

YAI 15th toy project

Fake News Detection with Golden Evidence

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Introduction

가짜 뉴스(Fake news)

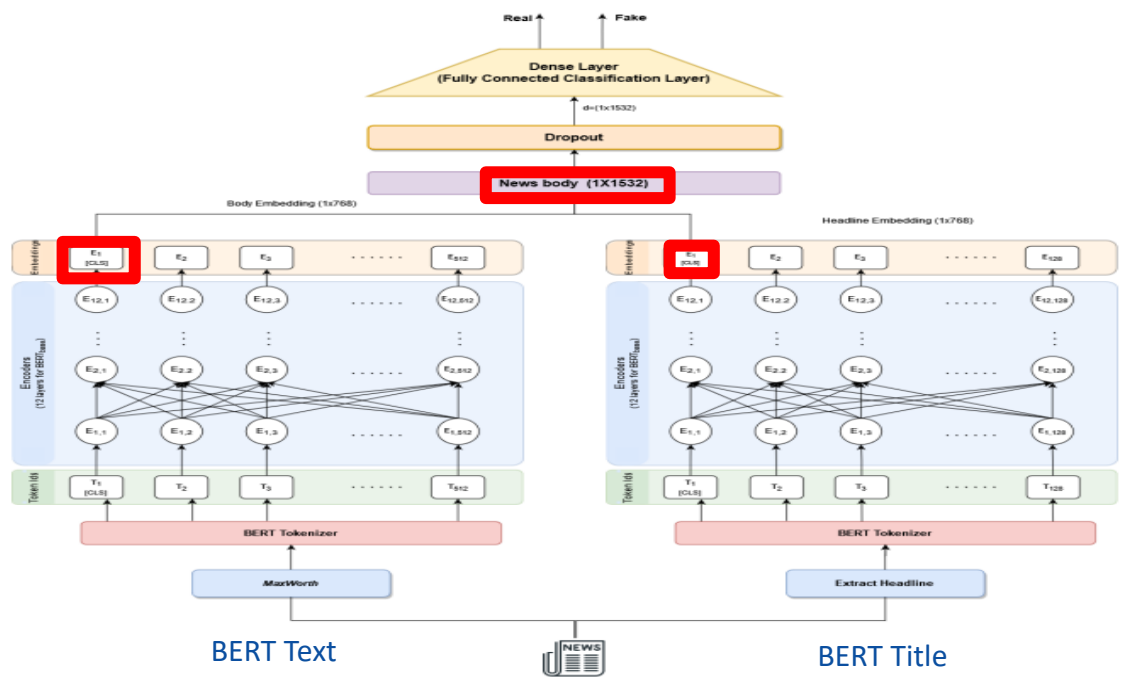
“뉴스로 제시된 허위 또는 오해의 소지가 있는 정보” – Wikipedia

가짜 뉴스 판별 전략

- 뉴스 자체의 어투/패턴 : 다양한 데이터셋을 통해 학습
- 사실과의 일치여부 : 시의성 있는 사실 자료 없이는 판단이 어려움
⇒ Evidence based 접근

Background

Dual BERT



	precision	recall	f1-score	support
0	0.99	0.97	0.98	3523
1	0.97	0.99	0.98	3212
accuracy			0.98	6735
macro avg	0.98	0.98	0.98	6735
weighted avg	0.98	0.98	0.98	6735

Kaggle Dataset

	precision	recall	f1-score	support
0	0.54	0.74	0.62	242
1	0.58	0.36	0.44	240
accuracy			0.55	482
macro avg	0.56	0.55	0.53	482
weighted avg	0.56	0.55	0.53	482

Other dataset

Background

LLM with RAG

You are responsible for evaluating the credibility of a news article. Your task is to critically assess whether the given news aligns with facts, logic, and established patterns of misinformation.

Evaluation Criteria:

1. ****Lack of Factual Basis****: Does the article make claims without clear sources or evidence?
2. ****Logical Fallacies****: Are there exaggerated or unnatural cause-effect relationships?
3. ****Bias and Framing****: Does the article present a one-sided narrative while omitting counterarguments?
4. ****Pattern Recognition****: Does the article resemble past misinformation or hoaxes?

Input:

News Article:

"{news_text}"

Retrieved News:

{retrieved_news}

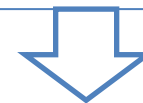
Assessment:

- ****1**** = Completely False (No factual basis, likely misinformation)
- ****5**** = Uncertain (Some facts may be true, but unverified claims exist)
- ****9**** = Highly Plausible (Strong evidence and logical consistency)

Be as ****conservative**** as possible in your rating.

