News Topics Generation

DS 595 Natural Language Processing

Aukkawut Ammartayakun

November 18, 2021

Worcester Polytechnic Institute

Outline

1. References
2. Introduction
3. Methodology

References

Reference i

- Lin, C.-Y. (2004).
  ROUGE: A package for automatic evaluation of summaries.
  In Text Summarization Branches Out, pages 74–81, Barcelona, Spain. Association for Computational Linguistics.
- Nallapati, R., Zhou, B., dos Santos, C., Gulçehre, Ç., and Xiang, B. (2016).
  Abstractive text summarization using sequence-to-sequence RNNs and beyond.
  In Proceedings of The 20th SIGNLL Conference on Computational Natural Language Learning, pages 280–290, Berlin, Germany. Association for Computational Linguistics.

Reference ii

- Papineni, K., Roukos, S., Ward, T., and Zhu, W.-J. (2002).
  Bleu: A method for automatic evaluation of machine translation.
  In Proceedings of the 40th Annual Meeting on Association for Computational Linguistics, ACL '02, page 311–318, USA. Association for Computational Linguistics.
- Raffel, C., Shazeer, N., Roberts, A., Lee, K., Narang, S., Matena, M., Zhou, Y., Li, W., and Liu, P. J. (2020).
  Exploring the limits of transfer learning with a unified text-to-text transformer.
  Journal of Machine Learning Research, 21(140):1–67.

Reference iii

- See, A., Liu, P. J., and Manning, C. D. (2017).
  Get to the point: Summarization with pointer-generator networks.
- Sutskever, I., Vinyals, O., and Le, Q. V. (2014).
  Sequence to sequence learning with neural networks.
  In Ghahramani, Z., Welling, M., Cortes, C., Lawrence, N., and Weinberger, K. Q., editors, Advances in Neural Information Processing Systems, volume 27. Curran Associates, Inc.

Introduction

Problem Statement

Given the document D, we want to generate string h_D such that it summarizes the content in D with accurate information and concise.

Problem Statement

Given the document D, we want to generate string h_D such that it summarizes the content in D with accurate information and concise.

Example

D: A handful of other journalists and I had camped outside Basra for days, hanging back out of range of the mortars that puffed in the dry, empty land. We spent our time interviewing the refugees that trickled out of the town or the British soldiers waiting to move in.

h_D: Basra, 2003: Looting and Mystery

Methodology

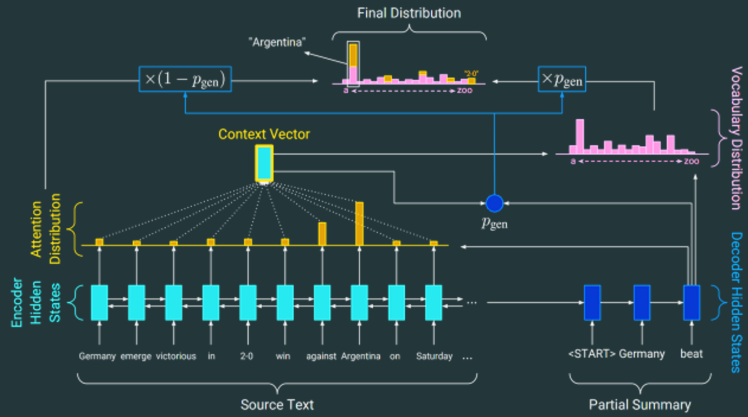
Literature Review

- As suggested by [Sutskever et al., 2014], RNN model can yield us the promising result but it also yield "artifacts" to the result.

Literature Review

- As suggested by [Sutskever et al., 2014], RNN model can yield us the promising result but it also yield "artifacts" to the result.
- Bidirectional RNN [Nallapati et al., 2016] shows the better performance.

Architecture



Use bidirectional LSTM along with attention to encode and generate context vector [See et al., 2017].

Architecture

- What if we combined the method proposed by [See et al., 2017] or [Raffel et al., 2020] with generative model?

Architecture

- What if we combined the method proposed by [See et al., 2017] or [Raffel et al., 2020] with generative model?
- That is, what if we treat [See et al., 2017] or [Raffel et al., 2020] model as the generator and we then create discriminator on top of that?

Dataset

- NYT news dataset

Dataset

- NYT news dataset
- >100K entries of title, topic, abstract, keywords

Evaluation

- Metric of evaluation: BLEU[Papineni et al., 2002] and ROUGE-l[Lin, 2004]

Work done

- Try pretrained T5 (base) model.

Example

D : A handful of other journalists and I had camped outside Basra for days, hanging back out of range of the mortars that puffed in the dry, empty land. We spent our time interviewing the refugees that trickled out of the town or the British soldiers waiting to move in.

$\hat{h}_D$:

Work done

- Try pretrained T5 (base) model.

Example

D : A handful of other journalists and I had camped outside Basra for days, hanging back out of range of the mortars that puffed in the dry, empty land. We spent our time interviewing the refugees that trickled out of the town or the British soldiers waiting to move in.

$\hat{h}_D$:journalists had camped outside basra for days, hanging back out of range of mortars

Work done

- Try pretrained T5 (base) model.

Example

D : A handful of other journalists and I had camped outside Basra for days, hanging back out of range of the mortars that puffed in the dry, empty land. We spent our time interviewing the refugees that trickled out of the town or the British soldiers waiting to move in.

$\hat{h}_D$:journalists had camped outside basra for days, hanging back out of range of mortars

Problem: The input itself is already summarized. Fine-tuning?

Work done

- Fine-tune it

Example

D : A handful of other journalists and I had camped outside Basra for days, hanging back out of range of the mortars that puffed in the dry, empty land. We spent our time interviewing the refugees that trickled out of the town or the British soldiers waiting to move in.

$\hat{h}_D$:

Work done

- Fine-tune it

Example

D : A handful of other journalists and I had camped outside Basra for days, hanging back out of range of the mortars that puffed in the dry, empty land. We spent our time interviewing the refugees that trickled out of the town or the British soldiers waiting to move in.

$\hat{h}_D$:we spent our time interviewing the refugees that trickled out of Basra.

Work done

- Fine-tune it

Example

D : A handful of other journalists and I had camped outside Basra for days, hanging back out of range of the mortars that puffed in the dry, empty land. We spent our time interviewing the refugees that trickled out of the town or the British soldiers waiting to move in.

$\hat{h}_D$:we spent our time interviewing the refugees that trickled out of Basra.

Problem: Problem with fine tuning? Summarization can't generate the title?

To-do

- Fine-tune T5 model (This week)

To-do

- Fine-tune T5 model (This week)
- Replicate the model from [See et al., 2017] for reference (Next week)

To-do

- Fine-tune T5 model (This week)
- Replicate the model from [See et al., 2017] for reference (Next week)
- Create GAN model on top/try to change the model to min-max optimization (This week + Next week)

To-do

- Fine-tune T5 model (This week)
- Replicate the model from [See et al., 2017] for reference (Next week)
- Create GAN model on top/try to change the model to min-max optimization (This week + Next week)
- Evaluate and finalize the model (December)