Building Knowledge Graphs of Experientially Related Concepts

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TL;DR: Obtain knowledge about the relationships between consumers' experiences from reviews

Motivation

Search engines struggle to answer queries like "*good hotel nearby*" due to a lack of knowledge about how consumer experiences are linked (experiential relatedness)

Contribution

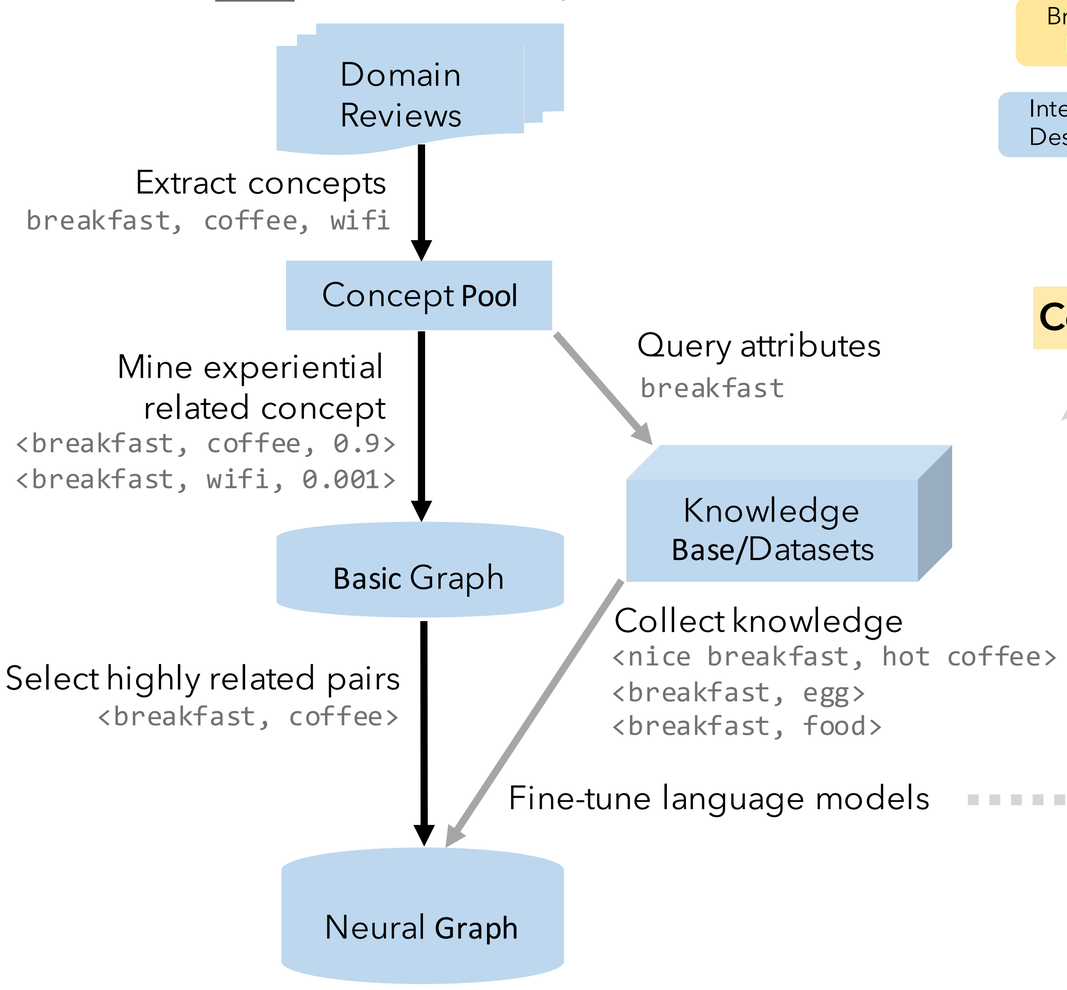
CoNex: 1) identify associated experiential factors from domain corpora, 2) train LMs to generate more experiential associations.

Unsupervised, generalizable way to obtain accurate and comprehensive knowledge.

