NLP Assignment_3_Report

20201036 Dohoon Kim(김도훈)

Problem 2-1. Fine-Tune The Pre-Trained Model with My Text

Purpose of Choosing Data.

For my own data, I choose 'Al Jazeera English Israel Gaza War from 7th Oct 23' made by Inacio Vieira from Kaggle. This dataset contains the whole of Al Jazeera English's Israel Gaza War tag collection spanning from 2020 to April 2024[1]. I extracted headlines and articles from dataset, then made it as text file. There are three reasons for choosing the dataset.

1. Israel and Palestine war is ongoing and there is too much information about this war. Besides, to understand conflict between two countries, a lot of background knowledge is needed. There will be someone who tries to catch what happened in Gaza, but either lacks background information or time to read all the articles. Then it will be a good choice to ask GPT about this subject. I want to fine tune language model and ask to generate summary and opinions by making prompting as 'When briefly explain about this war' and 'My opinion about Israel Palestine war is'.

2. I tried to make hallucination and generate fictional war using language model on purpose. When ChatGPT appeared, what I found most interesting was that it generates explanation about events that did not really happen. It is called 'hallucination' of AI. This effect is considered as a shortage of GPT model and thought that it needed to be fixed. But for me, it was quite interesting since it seems that the model write fiction about arbitrary keywords.

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[1] https://www.kaggle.com/datasets/inaciovieira/al-jazeera-english-israel-gaza-war-from-7th-oct-23

However, the aspect of hallucination is much improved. So, I tried to resurrect hallucination of language model and wrote fiction with prompt such as "Sogang Yonsei war is".

3. I tried to compare Israel Palestine war to past war. The pre-trained GPT-2 model already learned information about historical events. Therefore, newly trained model can figure out commonalities and differences between Israel Palestine war and other wars in history. In my case, I wanted to compare the war with Korean war. So, the prompt is "Difference between Korean war and Israel Palestine war".

#Expectation

1. For the first prompt, this model will provide short summarization of ongoing war, and for second, it will provide integration of hidden opinion of article from Al Jazeera. Even though Al Jazeera is known as its objectivity, it is based in Muslim society, Doha, Qatar, many of articles will contain pro-Palestinian tendencies. Therefore, there will be a bias in defending the Palestine. Result will be different when using articles of other broadcasting stations.

2. It will create likely story about 'Sogang Yonsei war' and this story might share a lot of similarities with ongoing war. Otherwise, the model might recognize the event as sub-war of Israel Palestine war and generate summarization of a real event.

3. The model will successfully recognize Korean war and explain both wars and find differences.

#About Training Loop

1. Iterating Over Training Data: The training loop iterates 'num_iteration' times over the training dataset. Inside the loop, it fetches batches of data from the 'train_loader'.

2. Forward Pass: For each batch of data, the model is applied to the batch,

producing logits (unscaled probabilities) for the next word in the sequence. 'cuda()' is used to move both the model and the batch of data to the GPU for processing.

3. Calculating Loss: The predicted logits are transformed into probabilities using a log-softmax function. Then, the negative log probability of the correct word in the sequence is computed. This serves as the loss for the current batch.

4. Backpropagation and Optimization: The gradients of the loss with respect to the model parameters are computed using backpropagation (loss.backward()). Then, the optimizer updates the model parameters based on these gradients to minimize the loss (optimizer.step()). Finally, gradients are reset to zero (optimizer.zero_grad()) to prepare for the next iteration.

5. Recording Loss: The value of the loss for the current iteration is appended to loss_record.

Problem 2-2. Generating Text with Fine-Tuned Model

#Why These Are Interesting?

1.

```
your_prompt = "When summerize about Israel Palestine war" # caution: Do
not add blank space at the end of the prompt
your_max_length = 100
your_num_sequences = 3

generator(your_prompt, max_length=your_max_length,
num_return_sequences=your_num_sequences)
```

Setting `pad_token_id` to `eos_token_id`:50256 for open-end generation.
[{'generated_text': 'When summerize about Israel Palestine war, there was a lot of talk that the Biden administration was going to use the cold war to try and avoid a major escalation in the war. Not to mention the very real danger of an escalation that could turn into war. The only way to end what has long been one of the most brutal military campaigns of our era to end the war is through a comprehensive but comprehensive international agreement with Israel. The United States has made no secret of its continuing opposition to Israel'},

{'generated_text': 'When summerize about Israel Palestine war, we often hear our children ask us? do you believe Israel's war in Gaza is a necessary end to its military capabilities and siege?? what does the country think is Israel's occupation of Palestinian lands and territorial integrity and its subsequent restrictions on freedom, territorial integrity and territorial integrity. What we know from our own experiences and our history, as children, is that it is not the right time for our children to become soldiers, soldiers, policemen'},

{'generated_text': 'When summerize about Israel Palestine war, our sense of community here is not as strong a lot of these days. Palestine is a Palestinian nation

under occupation. ==The Palestinians did not have a homeland to sustain themselves. The occupation doesn't matter, and you cannot replace us." With that in mind, I wrote this list of political views that Israel has not yet fully embraced.== They're also not the only ones that will not change their position. Last year, for example,'}]

```
your_prompt = "My opinion about Israel Palestine war is" # caution: Do
not add blank space at the end of the prompt
your_max_length = 100
your_num_sequences = 3

generator(your_prompt, max_length=your_max_length,
num_return_sequences=your_num_sequences)
```

