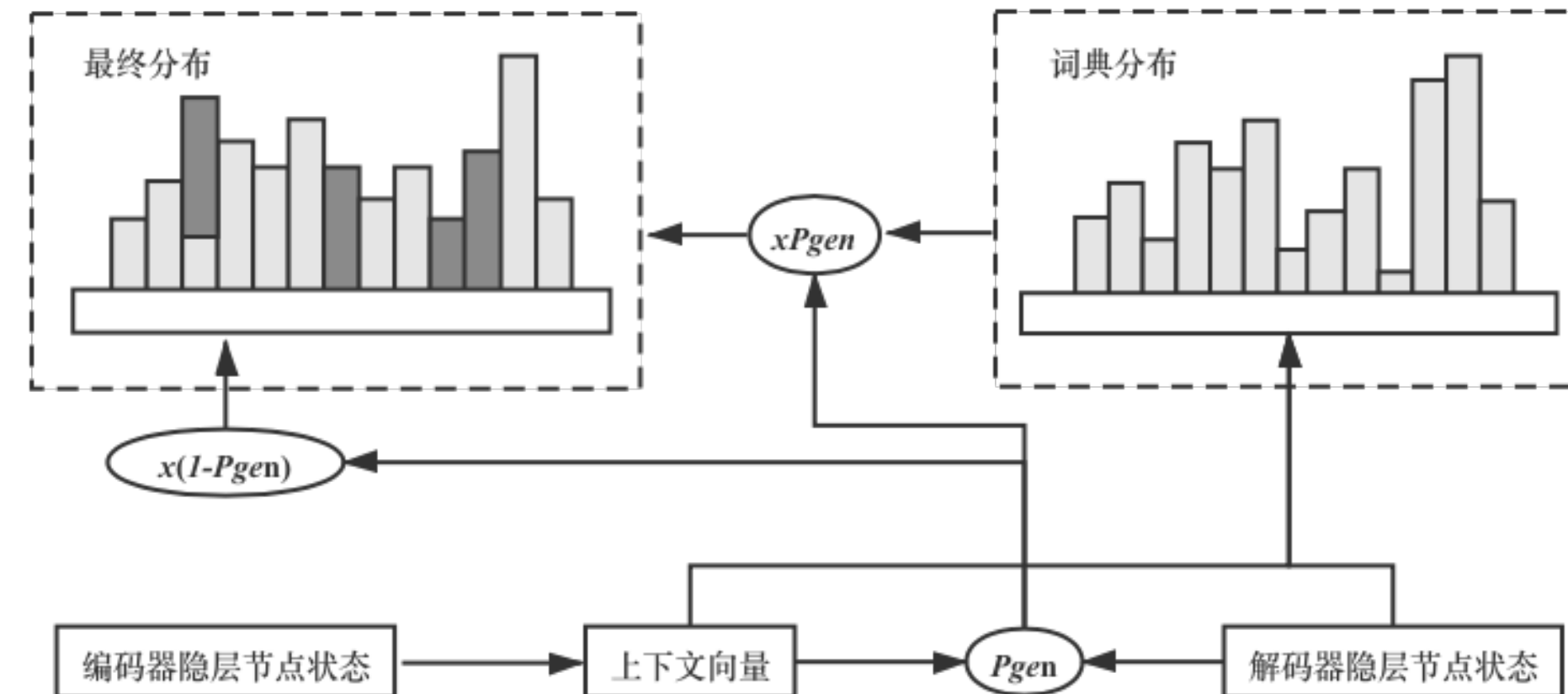


论文摘要

抽取式摘要可读性、准确性较差, 而生成式摘要也存在连贯性、逻辑性的不足。此外, 两种摘要方法的传统模型对文本的向量表示往往不够充分、不够准确。针对以上问题, 该文提出了一种基于BERT-SUMOPN模型的抽取-生成式摘要方法。模型通过BERT预训练语言模型获取文本向量, 然后利用抽取式结构化摘要模型抽取文本中的关键句子, 最后将得到的关键句子输入到生成式指针生成网络中, 通过EAC损失函数对模型进行端到端训练, 结合coverage机制减少生成重复, 获取摘要。

