

Unsupervised Abstractive Text Summarization

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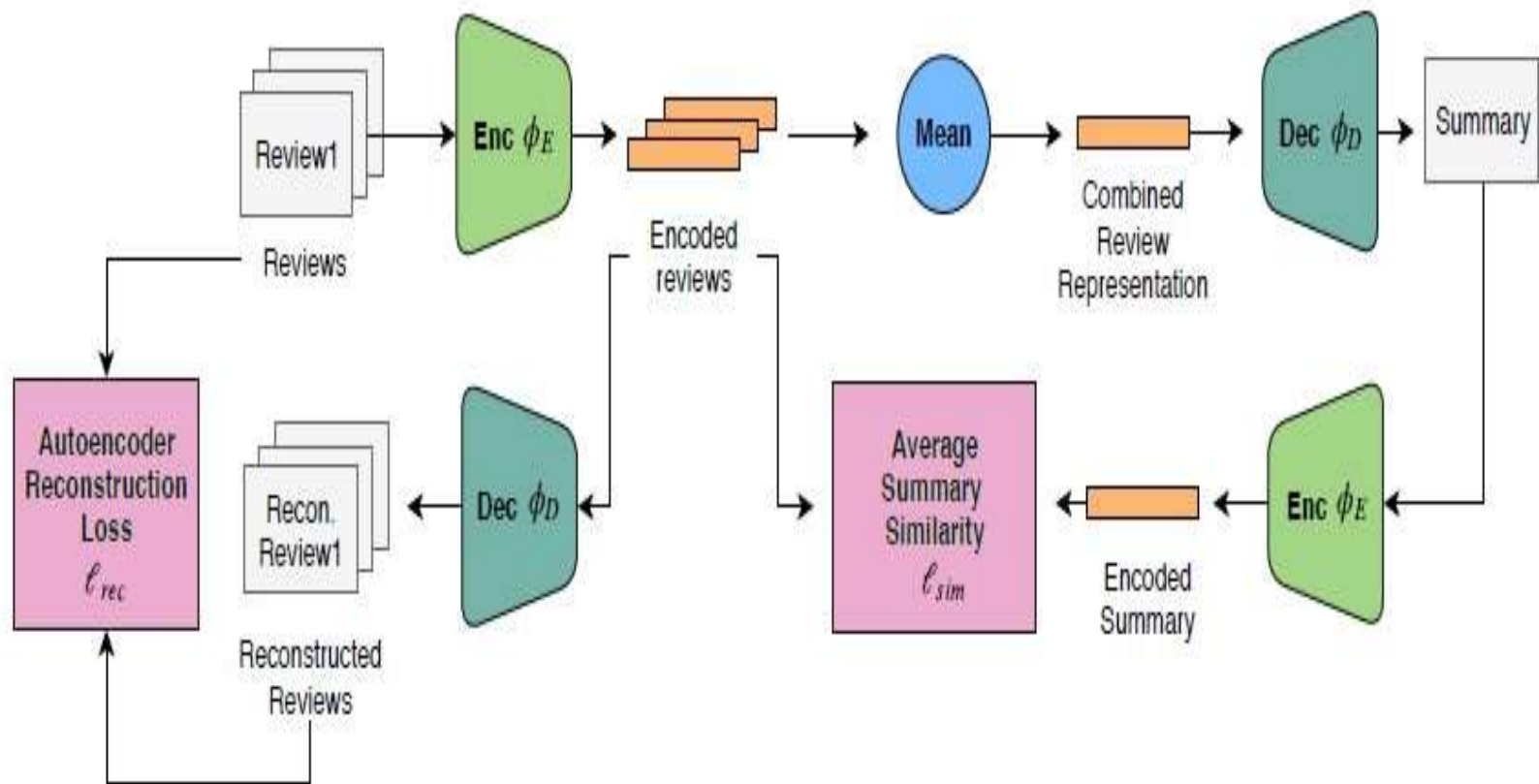
What is Data Summarization

- It is process of abbreviating a piece of data to smaller data
- Two approaches :-
 - Extractive
 - Abstractive
- Generally, in text summarization, we have many documents to summarize but have few or no examples of summary.

