Extracting Relational Facts by an End-to-End Neural Model with Copy Mechanism

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Motivation

- Relational triplets may have overlaps in a sentence.
- We divide the sentences into three types according to triplet overlap degree: Normal, EntityPairOverlap (EPO) and SingleEntityOverlap (SEO).
- Current work mainly concentrate on relation extraction of Normal class.

Methods

- We aim to design a model that could extract triplets from sentences of Normal, EPO and SEO classes.
- We propose an end2end model based on Seq2Seq learning with copy mechanism.
  - The encoder converts a natural language sentence (the source sentence) into a fixed length semantic vector.
  - Then, the decoder reads in this vector and generates triplets directly.
  - To generate a triplet, firstly, the decoder generates the relation.
  - Secondly, by adopting the copy mechanism, the decoder copies the first entity (head entity) from the source sentence.
  - Lastly, the decoder copies the second entity (tail entity) from the source sentence.
- We adopt two different strategies in decoding process:
  - Employing only one unifies decoder (OneDecoder) to generate all triplets
  - Or, applying multiple separated decoders (MultiDecoder) and each of them generating one triplet.

Experiments

- Datasets: NYT and WebNLG
- Baseline: NovelTagging (ACL2017)
- Results of different models

Contribution

- We propose an end2end neural model based on sequence-to-sequence learning with copy mechanism to extract relational facts from sentences, where the entities and relations could be jointly extracted.
- Our model could consider the relational triplet overlap problem through copy mechanism. In our knowledge, the relational triplet overlap problem has never been addressed before.
- We conduct experiments on two public datasets. Experimental results show that our model outperforms the state-of-the-arts with 39.8% and 31.1% improvements respectively.