CONVINSE allows ConvQA systems to operate over heterogeneous sources

ONE INFORMATION SOURCE HARDLY FITS ALL INFORMATION NEEDS
★ Different questions (more conveniently) answerable via different information sources
★ Existing ConvQA systems operate over either only knowledge bases, only text, or only tables
★ Source-specific choices are taken for individual modules in the ConvQA system

GENERAL APPROACH: SEAMLESS INTEGRATION OF HETEROGENEOUS SOURCES
1. Question Understanding (QU):
   Derive an intent-explicit representation of an incoming question and its conversational context.
2. Evidence Retrieval and Scoring (ERS):
   Harness this intent-explicit representation to uniformly capture the most relevant evidences. Specifically, evidences from different sources are verbalized (brought to textual form), and then treated alike.
3. Heterogeneous Answering (HA):
   Answer the information need from these most relevant evidences.

STRUCTURED REPRESENTATION TO MATCH WITH HETEROGENEOUS SOURCES
★ Key idea: Capture information need in a structured way, based solely on the conversation so far
★ Structured representation (SR) similar to logical form for matching heterogeneous sources
★ Categorize information need into { context | entity | relation | answer type }
★ Individual fields filled with surface forms from ongoing conversation
★ Construct SRs for training via distant supervision from pure sequences of question-answer pairs

ConvMix requires information from heterogeneous sources for answering

ConvMix dataset for heterogeneous ConvQA
★ Natural, crowdsourced ConvQA benchmark
★ 3,000 Conversations with 16,000 questions
★ Meta-data like completed forms, paraphrases, entities
★ Wikidata KB, Wikipedia text, tables and infoboxes

Results on ConvMix

<table>
<thead>
<tr>
<th></th>
<th>CONVINSE</th>
<th>Question Rewriting</th>
<th>Question Resolution</th>
<th>Prepend all</th>
<th>Prepend init+prev</th>
<th>Prepend prev</th>
<th>Prepend init</th>
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Precision@1 on ConvMix, adapting QU methods to the task (ERS and HA kept static across baselines).

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