Natural Language Processing Overview

Filip Boltuzic

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1 Encoding characters for neural networks

[Zhang and LeCun, 2015] employ a ConvNet for text and use an alphabet of characters of size m ($m = 70$), after which they one-hot encode chars. Chars not in the alphabet are zero-encoded. Characters are quantized in backward order.

2 Question answering

[Xiong et al., 2016] create a Dynamic Coattention Network where they encode the question and answer using LSTMs, apply a coattention between the results,

3 Natural Language Inference

Natural Language Inference is a methodology for solving *Textual entailment*. [Chen et al., 2017] says the typical model contains of four steps:

1. encoding input sentences,

2. performing co-attention across premise and hypothesis

3. collecting and computing local inference

4. performing sentence level inference judgement by composing local inference

They do the same, but add WordNet as a knowledge resource to mark if something is in a relation (synonym, hyponym...) with another word (text-hypothesis pairs are checked). Knowledge is applied in multiple stages (last three)

References

[Chen et al., 2017] Chen, Q., Zhu, X., Ling, Z.-H., Inkpen, D., and Wei, S. (2017). Natural Language Inference with External Knowledge.

[Xiong et al., 2016] Xiong, C., Zhong, V., and Socher, R. (2016). Dynamic Coattention Networks For Question Answering.

[Zhang and LeCun, 2015] Zhang, X. and LeCun, Y. (2015). Text Understanding from Scratch.