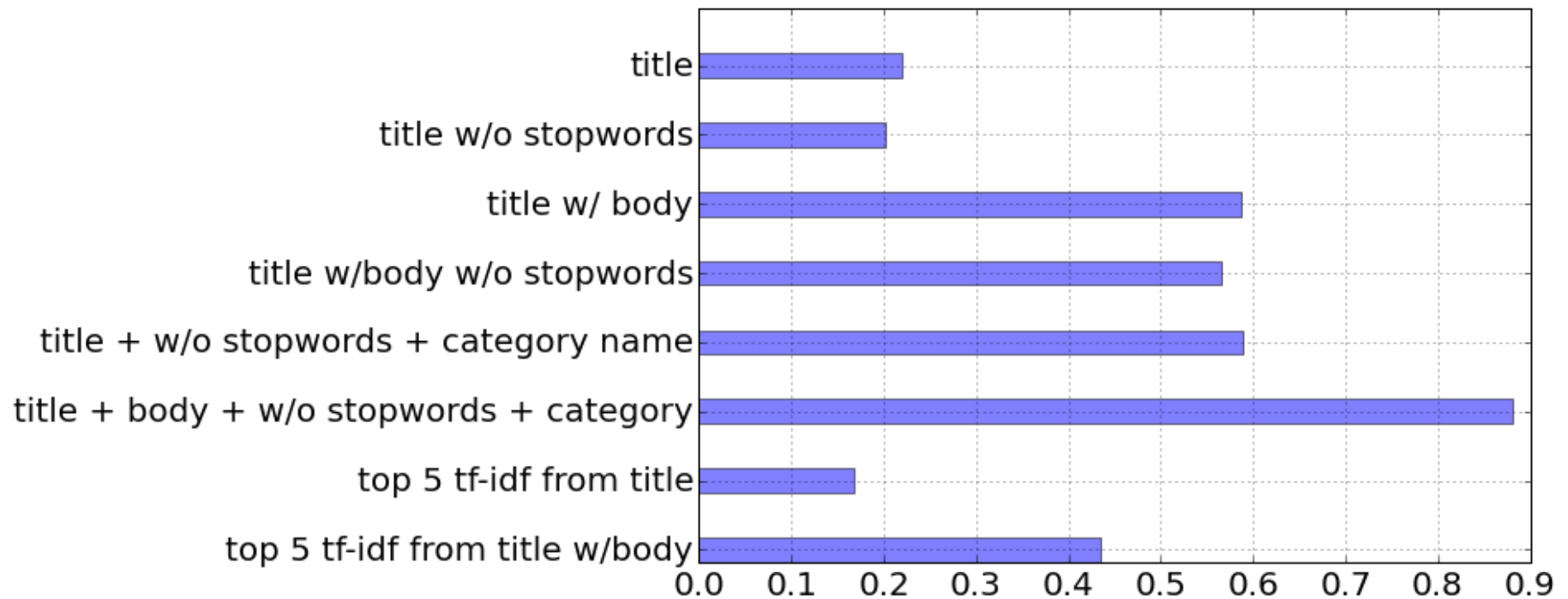
How often the candidate was selected: Y!A

Fraction of questions when a candidate was selected



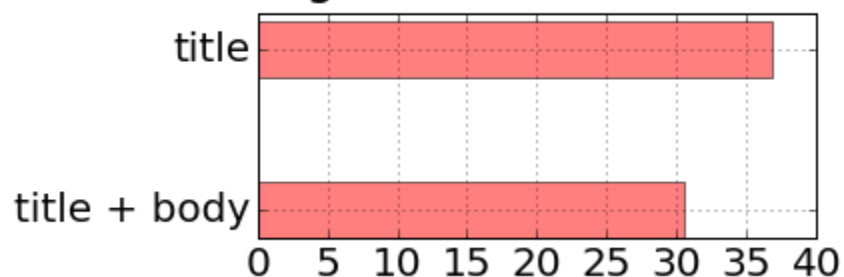
Fraction of questions without candidates: Y!A