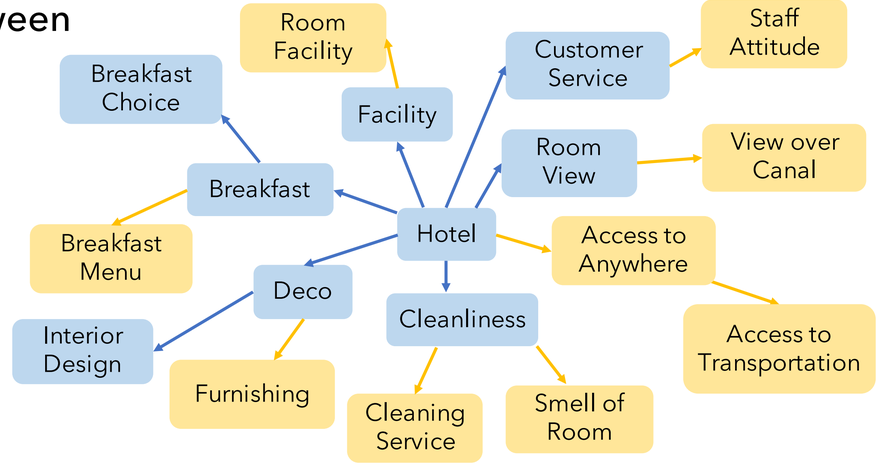
CoNex's Step 1

Use bag-of-words models to mine the associations between experiential concepts from domain corpora.

"delicious breakfast and fantastic coffee"
"Brilliant Wi-Fi. Clock with USB port in the room"



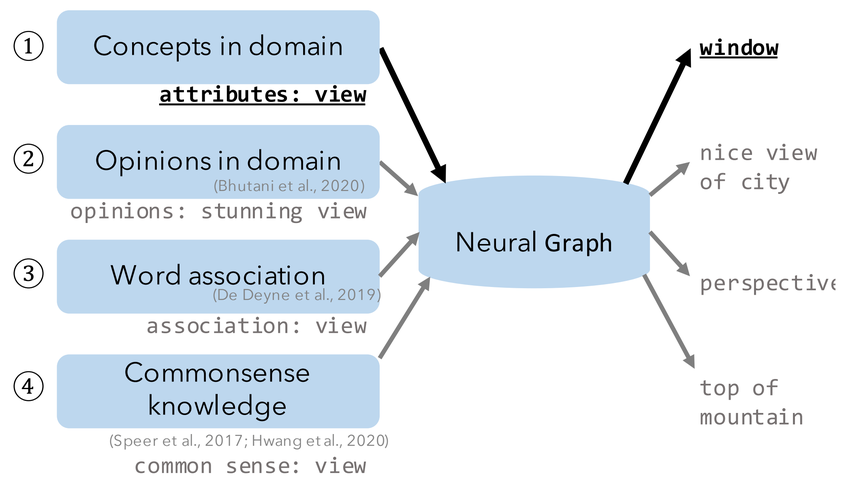
Example of CoNex's Outcome



This helps search services better answer "*good hotel nearby*" by, e.g., returning hotels with high *cleanliness* ratings and *service* ratings, which are relevant but more specific.

CoNex's Step 2

Combine both domain-specific and external knowledge to fine-tune generative LMs (BART) to obtain more experiential associations.



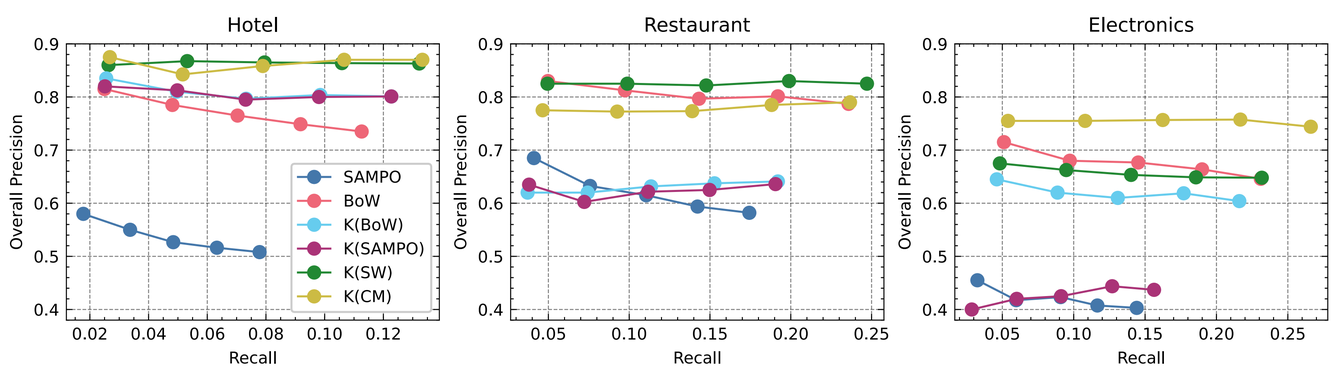
Full Paper

Github Link

Human Evaluation

MTurkers were asked to evaluate the quality of the experience knowledge obtained by one baseline and six components of CoNex (ablation study) from the hotel, restaurant, and electronics domains:

