Uncommonsense

Enriching commonsense knowledge bases with informative negated statements boosts their usability

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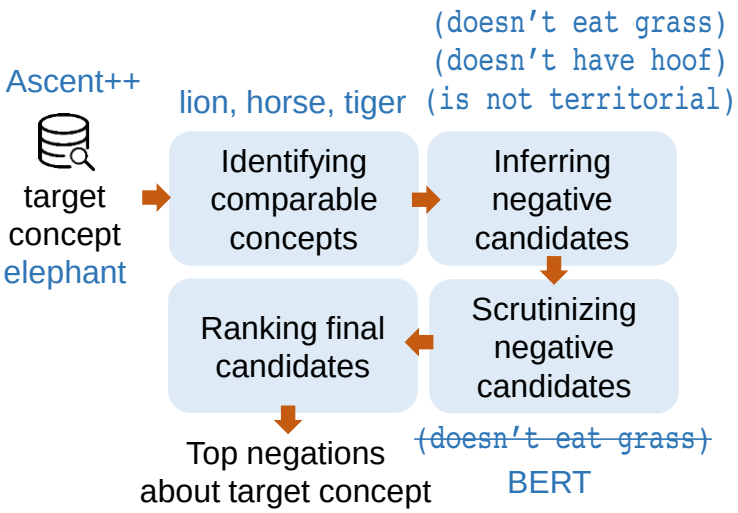
Motivation

- Commonsense Knowledge (CSK): semi-structured information about everyday concepts
- Commonsense Knowledge Bases (CSKBs): stores CSK in triple form
  `(elephant, found in the wild)`
- Existing CSKBs store positive triples and very little to no negative triples
  `(elephant, is not a carnivore)`
- Baseline: Closed-world Assumption (CWA), absent statements = negated statements
  Many wrong and uninformative negations

Methodology

Uncommonsense discovers informative negations about target concepts by exploiting positives about comparable concepts.



1. `(elephant is not territorial)`
2. `(elephant doesn't have hoof)`

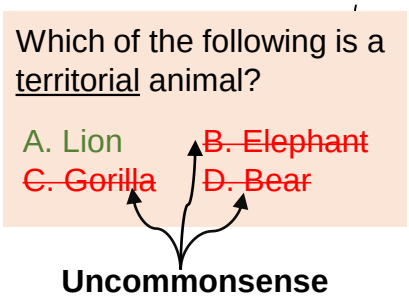
Intrinsic Evaluation

+18% in informativeness
+17% in recall

Method Top negation about elephant
CW-baseline `(elephant, can't practice law)`
Quasimodo^{neg} `(elephant, can't survive)`
GPT-3^{neg} `(elephant, doesn't have tail)`
NegatER `(elephant, isn't interested)`
Uncommonsense `(elephant, isn't carnivore)`

Use Cases

+9% in informativeness (negative trivia)
CSKB: Ascent++
+4% in accuracy (KB completion)
CSKB: ConceptNet
+18% in helpful eliminations (MCQA)
Benchmark: CommonsenseQA



Demo: uncommonsense.mpi-inf.mpg.de
Contact: hibaarnaout.com
Arnaout et al., Negative Statements Considered Useful, JWS'21
Arnaout et al., Enriching KBs with Interesting Negative Statements, AKBC'20

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