Setting `pad_token_id` to `eos_token_id`:50256 for open-end generation.
[{'generated_text': 'My opinion about Israel Palestine war ==is very bad==. This conflict is going on for generations, which is why we launched ==the International Organization for Migration (IoMTO)== to save Palestine for the present era." WCK says it will be donating humanitarian relief supplies via a voluntary donor if Israel invades Rafah and releases the remaining captives. "==We are looking at ways in which we can provide assistance that can alleviate some of the greatest suffering==, whether internally displaced persons or in war-'},

  {'generated_text': 'My opinion about Israel Palestine war is that it is Israel's occupation of the land it occupies. This is the view of others, but in ==Palestine for us as Palestinian people, we lived at the beginning of this genocide for 10 years. To be honest, I feel like I am only being very vague.== I want to make a statement to be clear: Israel is not a human entity in this conflict. A true representative of the Palestinian people is to take this opportunity to shine a spotlight on'},

  {'generated_text': 'My opinion about Israel Palestine ==war is very disappointing because the war is in response to Palestinian people who have always sought peace in Palestine.""==,,,, UK's arguments on 'deliberately misleading news' on Gaza and West's war","The government of Prime Minister Rishi Sunak is defending a March 4 publication used by the International Herald Council (IHGC) as a "deliberately misleading news story" that would "expand the'}]

As seeing results, the model generates more pre-Palestinian than Israel. In yellow highlighted parts, they contain negative position about Israel and US and sympathy to Palestinian. On the other hand, in magenta highlighted part, contain somewhat neutral position, but mostly the generated texts are appealing about violence of Israel.

2.

```
your_prompt = "Sogang Yonsei war is" # caution: Do not add blank space
at the end of the prompt
your_max_length = 100
your_num_sequences = 3

generator(your_prompt, max_length=your_max_length,
num_return_sequences=your_num_sequences)
```

Setting `pad_token_id` to `eos_token_id`:50256 for open-end generation.
[{'generated_text': 'Sogang Yonsei war is not at the margin of war for ==Netanyahu==. But it is ==not stopping Gaza from deteriorating into a famine==. Against that backdrop, Israeli Prime Minister Benjamin Netanyahu is appealing in the hope that an agreement is reached between Netanyahu and Hamas in exchange for the release of all Israeli captives. While there is no immediate date for when the swap would be done, Israel is under pressure now to fulfil its key objectives of crushing Hamas and freeing prisoners in Gaza. "It is a'},
  {'generated_text': 'Sogang Yonsei war is forbidden in China and, if they live in a country full of hostile regimes, be it under friendly oppression from the Chinese's Chinese neighbours, it is forbidden in China." In 2018, the group was banned from meeting Mao Zedong, the head of the People's Liberation Army (LPLA), and other leaders during the Cultural Revolution. China's suppression of nationalism and anti-Western ideologies has been a core characteristic of this'},
{'generated_text': 'Sogang Yonsei war is a "freedom fighter" conflict? It is not a conflict we have all been facing, with our bodies left abandoned while still alive over six months of war, but ==Hamas== wants to bring back the remaining captives and return to terms with the group of its own. ==Hamas wants to destroy and destroy the Egyptian military== and security establishment and, crucially, bring back the remaining hostages, including another captive, who will only be freed by Israel's sole'}]

Overall, it came out differently than expected. The yellow underlined part shows that the model recognized the 'Sogang Yonsei war' as part of the 'Israel Palestine war'. The blue part is the part that has nothing to do with the 'Israel Palestinian' war. This text distorted historical facts and described them as true, and the part was the most similar to my prediction. However, I failed to create a completely new story through this work.

```
your_prompt = "Difference between Korean war and Israel Palestine war"
# caution: Do not add blank space at the end of the prompt
your_max_length = 100
your_num_sequences = 3

generator(your_prompt, max_length=your_max_length,
num_return_sequences=your_num_sequences)
```

Setting `pad_token_id` to `eos_token_id`:50256 for open-end generation.
[{'generated_text': 'Difference between Korean war and Israel Palestine war, ==it is difficult to know the reasons behind those positions==. The US was aware of the plight of the Palestinian people as it prepared to invade the territory. ==South Korea has a history of placing humanitarian aid on the shoulders of Palestinians, though it does not consider South Korea a serious threat.== The ruling Workers' Party in the ==Workers' Party of Korea== strongly supported the Palestinian cause and opposed the invasion. Meanwhile, Indonesia's Ministry of Foreign Affairs'},
  {'generated_text': 'Difference between Korean war and Israel Palestine war, it is also a longstanding doctrine that the US can't unilaterally order a change. Since 1979, this doctrine has existed across many fronts, and it's often a cornerstone of American foreign policy. At the root?anti-US bias has long been US foreign policy. While the

Reagan administration sought to isolate Chinese influence in the West over issues like Middle East security, it was also known as the Vietnam War, or, of course,'},
  {'generated_text': 'Difference between Korean war and Israel Palestine war," Al-Jafar said. <mark>"That is why the South China Morning Post editorial embargo was lifted, and we regret that this embargo was lifted and that this missive has been updated."</mark> The boycott also includes South Korea's domestic product Lula and her father, the <mark>former South Korean premier Kim Jong Un</mark>. The boycott comes following the release of the?10th South Korean Nobel Peace Prize on Monday. The first'}]

When looking at result, it seems that the model does not have understanding about Korean war. The yellow underlined parts indicate wrong information of Korean war and South Korea (e.g. former South Korean premier Kim Jong Un). In order to accomplish this task smoothly, I have to fine-tune the model again with information about Korean war.