

# The Concordia NLG Surface Realizer at SR'19

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## Objective

This study was conducted to build a model to participate in the shallow track of SR'19 [1]. The model reconstructs a sentence from unordered words where the word inflections also were removed.

## Dataset

- The training and development sets of SR'19 were taken from Universal Dependency (UD) datasets [2].
- We worked on four English datasets containing 19,976 sentences (Table 1)

## Methodology

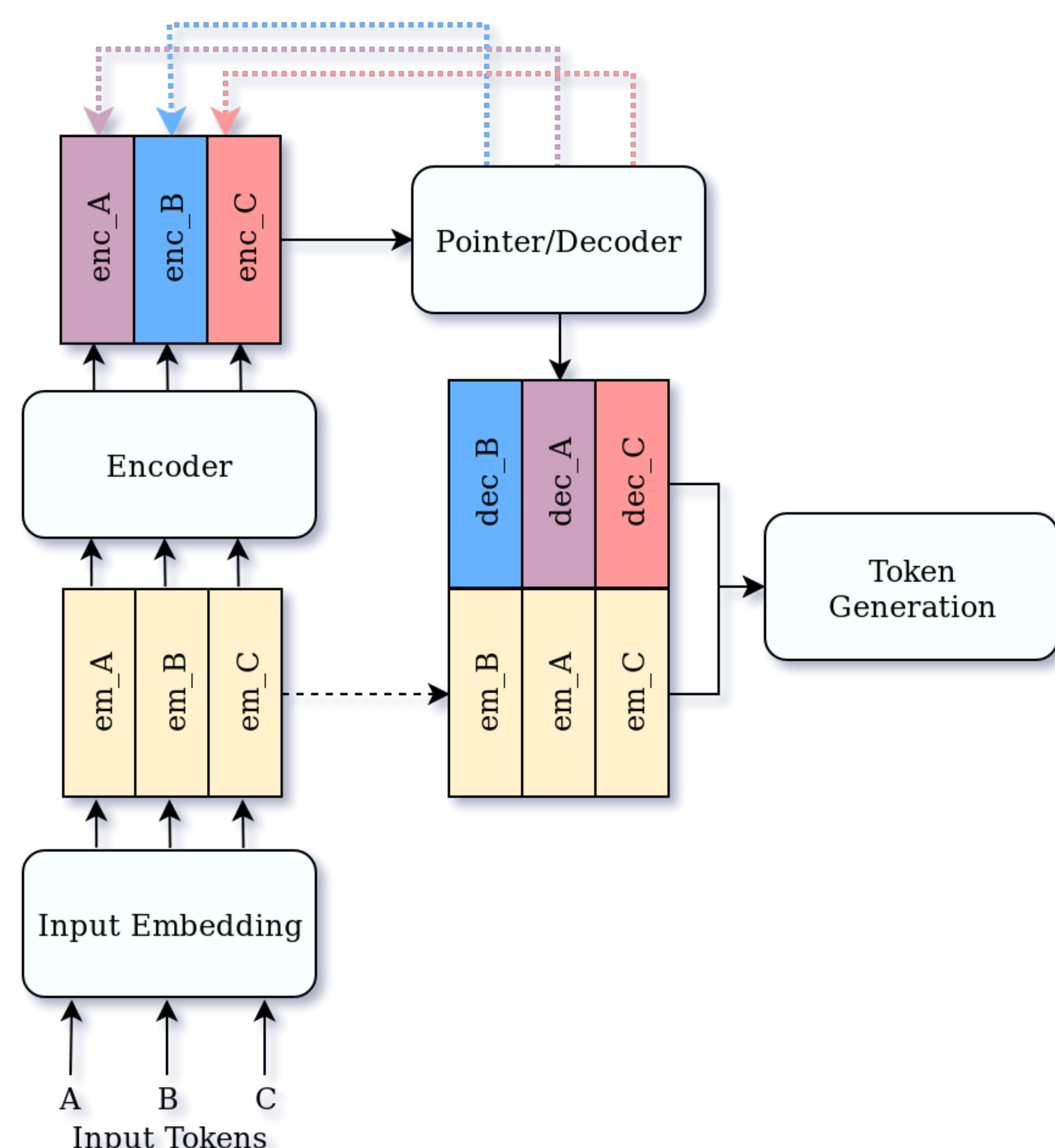


Figure 1: The model architecture used for the shallow track at SR'19. The proposed Model (Figure 1) consists of five main sub-modules.