Unsupervised Approach (MeanSum)

- Auto-encoder module
 - LSTM encoder
 - LSTM decoder
 - It gives reconstruction loss.
- Summarization module
 - LSTM encoder
 - LSTM decoder
 - It gives similarity loss
- Total loss = reconstruction loss + similarity loss

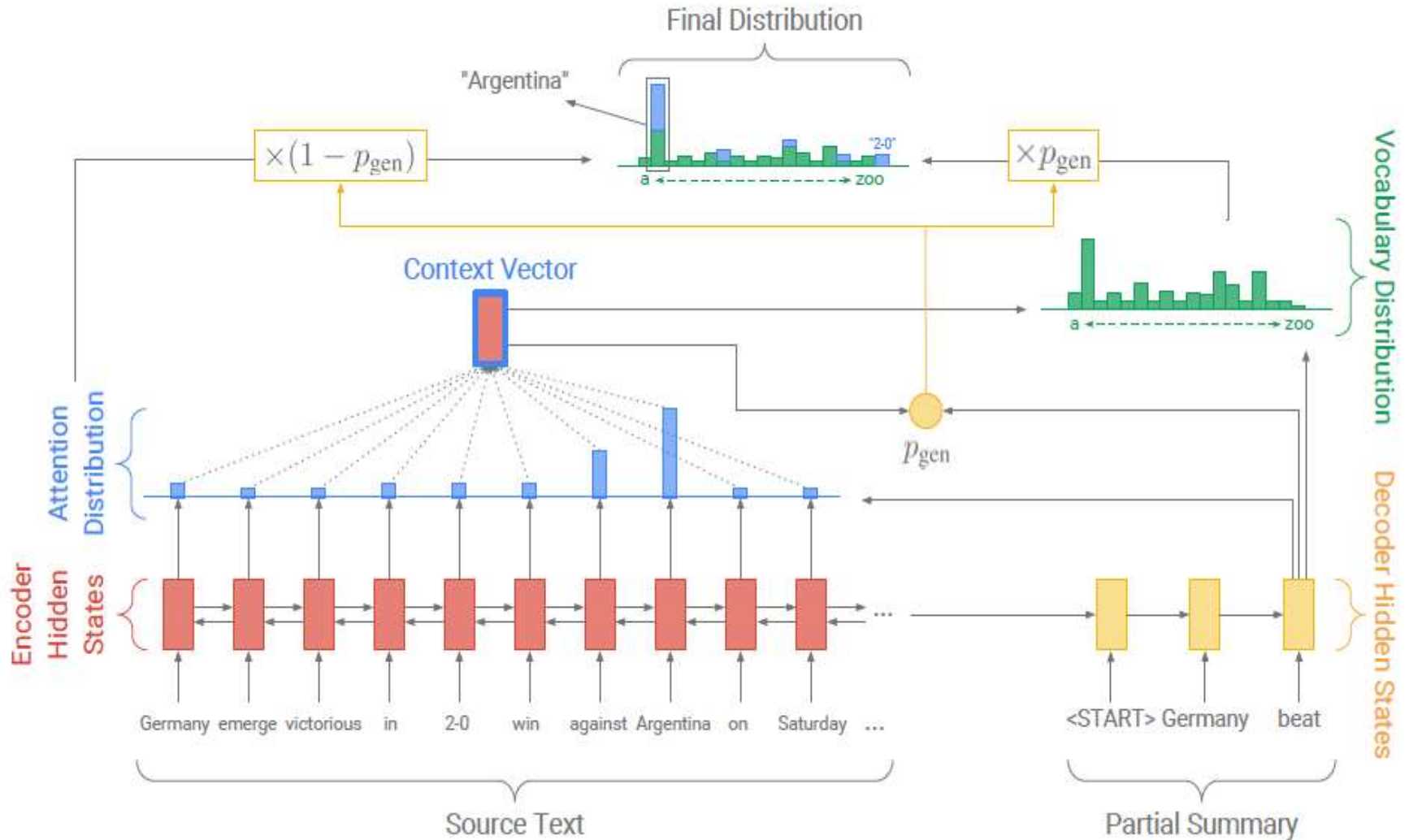
Neural Unsupervised Multi-Document Abstractive Summarization



Pointer Generator Networks

- MeanSum
 - It can not handle OOV words properly.
 - Might miss most relevant points.
- It enhances the traditional attention based sequence-to-sequence model.
- It uses PGN to copy words from the source text
- It calculates $P(\text{gen})$ that is $P(\text{generating words from vocabulary Vs. copying words from source text})$