生成式模型

生成式模型部分采用指针生成网络模型, 对指针网络和基于注意力机制的序列到序列模型进行结合, 允许通过指针直接指向生成的单词, 也可以从固定的词汇表中生成单词。



为了实现模型的端到端训练, 使用EAC损失函数(Extractive-Abstractive-Coverage loss function)作为BERT-SUMOPN模型的损失函数, 通过最小化EAC损失函数同时训练抽取、生成式模型。

$$L_{eac} = \mu_1 L_{ex} + \mu_2 L_{ab} + \mu_3 L_{cov}$$

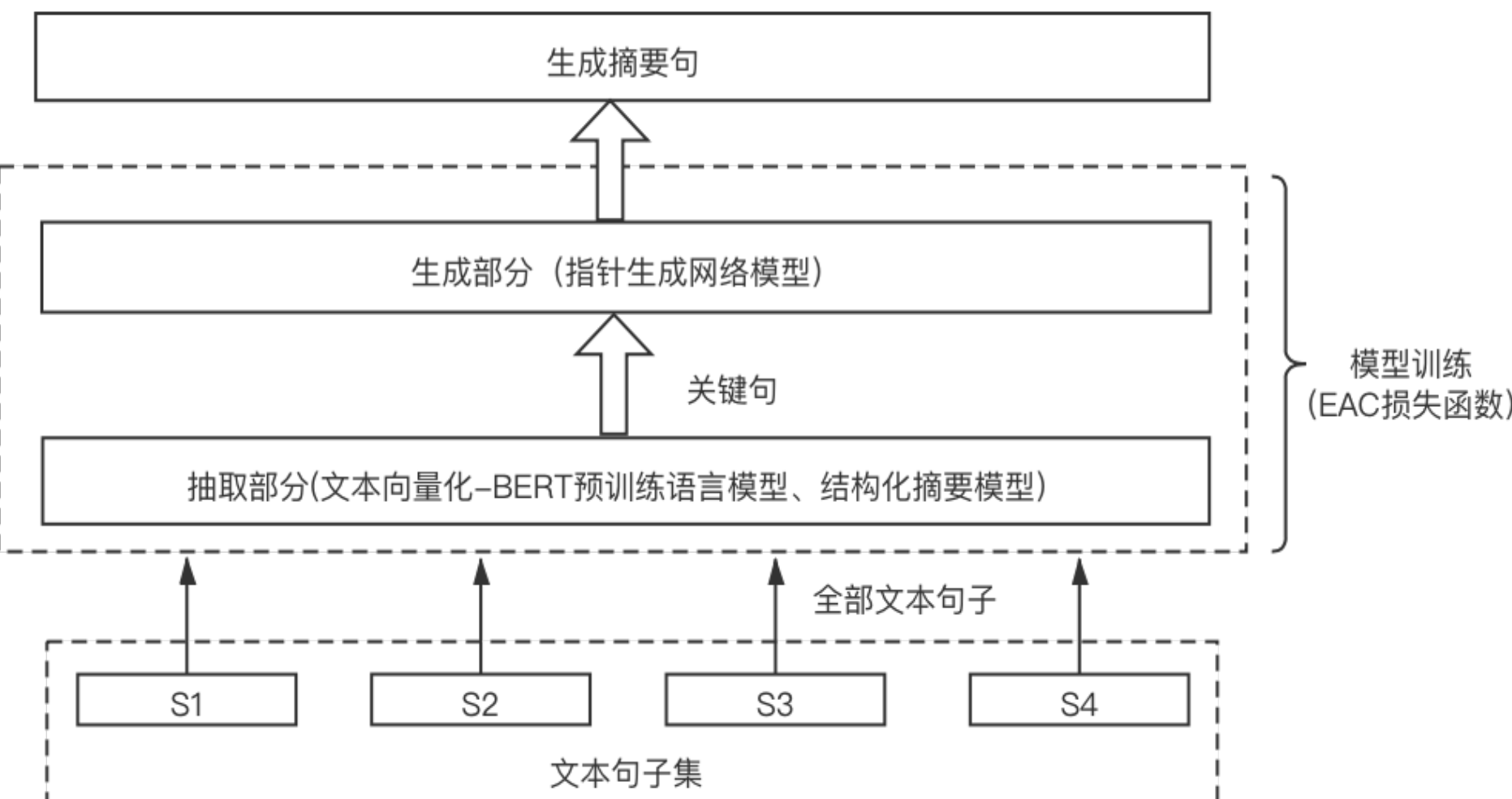
摘要模型对比

本文提出的BERT-SUMOPN模型(结合coverage机制)在BIGPATENT数据集摘要的ROUGE评分上效果最好, ROUGE-1和ROUGE-2得分分别提升了3.3%和2.5%。