- Google에 title 기반 search
- 논문(Chen et.al)의 fake news 판단 기준 반영

=> 1-9점 척도로 출력, 가장 정확도 높은 역치 설정



1. 긴 title의 경우 search 결과가 나오지 않음
2. 긴 추론시간 : News 1개 당 15-20초
3. API 비용 부과
4. 정해진 양식 따르지 않는 hallucination
5. 그럼에도 높은 성능 => 이유 설명 불가

Best Threshold: 7

	threshold	accuracy	precision	recall	f1_score	roc_auc
6	7	0.949896	0.946281	0.954167	0.950207	0.949887

> 모델 평가 결과

> 프롬프트

Chen, S., Huang, Y., & Dhingra, B. (2024). Real-time Fake News from Adversarial Feedback. *arXiv preprint arXiv:2410.14651*.
<https://arxiv.org/pdf/2410.14651v2>

Objective

“신뢰성 있는 추론”

- RAG(검색-증강 생성): 근거 문장 추출
- BERT 기반 모델: LLM의 할루시네이션 문제를 회피

“가볍고 (계산 비용)효율적인 모델”

- BERT 기반 모델

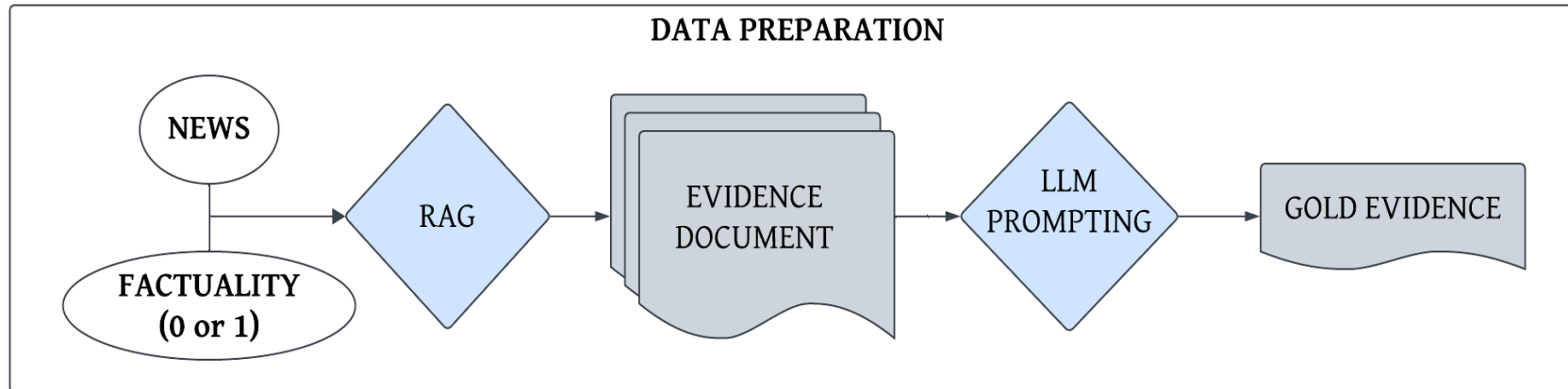
“해석 가능한 모델”

- 핵심 근거 문장 추출 (golden evidence)
- BERT 기반 모델 (LLM은 blackbox)

Data Preparation

Fake News Dataset

- 87175개 public NEWS dataset with Factuality label(0 or 1)
- Preprocessing : 소문자화, 구두점 제외 다른 문장부호/링크 제거, title이 있을 시 포함
- 87175개의 데이터 중 1336개의 데이터를 무작위로 추출하여 학습을 위한 evidence document와 gold evidence를 준비