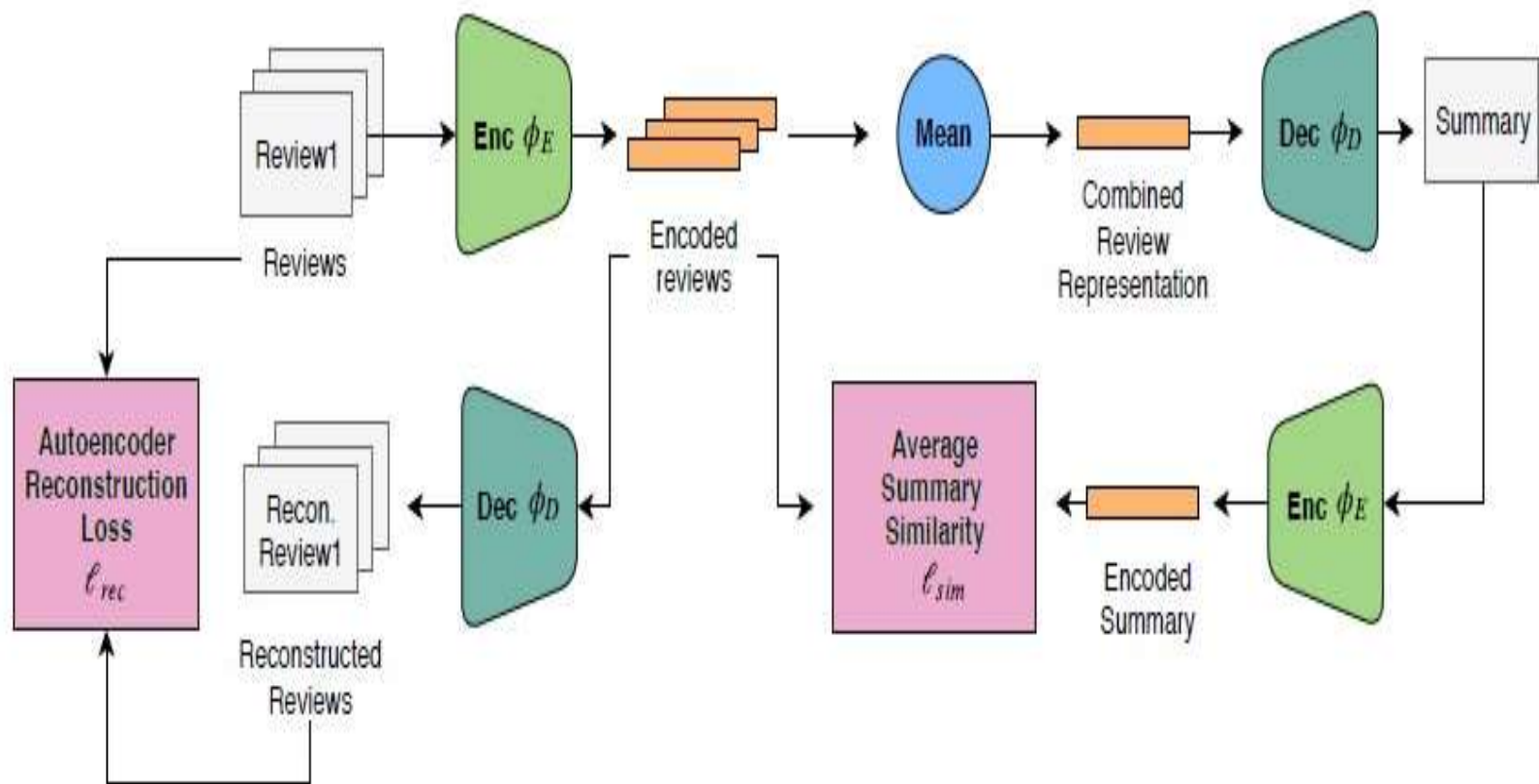
Pointer Generator Network



Contributions (MeanSum with PGN)

- We enhanced the MeanSum model with PGN
- Bottleneck of MeanSum model is capturing the meaning of the encoded reviews into a combined representation(mean)
- In the decoder of the summarization module, we used pointer network over the encoded reviews

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Results

- Successfully reproduced results from MeanSum and PGN
- We suspect slight decrease in performance is due to insufficient training
- We plan to train model at satisfactory level and update the values

Model	Vs. Reference Summaries			Metrics Without Summaries
	ROUGE-1	ROUGE-2	ROUGE-L	Sentiment Acc.
Meansum(<i>Pretrained</i>)	26.40	3.38	15.18	51.55
Meansum(<i>No Attention</i>)	25.96	3.43	15.52	48.71
Meansum(<i>Attention+Pointers</i>)	24.12	3.60	15.48	36.49

Future Work

- We can explore alternative ways of applying PGN to MeanSum
 - e.g. Instead of encoded review we can use raw reviews.
- All our experiments have been stopped early in the interest of time. We plan to fully train them and evaluate.

References

- (MeanSum) Eric Chu and Peter J. Liu. Unsupervised neural multi-document abstractive summarization. CoRR, abs/1810.05739, 2018.
- (PGN) Abigail See, Peter J. Liu, and Christopher D. Manning. Get to the point: Summarization with pointer-generator networks. Pages 1073-1083, 2017.

Thank You