Extended QANet and application on SQuAD 2.0

INTRODUCTION

The topic of this project is extending the recent proposed QANet [1] and apply these methods on SQuAD 2.0 [2]. In this project, we propose a framework that combines the strength of transformer and RNN to conduct fast machine comprehension with consideration to sequential logic in the context.

DATASET AND METHOD

We apply the proposed method on SQuAD 2.0 [2]. Based on the QANet architecture, we made following modifications:

• add a RNN based contextual embedding layer in addition to the word-level and character-level embeddings.
• simplify the encoder blocks for both encoding and modeling layers with less stacks of ConvNet.
• replace the 1D ConvNet with GRU in the encoder block.

RESULTS

The table shows the EM and F1 results for all of the methods we applied in this project.

- Standard QANet 1 head performs best
- Applying ensemble model based on all of the methods achieve the highest F1 score and EM score.

CONCLUSIONS

- Our implementation of QANet achieved near SoTA accuracy on SQuAD 2.0 dataset
- Ablation study conducted to analyze the functionality of important layers
- Insights drawn from visualization of Q2C and C2Q attentions
- Accuracy study conducted over question types and length of answer

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REFERENCES