

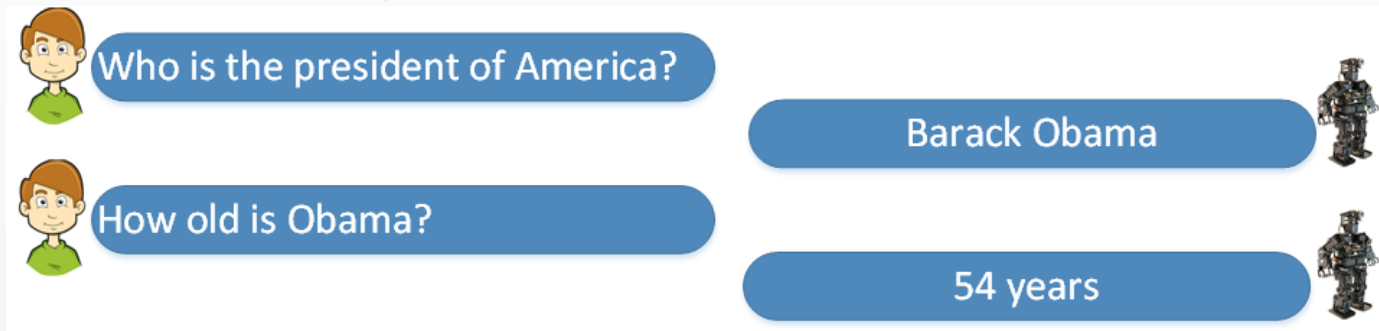
Knowledge-Based Question-Answering in Human Robot Interaction(KB-QA in HRI)

Wang, longbao



Problem statement

◆ Question-answering type1



Who is the president of America?

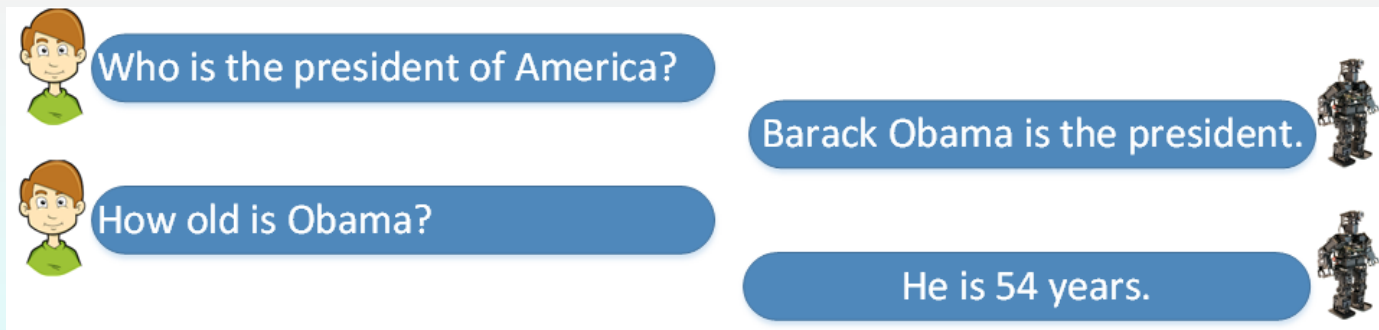
Barack Obama

How old is Obama?

54 years

The diagram illustrates a question-answering process. It features two question boxes on the left, each with a cartoon boy icon. The first question is 'Who is the president of America?' and the second is 'How old is Obama?'. To the right of each question is a corresponding answer box. The first answer is 'Barack Obama' and the second is '54 years'. Small robot icons are positioned to the right of each answer box.

◆ Question-answering type2



Who is the president of America?

Barack Obama is the president.

How old is Obama?

He is 54 years.

