知识分析与处理

陈豪
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Improving Multi-hop Question Answering over Knowledge Graphs using Knowledge Base Embeddings

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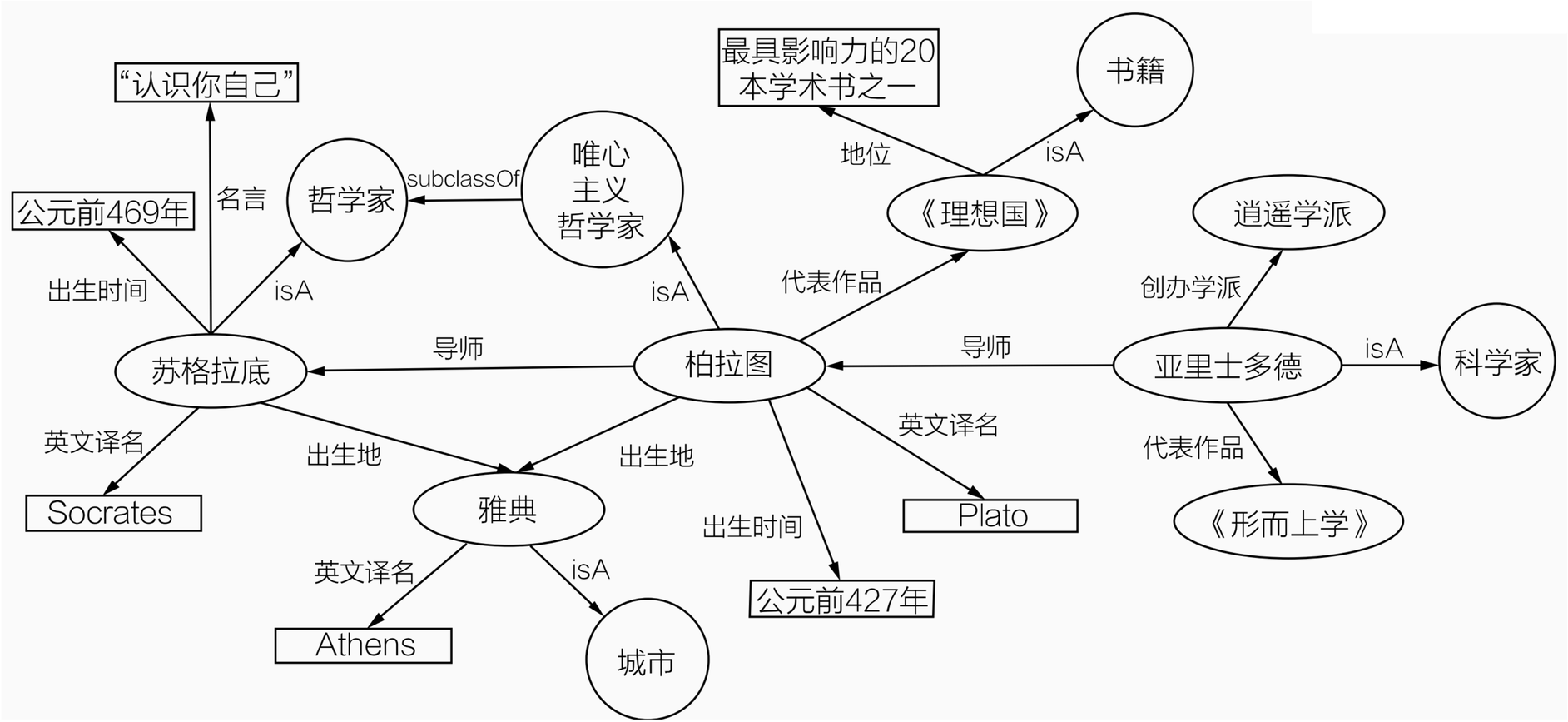
Outline

- Background
- Related Work
- Model
- Experiments
- Conclusion

Saxena A , Tripathi A , Talukdar P . Improving Multi-hop Question Answering over Knowledge Graphs using Knowledge Base Embeddings[C]// Proceedings of the 58th Annual Meeting of the Association for Computational Linguistics. 2020.

