Questions NLP Project

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Objective

- We aim to show which type of influence a change in the question has on the output of a question answering model.
- We will generate adversarial examples and simulate speed-reading the question by changing the input.

Adversarial examples

- Adversarial examples are sentences that have one or more grammatical classes changed for a synonym.

- We will change verbs, nouns, and adjectives to contrast these results.

Original Text Prediction: **Entailment** (Confidence = 86%)
Premise: *A runner wearing purple strives for the finish line.* **Hypothesis:** *A runner wants to head for the finish line.*
Adversarial Text Prediction: **Contradiction** (Confidence = 43%)
Premise: *A runner wearing purple strives for the finish line.* **Hypothesis:** *A racer wants to head for the finish line.*

Table 2: Example of attack results for the textual entailment task. Modified words are highlighted in green and red for the original and adversarial texts, respectively.

Speed reading

Query: XXXXX would have protested but she knew it would be in vain.

1. **"I must go !"**
2. the girl cried feverishly.
3. She was afraid Mrs. Cameron would try to prevent her going, and all at once she knew that she could not bear that.
4. "Must go?
5. Where?
6. Dinner is almost ready, and —" "Oh , I do n't want any dinner.
7. **I 'm going home -- I will sail over."**
8. "My dear child, don't be foolish
9. It 's too late to go over the harbour tonight.
10. They won't be expecting you.
11. **Wait until the morning ."**
12. "No -- oh, you do n't understand.
13. I must go -- I must!
14. My mother is over there."
15. **Something in the girl's last sentence or the tone in which it was uttered brought a look of pain to Mrs. Cameron 's face.**
16. But she made no further attempt to dissuade her.
17. "Well, if you must.
18. **But you can not go alone -- no, Nora, I can not allow it.**
19. The wind is too high and it is too late for you to go over by yourself.
20. Clark Bryant will take you."

Candidates: Bryant | Cameron | Dinner | Mrs. | Nora | Something | harbour| morning | sentence | tonight

Answer: Nora

- The model is able to decide how much to read from the input.
- We will simulate the speed-reading by skipping a set amount of words in the questions.

Architecture

- We use a GRU like in the paper Question Answering using Deep Learning implement for the bAbI dataset in Keras.
- We will train for every changed data set.

Data set

- We will use SQuaD data set.
- It offers its own evaluation-script so that we are able to compare our results in a leaderboard.

References

- http://aclweb.org/anthology/D18-1316 // Generating Natural Language Adversarial Examples
- https://tsujuifu.github.io/pubs/emnlp18_lstm-shuttle.pdf // Speed Reading: Learning to Read ForBackward via Shuttle
- https://cs224d.stanford.edu/reports/StrohMathur.pdf // Question Answering using Deep Learning
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