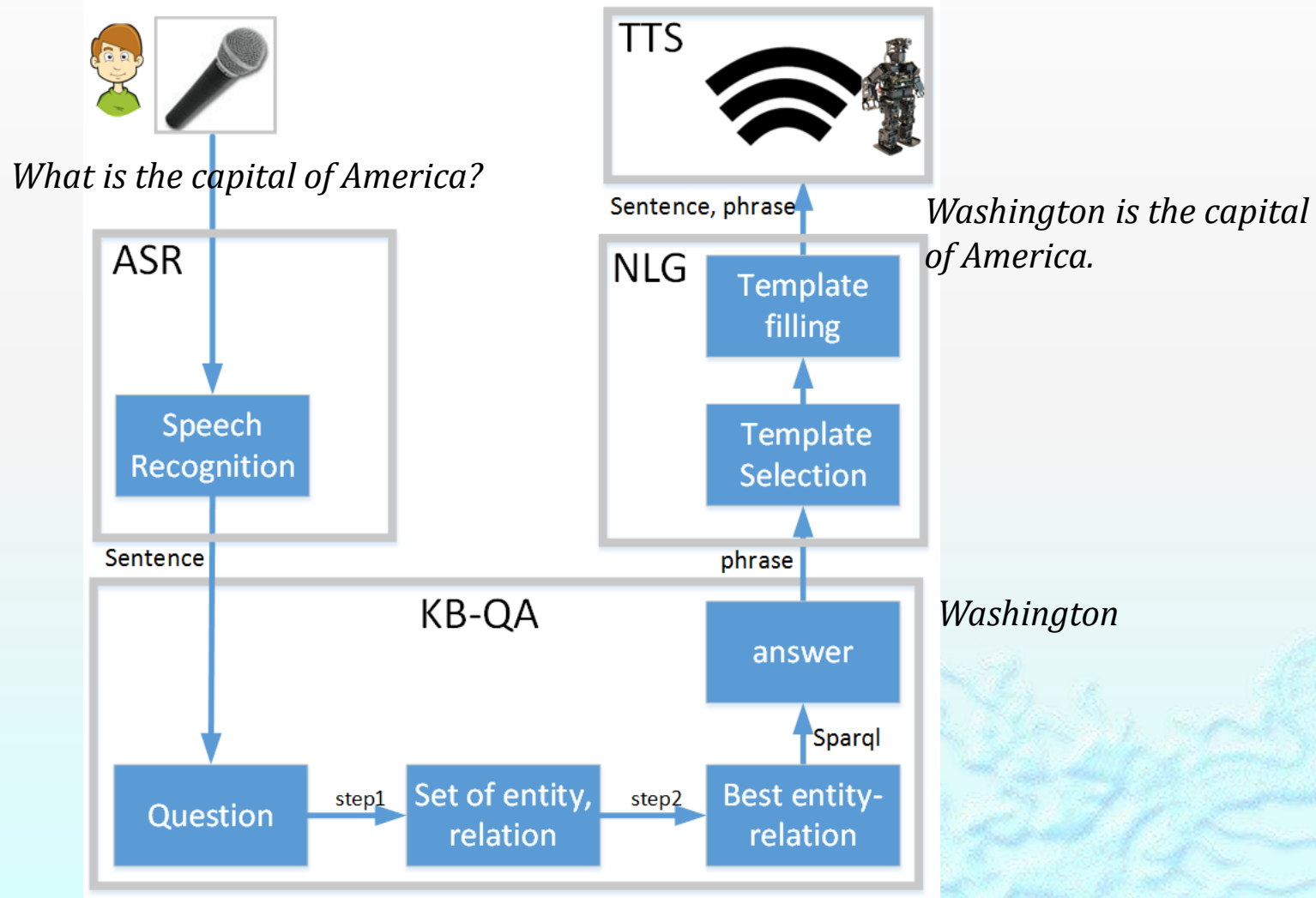
The diagram illustrates a question-answering process. It features two question boxes on the left, each with a cartoon boy icon. The first question is 'Who is the president of America?' and the second is 'How old is Obama?'. To the right of each question is a corresponding answer box. The first answer is 'Barack Obama is the president.' and the second is 'He is 54 years.'. Small robot icons are positioned to the right of each answer box.