- **Input Embedding:** embeds each token  $X$  alongside its feature to embedded token ( $em_X$ )
- **Encoder:** encodes each embedded token ( $enc_X$ )<sup>1</sup>
- **Decoder:** generates the query for Pointer ( $dec_X$ ) given previously selected tokens and encoded tokens from Encoder<sup>1</sup>
- **Pointer:** is an attention mechanism where attends over encoded tokens and uses  $dec_X$  as its query [4]
- **Token Generation:** generates the inflected form of tokens using the concatenation of embedded token ( $em_X$ ) and decoded token ( $dec_X$ )

## Results and Analysis

Both Automatic and Human evaluation show that our system could not achieve a good result among other participants.

#		Dataset	BLEU
1	In-domain	en_ewt-ud-test	22.08
2		en_gum-ud-test	15.32
3		en_lines-ud-test	15.30
4		en_partut-ud-test	10.07
5	Out-of-domain	en_pud-ud-test	12.36
6	Predicted	en_ewt-Pred-HIT-edit	21.21
7		en_pud-Pred-LATTICE	12.89

Table 1: BLEU Score of our submission in SR'19

<sup>1</sup> We employed transformer encoder and decoder [3]

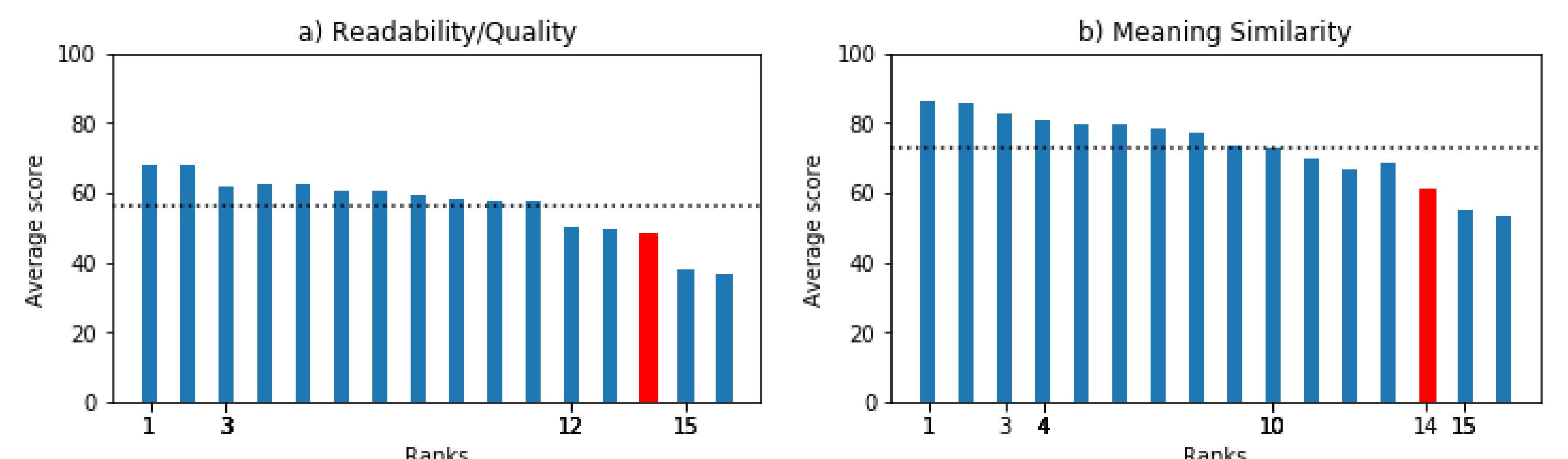