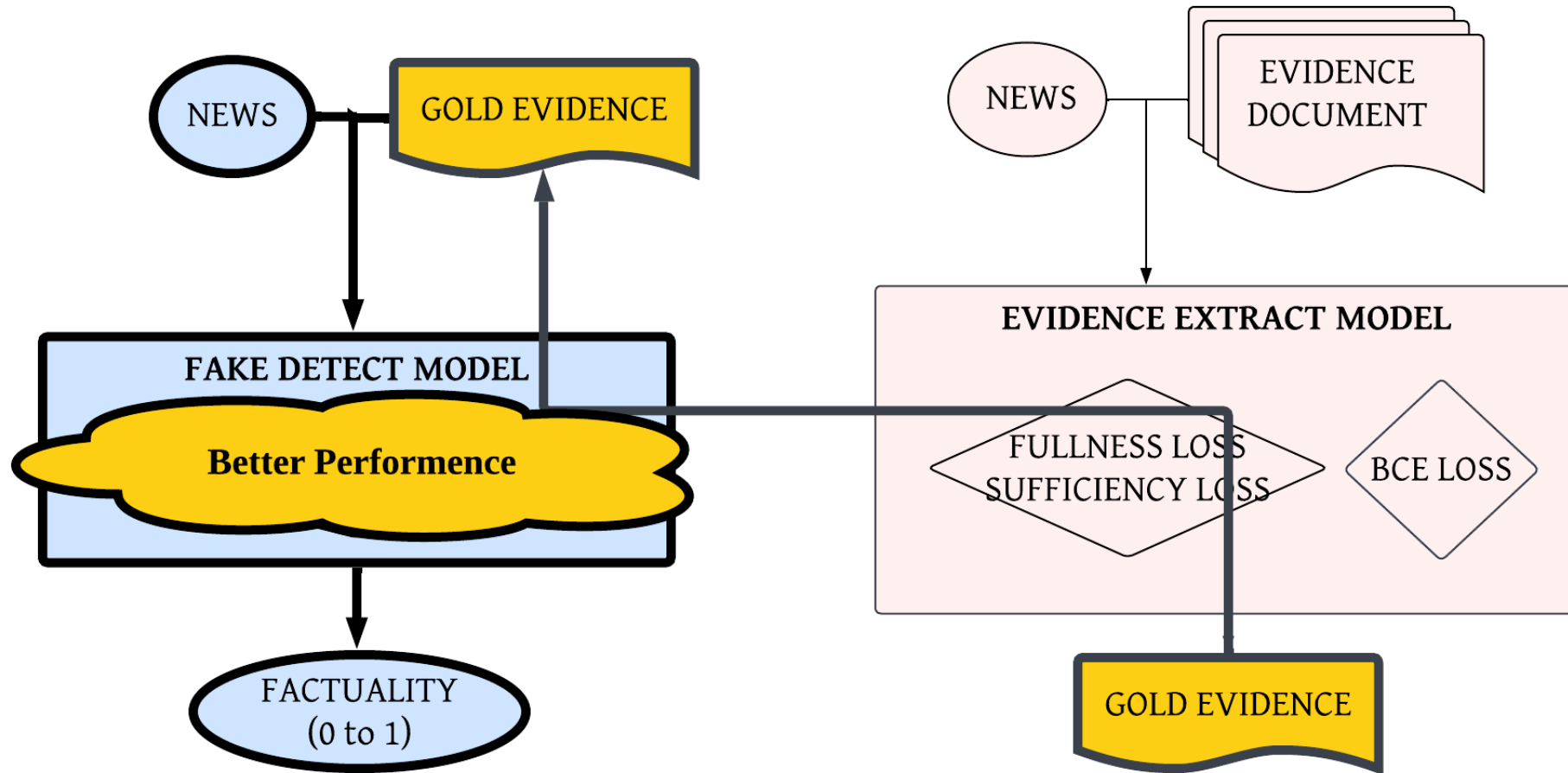
> Overall Flowchart

<https://huggingface.co/datasets/BeardedJohn/FakeNews>
<https://www.kaggle.com/datasets/climentbisailon/fake-and-real-news-dataset>
<https://web.eecs.umich.edu/~mihalcea/downloads/fakeNewsDatasets.zip>