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

- ◆ [1] W.-T. Yih, M.-W. Chang, X. He, and J. Gao, "Semantic Parsing via Staged Query Graph Generation: Question Answering with Knowledge Base," *Acl*, 2015.
- ◆ [2] Xu, Kun, et al. "Answering natural language questions via phrasal semantic parsing." *Natural Language Processing and Chinese Computing*. Springer Berlin Heidelberg, 2014. 333-344.

System Overview



NLG

◆ Answer template

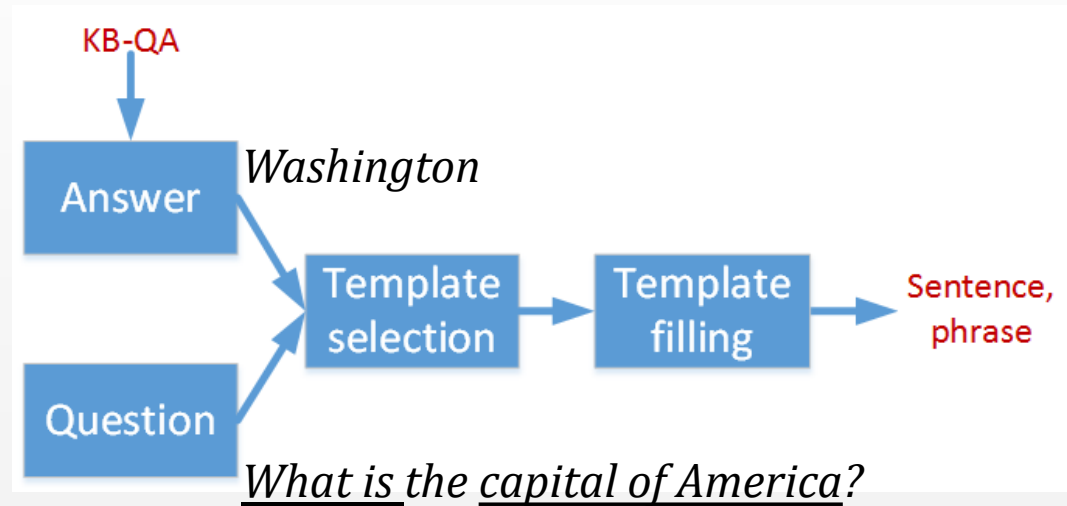
- ◆ It+verb+answer
- ◆ Phrase+verb+answer
- ◆ Answer+verb+phrase
- ◆ They+verb+answer
- ◆ Answer

◆ Feature

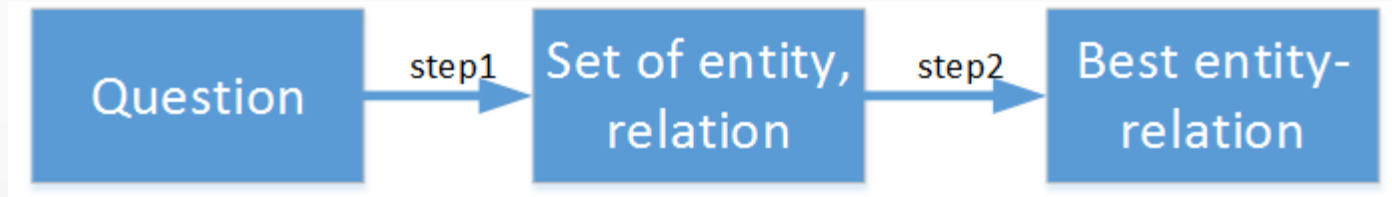
- ◆ Question: question word type, verb type, phrase structure type, entity type, length.
- ◆ Answer: answer type, answer count.

◆ Dataset

- ◆ QALD-2



KB-QA



Who is the president of singapore?

Entity:
singapore(Class:country)
singapore(Class:Film)
...
Relation: president,

Entity:
singapore(Class:country)

Relation: leader,

- ◆ Step1:
 - ◆ Stanford Dependency parsing
 - ◆ Entity linking(lookup), DBpedia Spotlight
- ◆ Step2:
 - ◆ Semantic similarity

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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