Knowledge-Based Question-Answering in Human Robot Interaction (KB-QA in HRI)

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Problem statement

- **Question-answering type 1**
  - Who is the president of America?
    - Barack Obama
  - How old is Obama?
    - 54 years

- **Question-answering type 2**
  - Who is the president of America?
    - Barack Obama is the president.
  - How old is Obama?
    - He is 54 years.
State of the art: KB-QA

- Semantic Parsing via Staged Query Graph Generation: Question Answering with Knowledge Base[1]
  - Deep learning

- Answering Natural Language Questions via Phrasal Semantic Parsing[2]
  - Directed Acyclic Graph (DAG)
  - Entity: wikipedia miner tool
  - Relation: PATTY

What is the capital of America?

Washington is the capital of America.
NLG

- **Answer template**
  - It+verb+answer
  - Phrase+verb+answer
  - Answer+verb+phrase
  - They+verb+answer
  - Answer

- **Feature**
  - Question: question word type, verb type, phrase structure type, entity type, length.
  - Answer: answer type, answer count.

- **Dataset**
  - QALD-2


**Dataset**

**KB-QA**

**Step 1:**
- Stanford Dependency parsing
- Entity linking (lookup), DBpedia Spotlight

**Step 2:**
- Semantic similarity

Who is the president of Singapore?

Entity: Singapore (Class: country)
- Singapore (Class: Film)
  - ... Relation: president

Entity: Singapore (Class: country)
- Relation: leader,

Stanford CoreNLP: http://stanfordnlp.github.io/CoreNLP/
Lookup (lucene): https://github.com/dbpedia/lookup
DBpedia Spotlight: https://github.com/dbpedia-spotlight/dbpedia-spotlight
Result

- Two kinds of question answering
Future work

- More render template
- KB-QA
- ...
Thanks!

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