Fraction of questions with no candidates

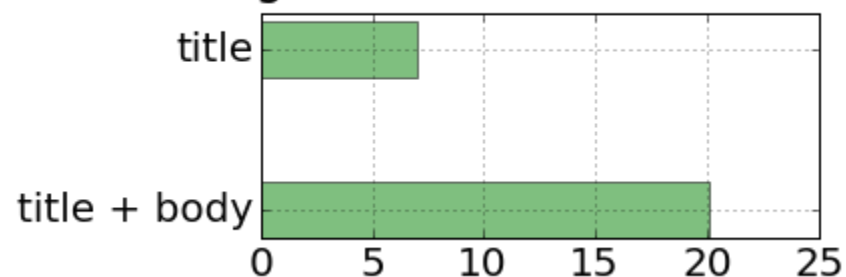


Query generation statistics for web

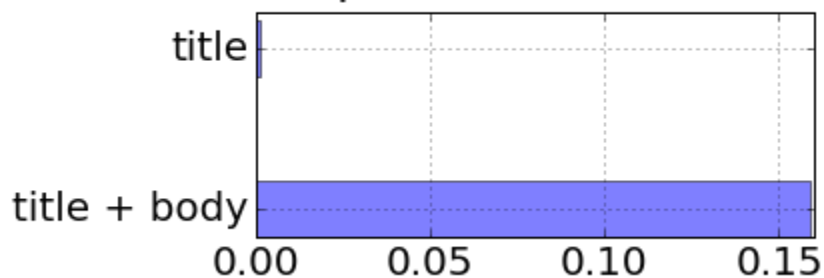
Average number of candidates



Average rank of the best candidate

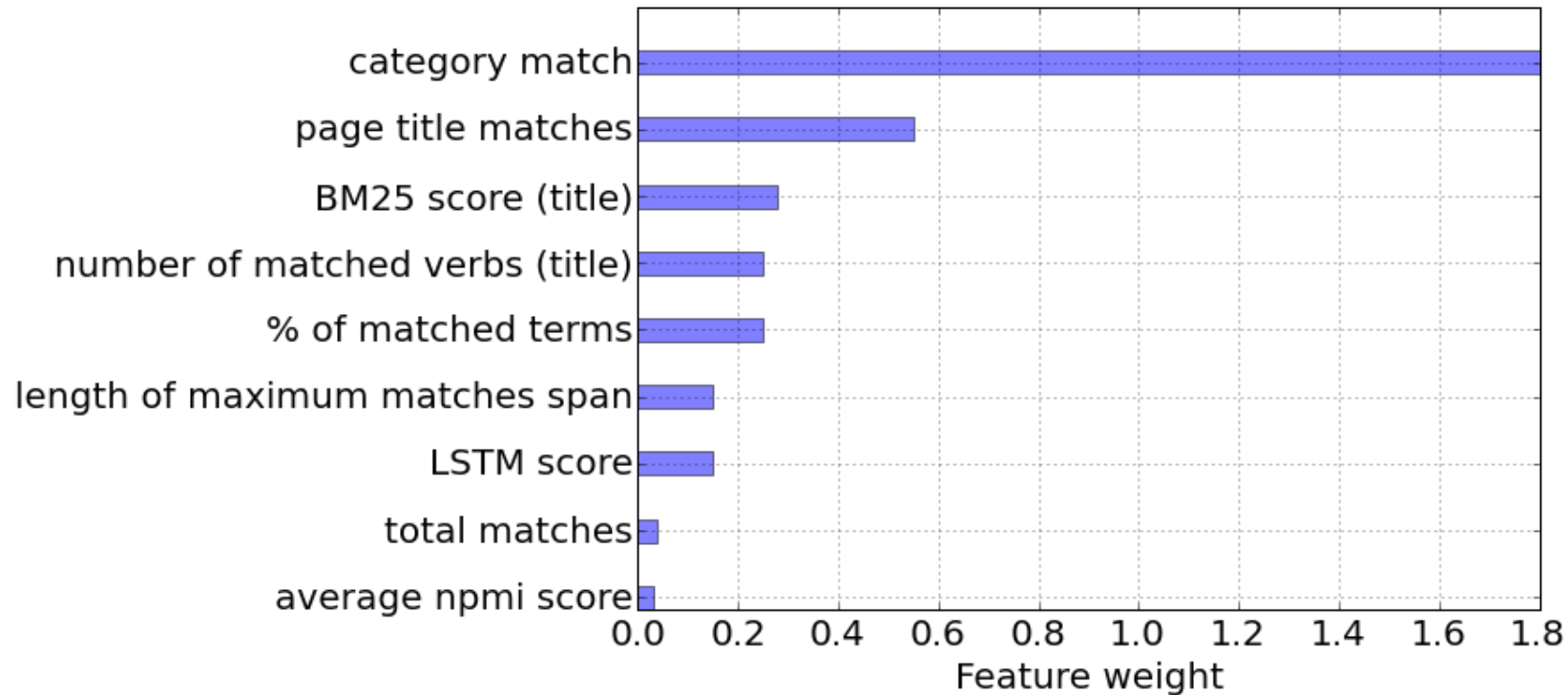


Fraction of questions with no candidates



Feature importance

Weights of top features of ranking logistic regression model