Figure 2: Human evaluation results compared to all participants at SR'19

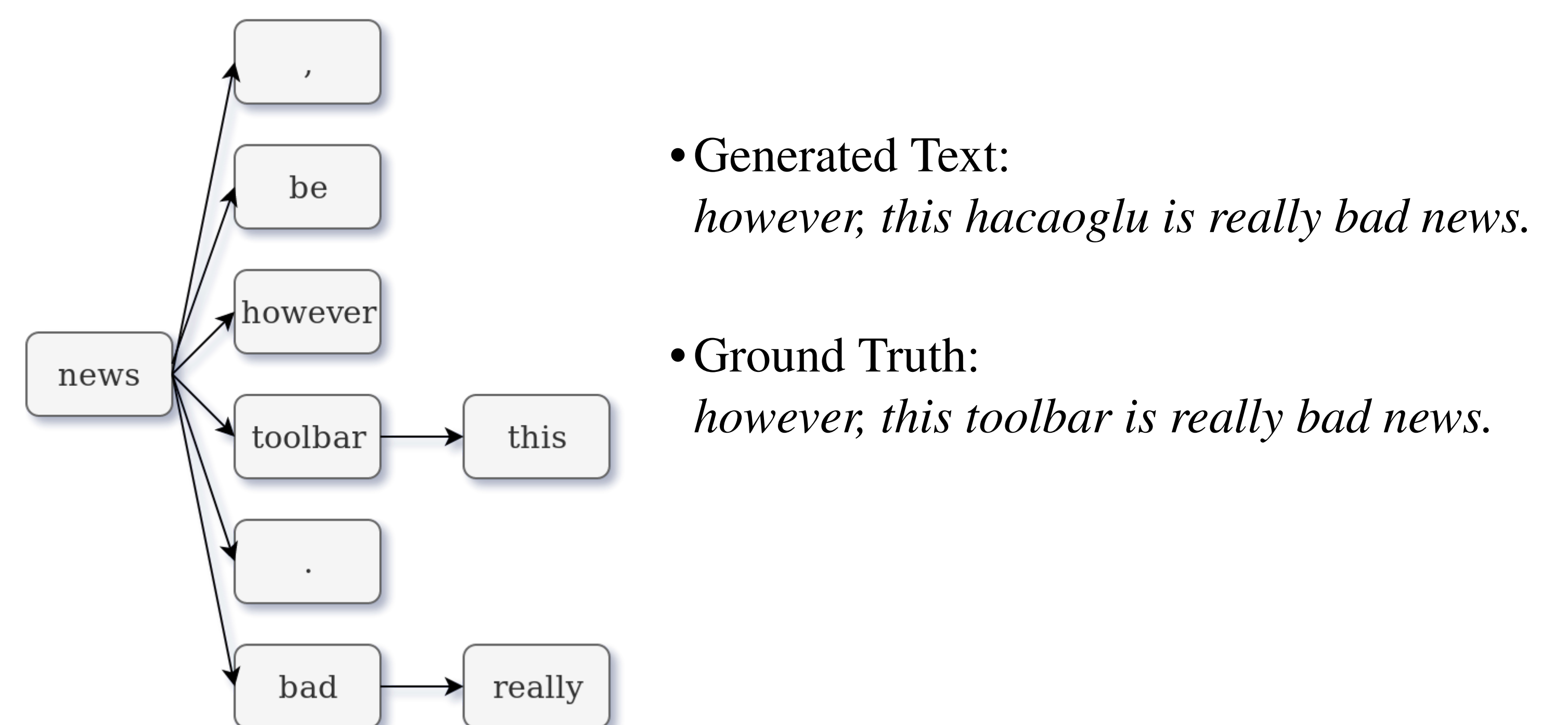


Figure 3: An example of a generated text

An analysis of a few generated outputs of the proposed system showed that the weak result could be mainly due to the poor performance of the Token generation module. An example is provided in Figure 3.

## Conclusion

The proposed system is composed of a pointer network where its encoder and decoder modules borrowed from transformer, aim to reconstruct the tokens' order and inflection. Our model achieved the average scores of 48.1 and 60.9 for the Readability/Quality and Meaning Similarity on the English datasets. For the future work, it would be interesting to investigate the model sensitivity to the training size, utilize other features provided by the universal dependency structure, and the possibility of using pretrained language models.

## Contact

For further information please visit:  
<https://github.com/farhoodf/SR19>



## References

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