Background：KG



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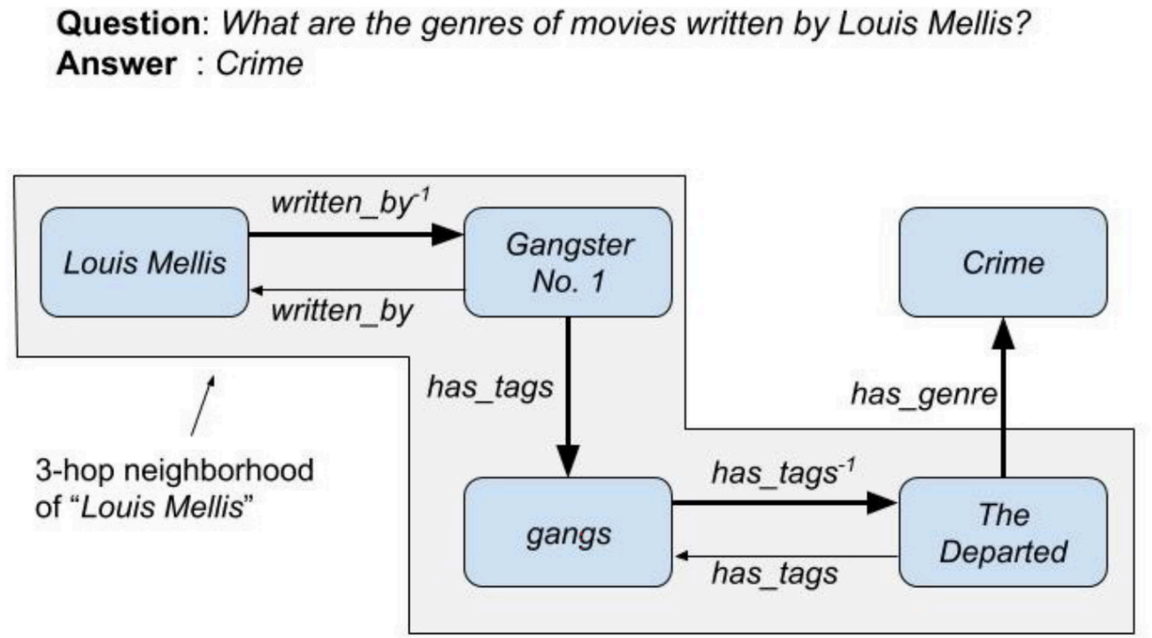
Background： KGQA



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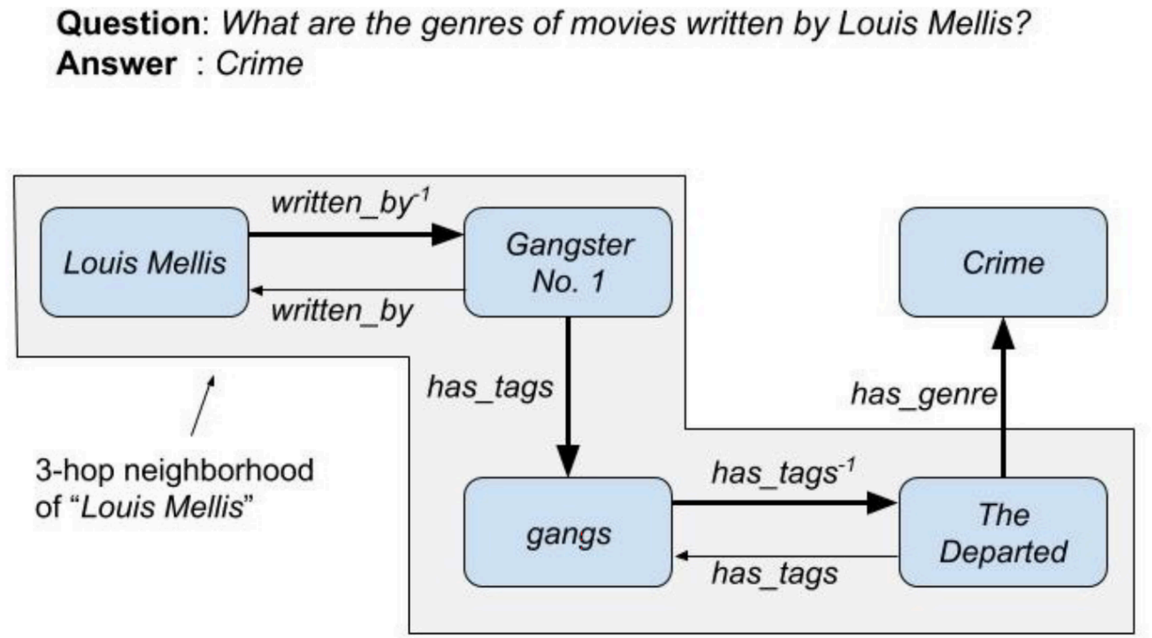