* *category match feature is overfitted as in training category always match*

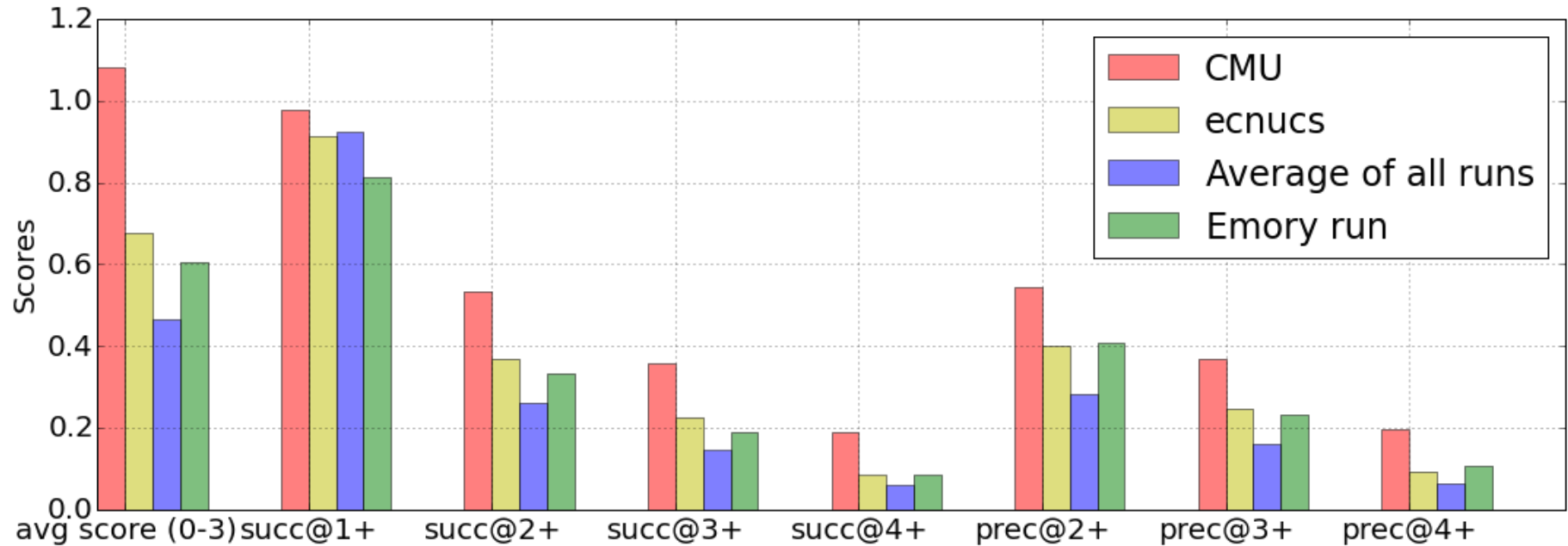
Evaluation run statistics

1087 questions were judged

score	explanation
4 Excellent	fully answers the question
3 Good	partially answers the question
2 Fair	marginally useful information
1 Bad	contains no useful information for the question
-2	the answer is unreadable

