Grimjack at Touché 2022

Advanced IR, Winter Semester 2021/22

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Task at hand

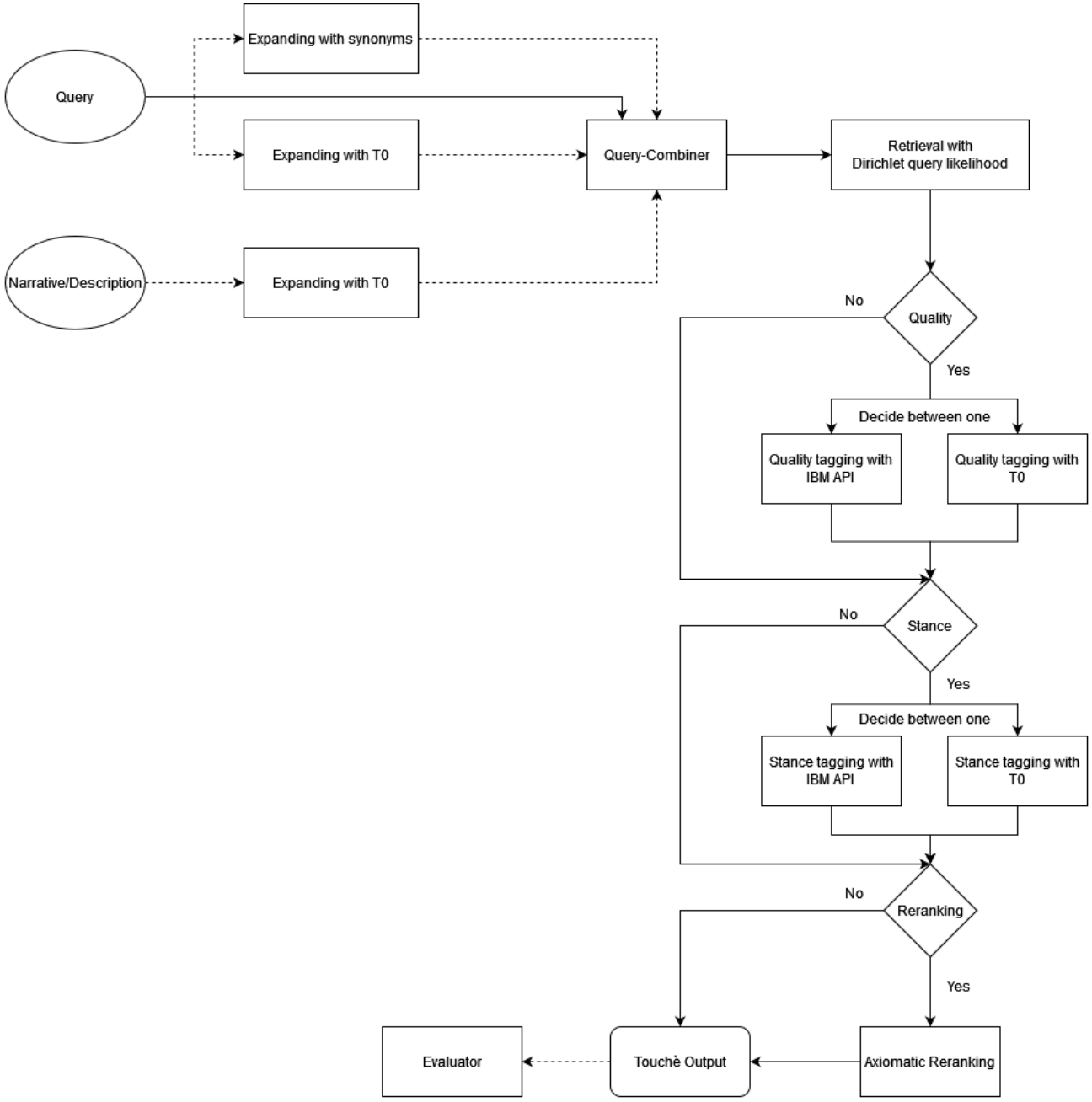
- Task 2 of Touché: Argument Retrieval
- Argument Retrieval for Comparative Questions
- Task: Retrieve relevant passages to answer comparative questions and detect their stance w.r.t the objects
- Data: > 1 million text passages

https://mobile.twitter.com/webis_de/status/1468529926026534913?cxt=HHwWgoC97fyLouEoAAAA

General approach

- Programmed in Python
  - Easy to use
  - High readability
  - Many IR libabries available
- Three modules: Search, Search-all and Evaluate-all
- Pipeline consists of
  - Query-Expander and Query-Combiner
  - Initial Retrieval
  - Argument quality and stance tagging
  - Reranking
- Each pipeline step can be activated/deactivated
- Indexing and initial retrieval via pyserini [Lin+21]

Pipeline


Query
Expanding with synonyms
Expanding with T0
Narrative/Description
Expanding with T0
Query-Combiner
Retrieval with
Dirichlet query likelihood
Quality
No
Yes
Decide between one
Quality tagging with
IBM API
Quality tagging with
T0
Stance
No
Yes
Decide between one
Stance tagging with
IBM API
Stance tagging with
T0
Reranking
No
Yes
Evaluator
Touchè Output
Axiomatic Reranking

Query-Expander and Query-Combiner

- Expanding queries with synonyms of comparative objects
- Two Different approaches
  - Based on embeddings with glove
  - Based on language model T0 [San+21]
  - We ask "What are synonyms of the word <token> ?"
- With T0 also new queries from narrative and description
- We ask "Extract a query: <text>"
- Combining all new queries with OR
- Retrieving ranked list of passages with this new query

Argument quality tagging

- Extracting arguments with TARGER [Che+19]
- For each argument we want to know the quality w.r.t. the topic
- Two different approaches
  - Based IBM Debater API [Tol+19]
  - Based on T0
  - We ask "<sentence> How would you rate the readability and consistency in this sentence? very good, good, bad, very bad"
- IBM API returns a score between 0 and 1
- 0 means lowest quality and 1 highest quality

Example

Arg: Cars should only provide assisted driving, not complete autonomy
Topic: We should further explore the development of autonomous vehicles
Score: 0.7256

Argument stance tagging

- Next we want to know the stance w.r.t. the topic
- Two different approaches
  - Based on IBM Debater API [Bar+17]
  - Based on T0
  - We ask "Is this sentence positive or negative with respect to <comparative_object>? <sentence>"
- It is also possible to expand with sentiments
- Both approaches only work for single target stance
- Calculating the multi target stance
  - Calculate the difference between objects
  - Use a threshold
  - Convert T0s output into a numerical representation

Reranking

- Foo

Final Remarks

- Approach is very flexible
- We investigate influence of components w.r.t the retrieval score
- Stance classification may be better with Roberta approach
- We cannot distinguish between neutral and no stance
- We investigate how reranking influences the retrieval score
- T0 solves a lot of IR tasks
- Is it possible to only use T0 for retrieval?

Thank you!

References

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- Sanh, Victor et al. (2021). “Multitask Prompted Training Enables Zero-Shot Task Generalization”. In: *CoRR* abs/2110.08207. arXiv: 2110.08207.
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