> Data source

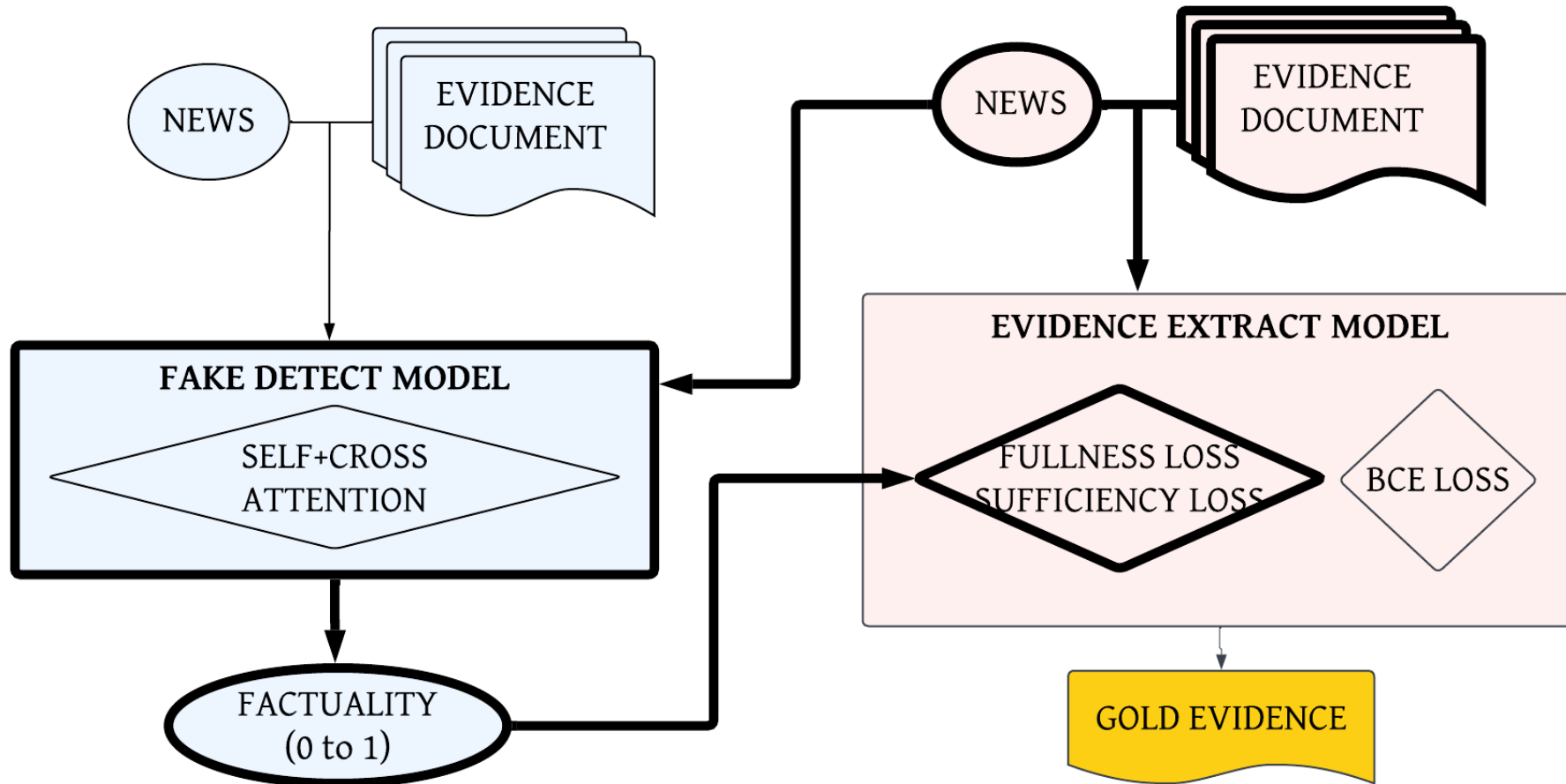
Model Overview

Inference Architecture



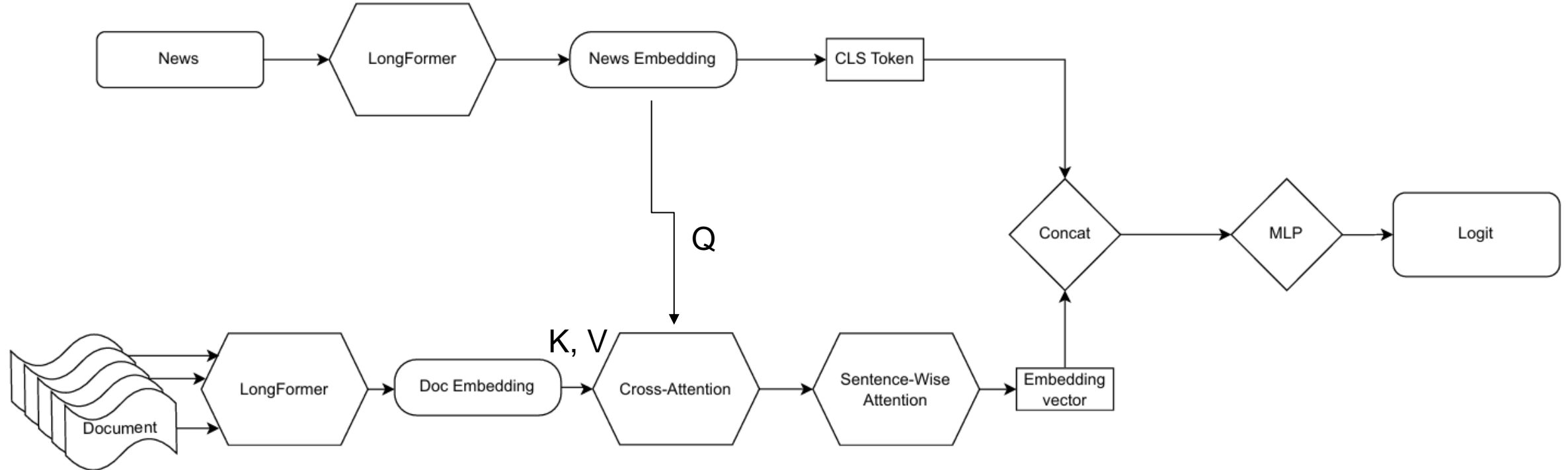