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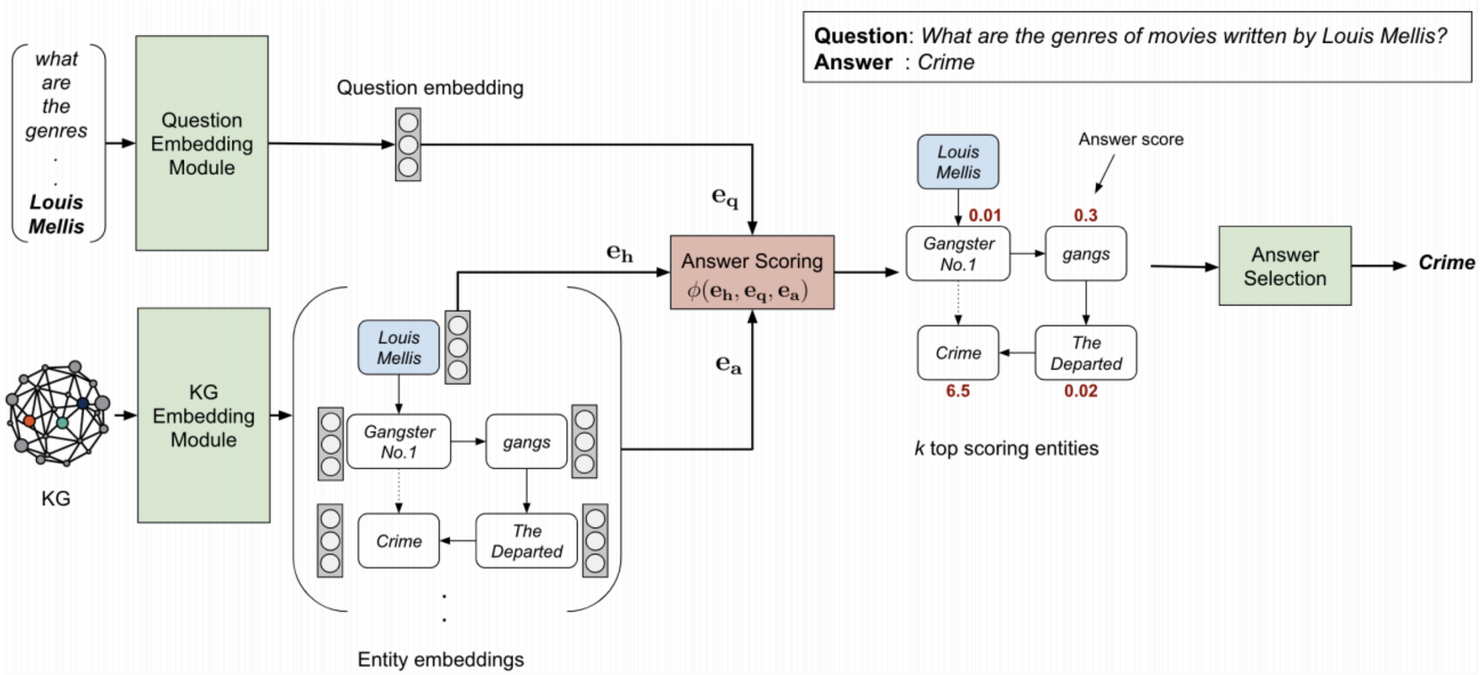
Related Work

- ✓ **TransE：Translating embeddings for modeling multi-relational data**
- ✓ **Memory Networks：...**
- ✓ **Neural Networks：...**