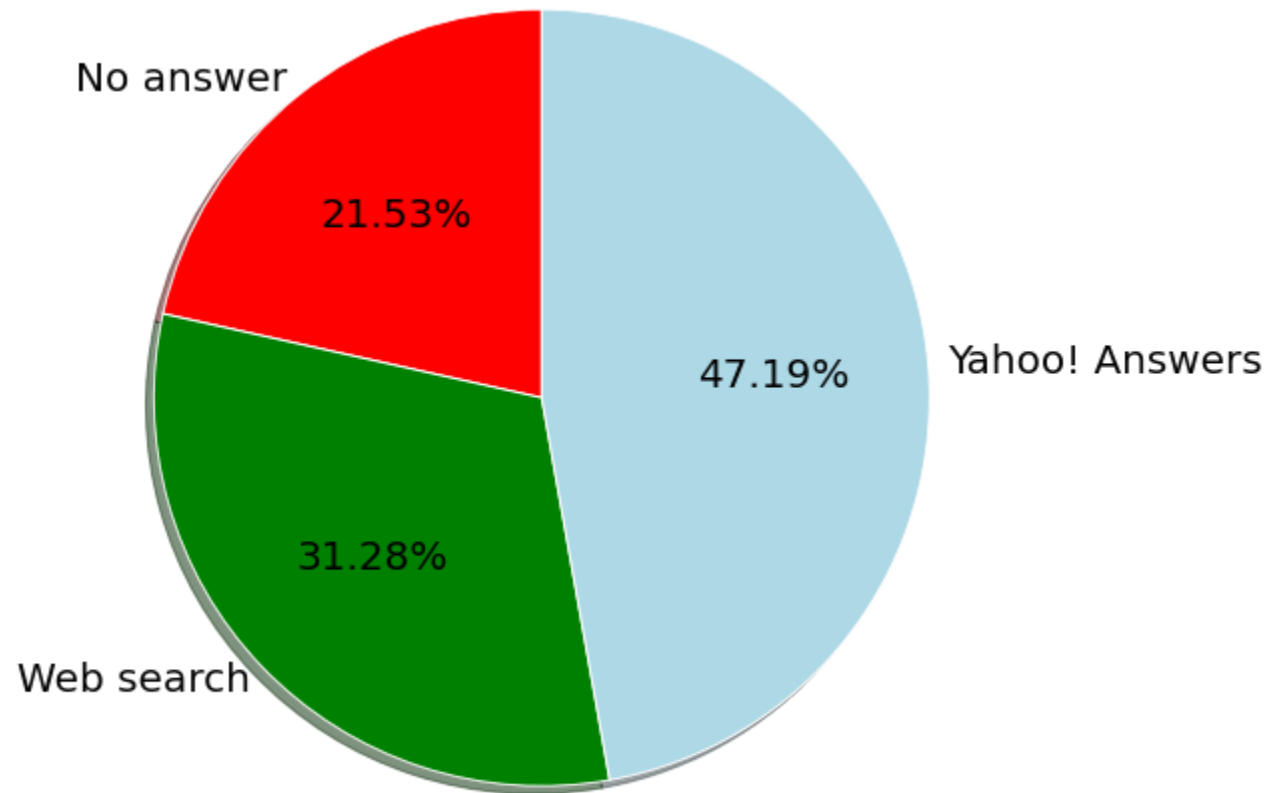
Scores

Emory system and average performance metrics



- avg-score(0-3) - average score over all queries
- succ@i+ - fraction of questions with i+ score
- prec@i+ - fraction of answers with i+ score

