

Automated Question Generation for Quality Control in Human Computation Tasks

Dominic Seyler*, Mohamed Yahya*, Klaus Berberich*, Omar Alonso†

*Max-Planck Institute for Informatics
{dseyler, myahya, kberberich}@mpi-inf.mpg.de

†Microsoft
omalonso@microsoft.com

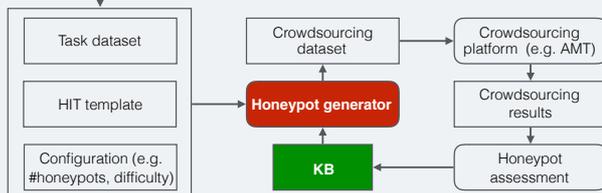
Motivation

- Honeypots are important for judging worker quality in a crowdsourcing setting.
- Honeypot generation is a time-consuming task that we want to automate.

Solution

- Automated generation of honeypot questions.
- Multiple choice honeypots, with a correct answer and multiple distractors.
- Honeypot questions can be generated with varying difficulty: easy/difficult.

System Overview



Example

Task: annotation of entities in documents

Given a document with named entity annotations and candidate entities from a reference KB for each, choose the correct entity.

Reference KB: 

Document:

“[[Obama]] {BarackObama, MichelleObama} majored in political science at [[Columbia]] {ColumbiaUnivserity, Columbia(country)} with a specialty in international relations...”

Honeypots check worker familiarity with topic covered by document

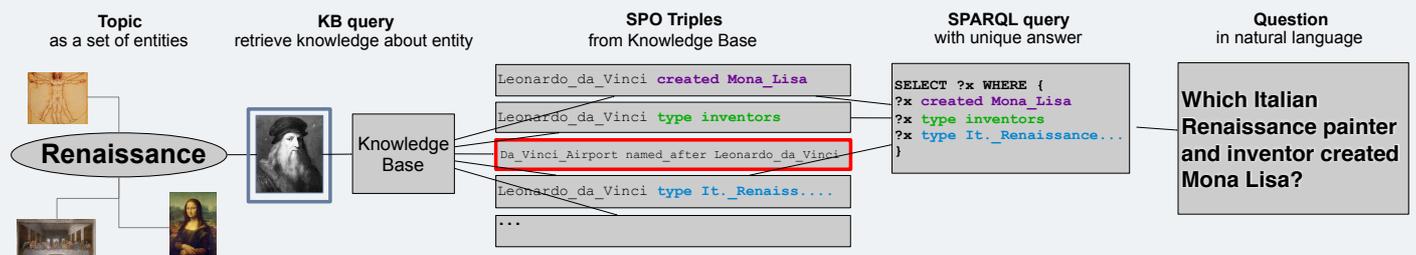
Question #1 (easy):

Which person is the vice president of Barack Obama?
(a) AlGore (b) JoeBiden (c) DickCheney

Question #2 (difficult):

Which award was given to Barack Obama?
(a) GrammyAward (b) AcademyAward (c) NationalBookAward

Question Construction



Question Difficulty

Popularity: fraction of links in Wikipedia which point to the target entity’s article.

$$Difficulty = \frac{1}{n} + \frac{1}{n} \sum_{i=1}^n s(s_i p_i o_i) + \frac{1}{n} \sum_{i=1}^n c(s_i p_i o_i)$$

Selectivity: reciprocal number of answer triples in the knowledge graph

Coherence: Jaccard coefficient of the sets of Wikipedia articles pointing to s and o

Distractor Generation

SPARQL query with unique answer

```
SELECT ?x WHERE {
  ?x created Mona_Lisa
  ?x type inventors
  ?x type It._Renaissance...
}
```

relaxed SPARQL query with multiple answers

```
SELECT ?x WHERE {
  ?x type It_Renaissance_Painters
}
```