Model： EmbedKGQA



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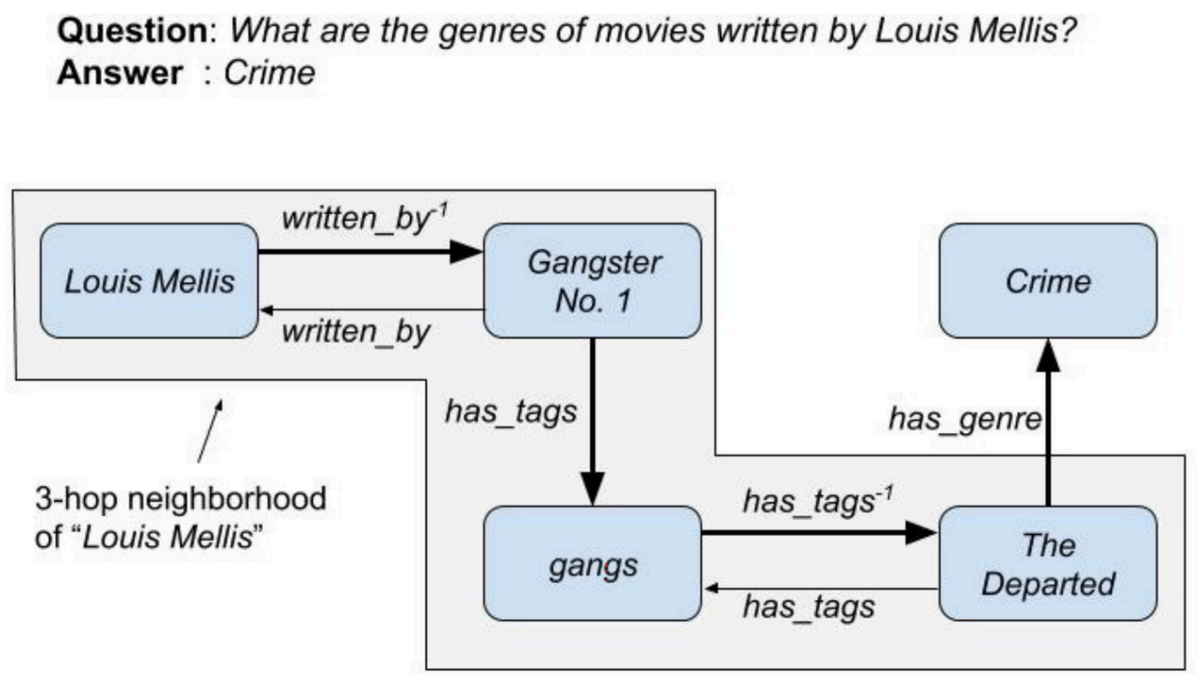
Link Prediction



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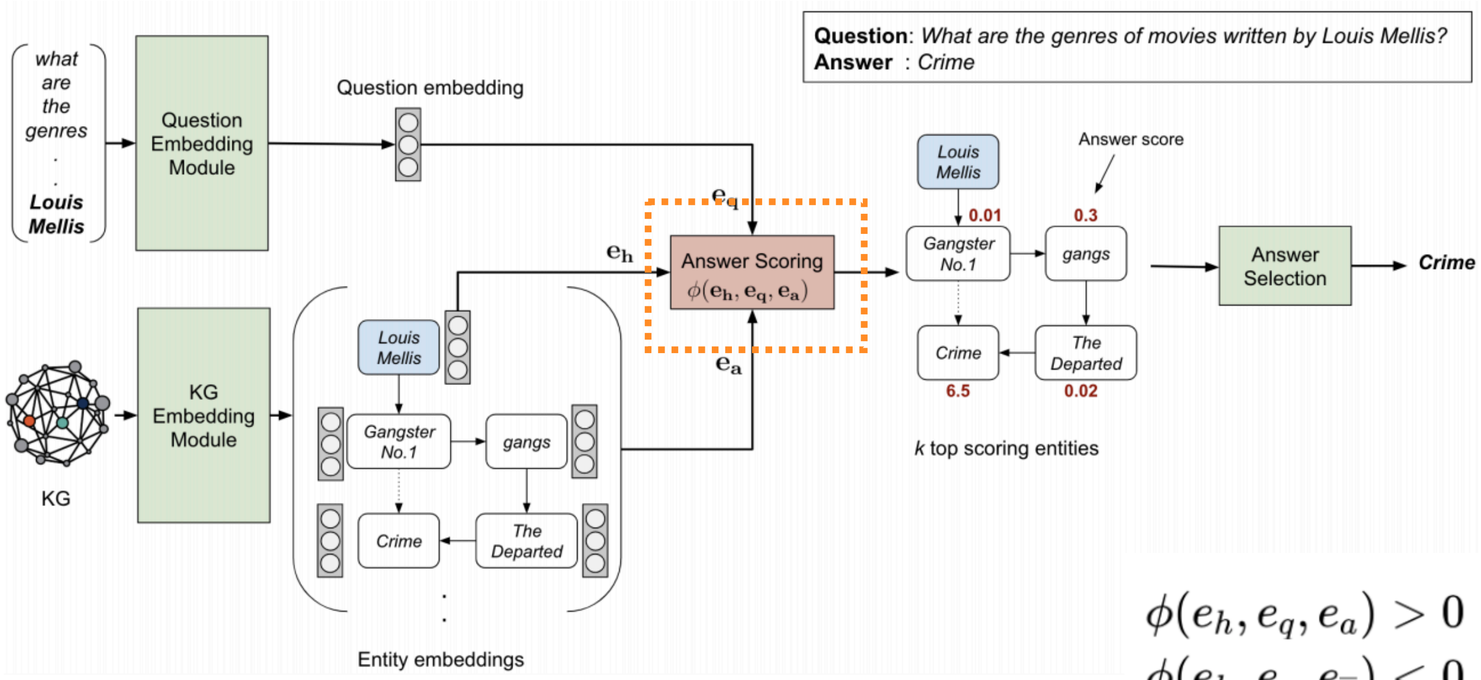
Model