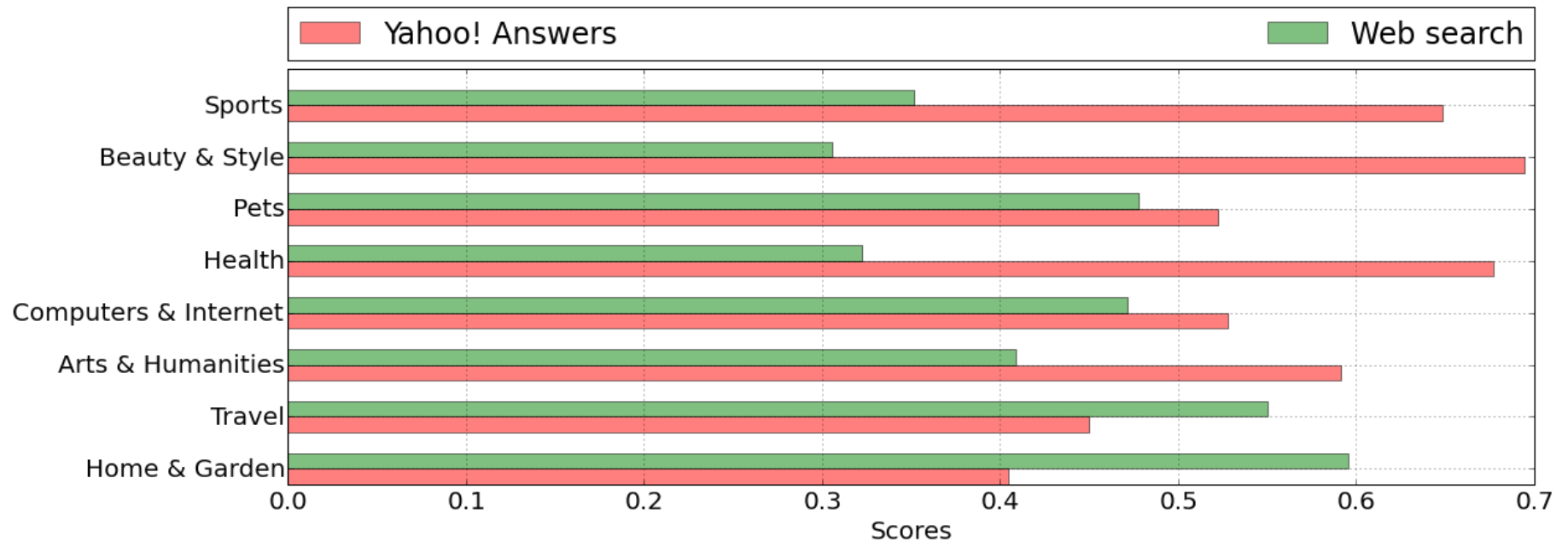
Majority of answers came from Yahoo! Answers