	Method	ROUGE-1	ROUGE-2	ROUGE-L
Abs	Seq2Seq	27.98	7.64	24.15
	PGNet*	30.59	10.01	25.65
	PGNet-coverage*	37.12	11.87	32.45
	Point-Less	35.76	11.46	26.36
	Bottom-up	36.49	11.68	27.89
	S2S-ELMo	37.35	11.95	28.75
	TLM+E*	38.65	12.31	24.71
	end2end w/o inconsistency loss	38.26	12.15	32.69
Ext+Abs	rnn-ext-abs-RL-rerank	37.86	12.03	29.75
	BERT-SUMOPN(ours)	38.72	12.43	24.58
	BERT-SUMOPN+coverage(ours)	41.99	14.85	33.17

BERT-SUMOPN模型

提出一种基于BERT-SUMOPN模型的抽取-生成式文本自动摘要方法, 结合抽取式摘要模型和生成式摘要模型的优点, 有效提升摘要结果可读性、准确性、逻辑性。



抽取式模型

抽取式模型使用结构化注意力对基础树的根进行建模, 通过迭代的方法根据过去的内容推断复杂结构, 得到句子标签列表作为关键句抽取依据, 不需要得到摘要结果。

从摘要结果可以看出, BERT-SUMOPN模型生成的摘要包含更多关键信息, 对原文的理解更加充分, 生成的摘要内容更加准确、流畅, 具有较好的逻辑性。

Source patent document: present invention provided an apparatus for making a non - woven sheet in which the inoperability of one or more assemblies can be offset, and the non - woven sheet product will still be commercially acceptable .the apparatus of the present invention adjusts the trajectory path of the web coming from an assembly causing the web to cover, or in conjunction with other assemblies, the area on the collection surface that would have been covered by the inoperative assembly. in practice when one or more assembliesthe assemblies and collection belt speed may be adjusted by a suitable computer control. fig1 and 3 combine to show a preferred embodiment of the invention. the assembly 10 consists of a stationary frame 11, on which is mounted a pivot plate 12 on which is mounted a baffle 20 which may be rotated by drive motor 21 (shown only in fig3). an annular target plate 26 is also mounted on pivot plate 12.....polymer solution from a supply source not shown is fed to spinneret pack 22 and through spinneret orifice 23. the extrudate from the spinneret orifice 23 is a plexifilamentary strand 24 entrained in a stream of high velocity gas. the plexifilamentary strand entrained in the gas strikes the contoured surface of rotating baffle 20 at point a. the strand along with the gas is deflected.....

Gold summary: an apparatus for adjusting the path that a web formed by striking a contoured surface baffle will take as it descends to a collection surface , in which the baffle is mounted on a pivot plate which will pivot and cause the web to leave the contoured surface baffle at the desired angle .

BERT-SUMOPN+coverage summary: the apparatus of the present invention adjusts the trajectory path of the web coming from an assembly causing the web to cover, the area on the collection surface that would have been covered by the inoperative assembly. the assembly consists of a stationary frame, on which is mounted a pivot plate, on which is mounted a baffle which may be rotated by drive motor. the plexifilamentary strand entrained in the gas strikes the contoured surface of rotating baffle at point a.

PGNet summary: the present invention adjusts the trajectory path of the web coming from an assembly causing the web to cover. an annular target plate is mounted on pivot plate. attached to the pivot plate is curved vee rail resting on and engaging rollers and which are mounted on stationary frame as is guide roller resting on and engaging the top of the vee rail. the strand along with the gas is deflected into a generally vertical plane and spread to form a web which is oscillated from side to side as the baffle rotates.

S2S-ELMo summary: present invention provided an apparatus for making a non-woven sheet in which the inoperability of one or more assemblies can be offset. the apparatus of the present invention adjusts the trajectory path of the web coming from an assembly causing the web to cover. for adjusting the position of the web, the pivot plate is pivoted right or left from its center position to deflect the web to a new position for adjusting the local basis weight across the sheet being formed.

论文结论

本文提出了一种基于BERT-SUMOPN模型的抽取-生成式摘要方法, 使用BERT预训练模型进行文本向量化, 将抽取式模型抽取的关键句输入到生成式模型中获取摘要, 并结合coverage机制减少生成重复。实验表明, 该模型在BIGPATENT数据集上取得了很好的效果。

在未来的工作中, 我们将继续尝试利用其他方法(强化学习等)对抽取式模型和生成式模型进行端到端训练, 提升摘要结果的准确性、流畅性。