$$\phi(e_h, e_q, e_a) > 0 \quad \forall a \in \mathcal{A}$$
$$\phi(e_h, e_q, e_{\bar{a}}) < 0 \quad \forall \bar{a} \notin \mathcal{A}$$

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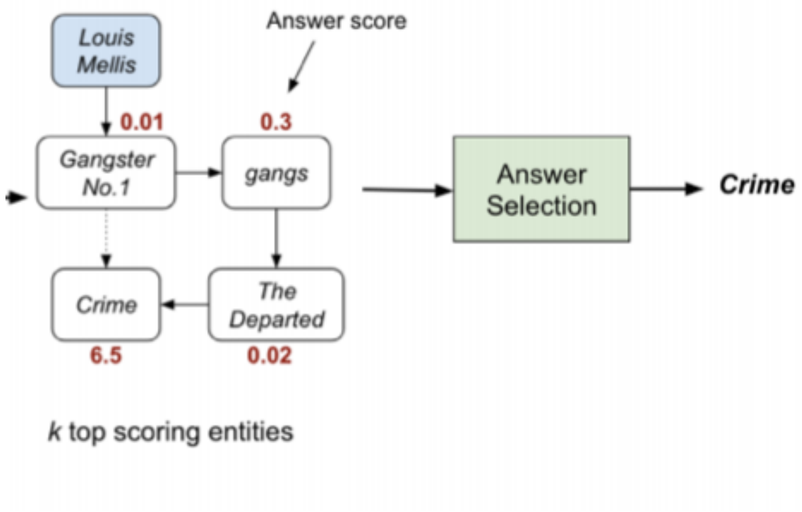
Model： Answer Selection



$$h_q = \text{RoBERTa}(q')$$

$$S(r, q) = \text{sigmoid}(h_q^T h_r)$$

$$\text{RelScore}_{a'} = |\mathcal{R}_a \cap \mathcal{R}_{a'}|$$

$$e_{ans} = \underset{a' \in \mathcal{N}_h}{\text{argmax}}\ \phi(e_h, e_q, e_{a'}) + \gamma * \text{RelScore}_{a'}$$

Experiments

Model	WebQSP KG-Full	WebQSP KG-50
KV-Mem	46.7	32.7 (31.6)
GraftNet	66.4	48.2 (49.7)
PullNet	**68.1**	50.1 (51.9)
EmbedKGQA	66.6	**53.2**

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Conclusion

- EmbedKGQA 构建方法简单且有效，充分利用了现有嵌入方法在应对知识图谱稀疏性与实现链接预测方面的良好表现，实现了多跳 QA。

- 候选答案实体选择的方法细节并未在文中被阐述清楚，在大型知识图谱上的多跳 QA 效果可能值得深究。

THANKS

——2020.11.05