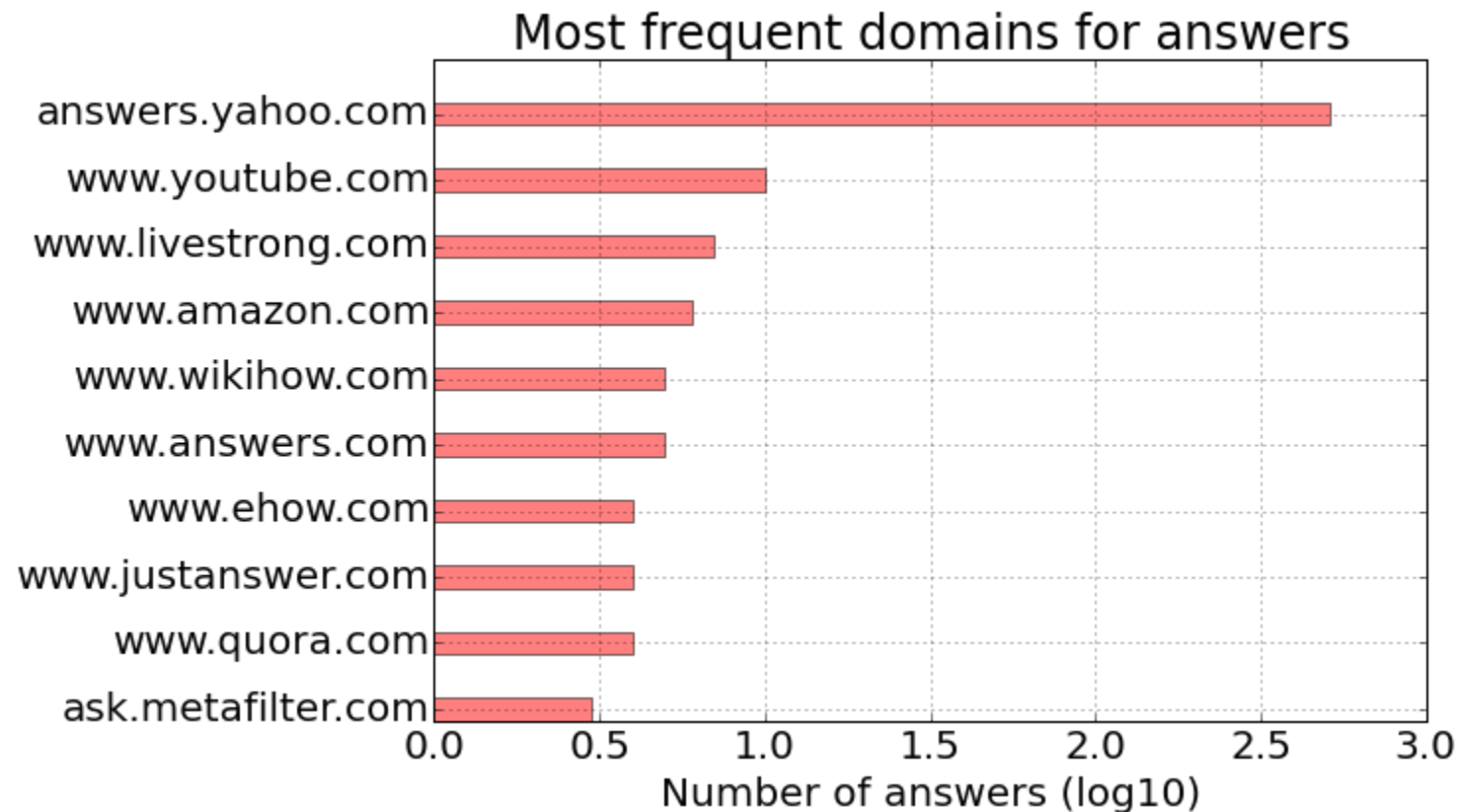
Answer source statistics

For some categories web search was more useful

Number of answers per each data source

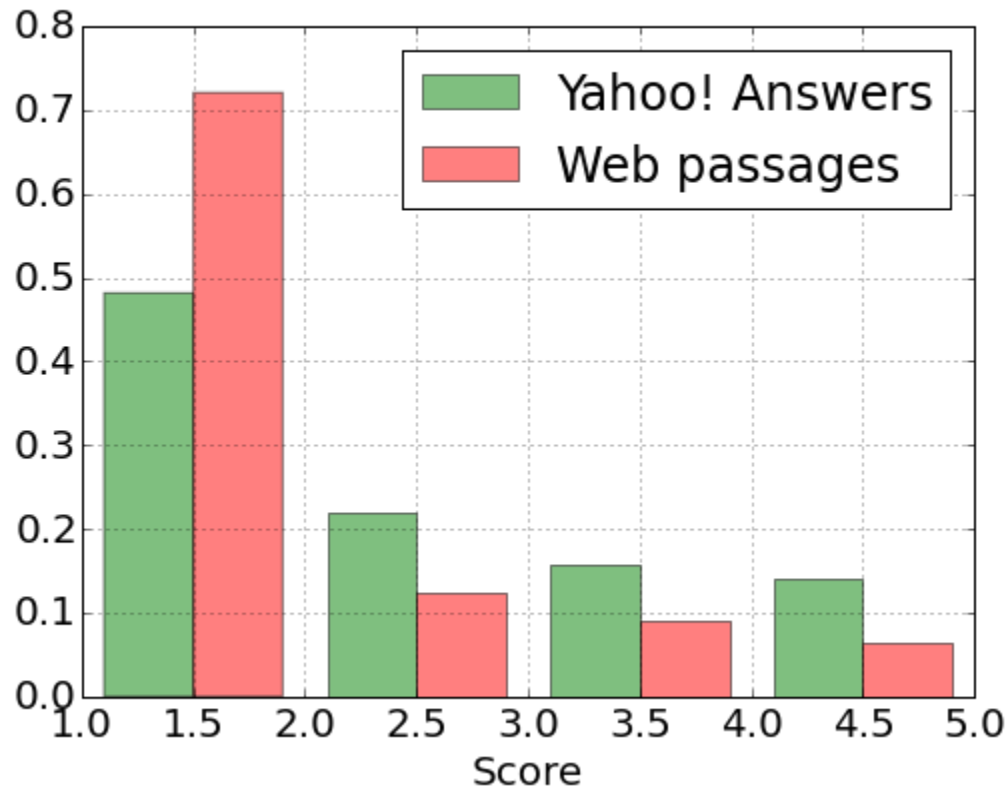


Many other CQA website domains



Quality of answers from Y!A is better


Normalized histogram of scores for answer source types



Examples

Similar questions


Home & Garden > Cleaning & Laundry Next >

 **I'm addicted to smelling liquid and powder detergent. Is this bad? Please help!?**

Ok, so I'm only 14 and not pregnant or anything. (I've searched craving the smell.. Not meant to offend anyone!) But I love the smell of febreze, Lysol, and really every kind of handwashing s

[☆ Follow](#) [1 answer](#)


Health > Other - Health Next >

 **I'm addicted to smelling laundry detergent...is this bad?**

I don't eat it or anything...I just like to smell it. It's the powder kind. I think it smells really good. And I'm always happy to do laundry because I get to smell the detergent.

[☆ Follow](#) [1 answer](#)

Answers

 **Best Answer:** I don't see a problem with laundry detergent, it could be something much worse but to break yourself I would buy the liquid or buy the kind with no smell. I don't know any long term affects of smelling detergent but I would want to know how to stop.


Source(s):
retired paramedic

[Medicine Woman](#) · 6 years ago



[👍 1](#) [👎 0](#) [Comment](#)

Non-similar questions


Health > Diet & Fitness Next >



 I want to start going gym. I'm a male who wants to build muscle and get a bigger body but I have no idea where to start.?

Anyone able to help me? Maybe show me your workout routine