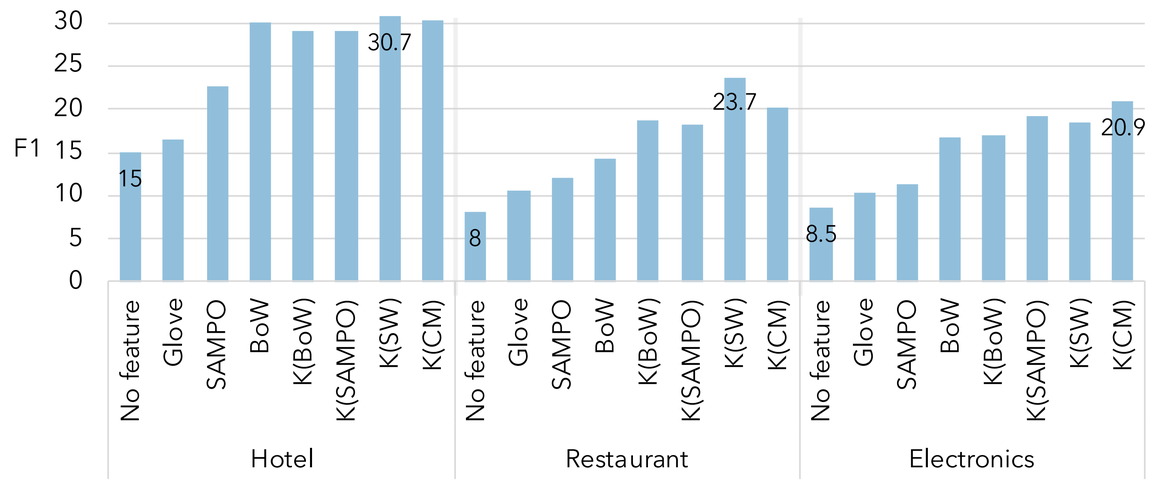
- SAMPO: (Bhutani et al., 2020)
- BoW: Step 1
- K(BoW): S1+①
- K(SAMPO): S1+②
- K(SW): S1+③
- K(CM): S1+④

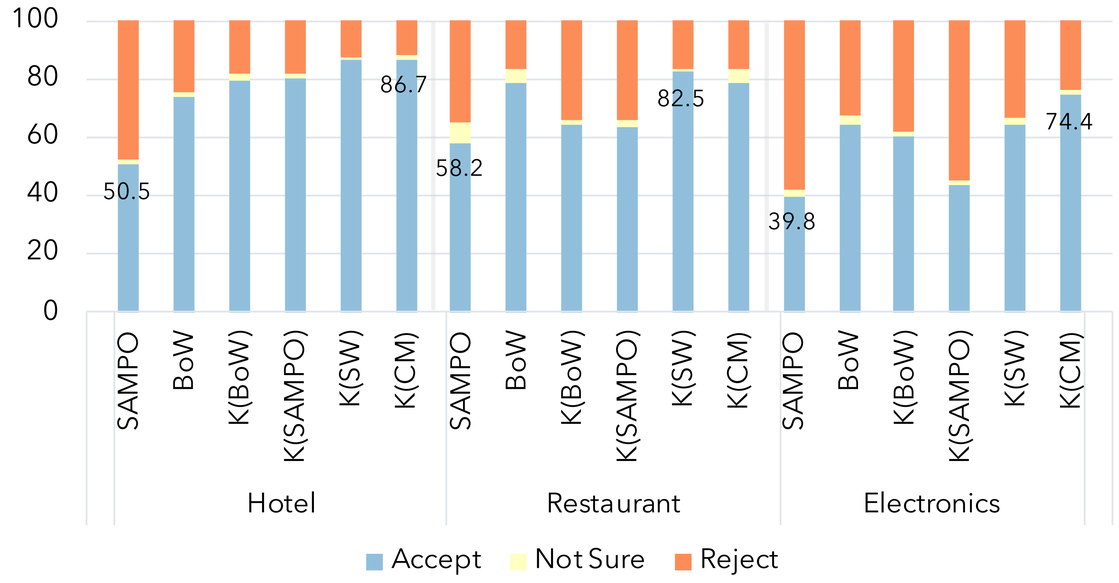


3. Neural KGs K(*) produced by Step 2 always have the best quality (precision & coverage).

Task-Based Evaluation

An experience-oriented answer retrieval task was simulated based on SubjQA (Bjerva et al., 2020).





1. CoNex can obtain accurate experiential associations across domains.
2. Common sense is more useful in less-subjective domains for boosting LMs, whereas word association is more useful in more-subjective domains.

- Experiential associations can help with this task, or maybe other experience-related IR tasks too.
- Integration with CoNex's experience KGs can improve classifier performance more than baseline KGs.