AUTOMATIC TEXT SUMMARIZATION

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Predicting

- Text summarization is the process of generating a concise and logical version of a larger original document.
- In our problem, we followed the single-document generic abstractive approach.
- Our model is seq2seq model; an encoder-decoder network with attention.
- For the evaluation, we use the ROUGE metric.

Data

- Preprocessed Gigaword dataset:
  - lowercase conversion
  - number replacement
- A total of 3,803,957 training samples and 189,651 test samples.
- Data samples are articles, supplemented with single-sentence ground truth summaries.

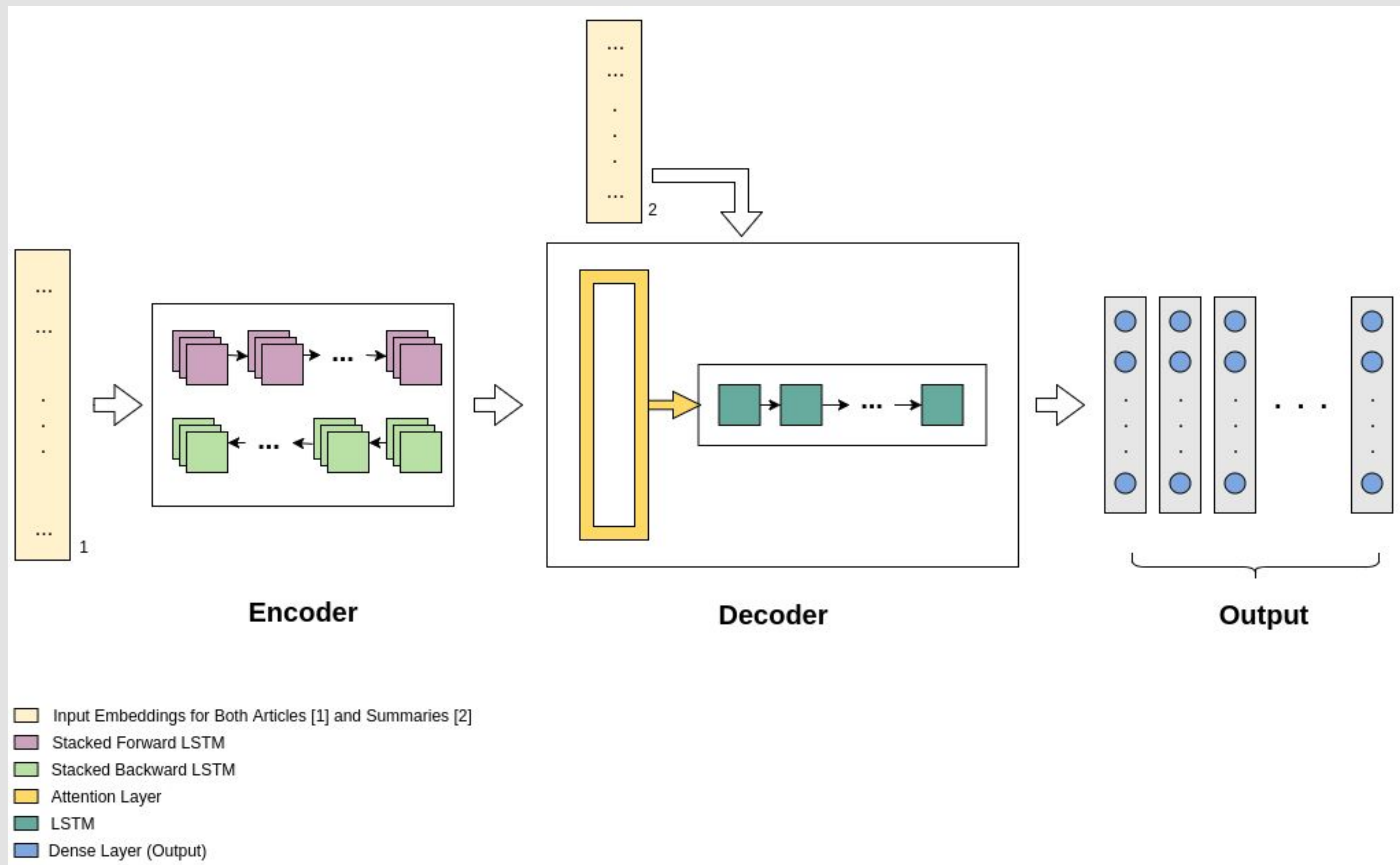
Features

- d-feature vector of each input word, where (d) is a user-configured dimension.
- Either pretrained GloVe embeddings, or self-learned by the model network.

Model

Encoder-Decoder network; where:

- Encoder: stacked bidirectional LSTM with dropout
- Decoder: LSTM network with attention



Hyperparameters and Evaluation

stacked LSTM layers	LSTM hidden units	embedding type	embedding size	batch size	learning rate	dropout keep prob.	ROUGE-1	ROUGE-2	ROUGE-L
2	150	GloVe	300	512	0.01	0.8	31	12.53	27.27
2	100	self-learned	200	64	0.01	0.8	19.77	6.02	16.7
4	150	GloVe	300	512	0.01	0.8	19.37	5.55	17.02

Discussion

- Better results are achieved when using pretrained embeddings, unlike self-learned embeddings that performed very poorly.
- As stacked LSTM gets deeper, the model output becomes less acceptable

Future Work

- Apply "Beam Search" technique for better sequence generation.
- Support "Pointer-Generator" method to tackle factual errors, OOV (out-of-vocab) words and repeating.
- Generalize decoder network to work on CNN and other datasets with multi-sentence summaries.

References

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[3] A. See, P. J. Liu, and C. D. Manning, "Get to the point: Summarization with pointer-generator networks," arXiv preprint arXiv:1704.04368, 2017.