 Follow  2 answers

Family & Relationships > Singles & Dating Next >



 Why didn't Elliot Rodger, the mass shooter guy, just go to the gym & build big muscles so pretty girls would like him?

 Follow  1 answer

Answers

 **Best Answer:** Big muscles don't fix personality faults.

[Carlos](#) · 1 year ago

 1  0 Comment

Asker's rating *****

Non-similar questions

Arts & Humanities > Books & Authors

Next >



Is there a section for the subject of writing?

Update: I mean specifically..

☆ Follow 3 answers

Yahoo Products > Yahoo Mail > Other - Yahoo Mail



I can't write in the To: Cc: Subject: section?

☆ Follow 1 answer

Answers



Best Answer: try downloading google chrome, maybe the problem is internet explorer
thnx =)

Candy Cream · 6 years ago




Not-useful answer


Beauty & Style > Other - Beauty & Style Next >

 I think average height for men like 5'11 and 6 feet is sexier than taller ones. What do you think?



As you see most of the hottest men are a etc.

 Follow  3 answers


Entertainment & Music > Polls & Surveys Next >

 I think average height for males like 5'11 and 6 feet is more sexier than taller ones. What do you think?



Most of the hot guys are around this height. Like brad pitt, johnny depp, orlando bloom, jamie dornan and etc.

 Follow  2 answers

Answers Relevance ▾


 Agreed

Asep the king · 3 months ago

 0  0 Comment

Answer from the web

Pets > Rodents Next >



Scatter feeding my hamster?

I always leave 1/4th to 1/2 of her bowl filled with... give her something to do, underneath toys... she buries it... is she eating it later? Her bowl...

[Follow](#) [2 answers](#)

Scatter feeding my hamster?

[Relevance](#) [Newest](#) [Most Answers](#) [Fewest](#)

[Scatter feeding my hamster?](#)

I always leave 1/4th to 1/2 of her bowl filled at all her something to do, underneath toys, inside toys
[2 Answers](#) • [Rodents](#)

[Hamsters & supplies????????????????????????????????????](#)

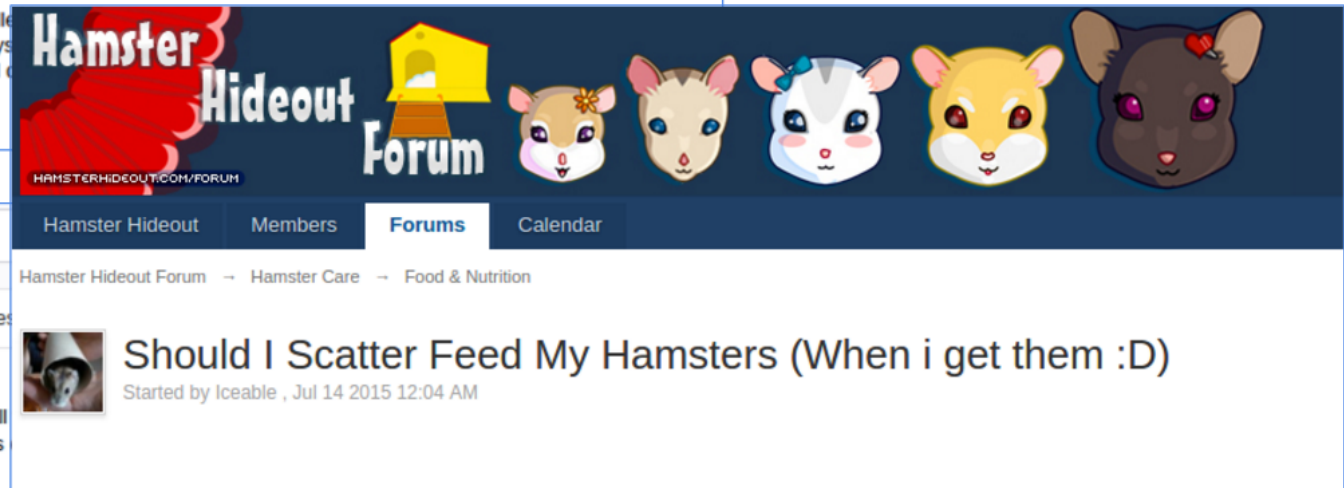
Ok, so I might possibly get a dwarf hamster. My question is: Do I buy all the supplies with the hamster at once, or do I prepare the cage and bedding and food, and then bring it to the store to buy...
[2 Answers](#) • [Rodents](#)

[Is it okay to feed my Hamster cabbage?](#)

I've tried feeding my hamster carrots, cabbage, and cucumber, but the only one he likes is cabbage. He doesn't just "like" it, he loves it. I rip tiny pieces but is it okay to feed...
[6 Answers](#) • [Rodents](#)

[Hamsters? Need information! Help!?](#)

My child wants a hamster. What care do they need? Are they good pets for children? Any details, what they require? Please help. Thx What about Guinea pigs? Are those better?
[8 Answers](#) • [Rodents](#)



The screenshot shows the 'Hamster Hideout Forum' website. The header features the forum name and a navigation menu with 'Hamster Hideout', 'Members', 'Forums' (selected), and 'Calendar'. Below the header, there are five hamster avatars. The main content area shows a forum thread titled 'Should I Scatter Feed My Hamsters (When i get them :D)' started by 'Iceable' on Jul 14 2015 12:04 AM. The thread includes a small image of a hamster and a question about scattering feed.

Conclusions

- answers to previously posted similar questions can be effectively reused to answer new questions
- query generation strategies for CQA and web search are important as LiveQA questions are long
- term matches-based features are the most useful in our model. It will most likely benefit from “better” text similarity features: translation models, n-grams, tree kernels, etc.4
- there is a huge room for improvement: only ~20% of questions were answered fully or partially

Thank you! Questions?