Model Overview

Training Architecture



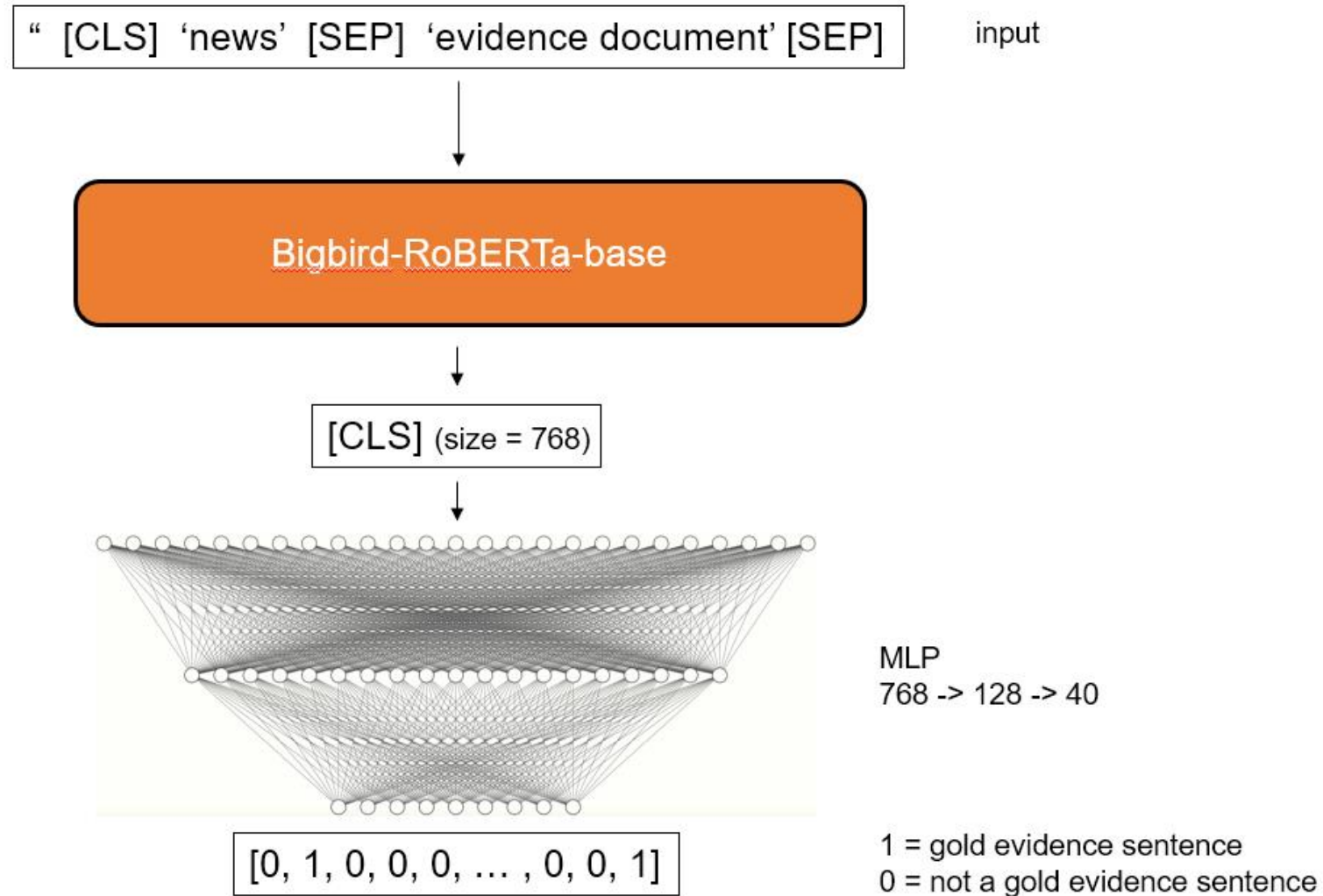
Fake Detect Model

Model Architecture



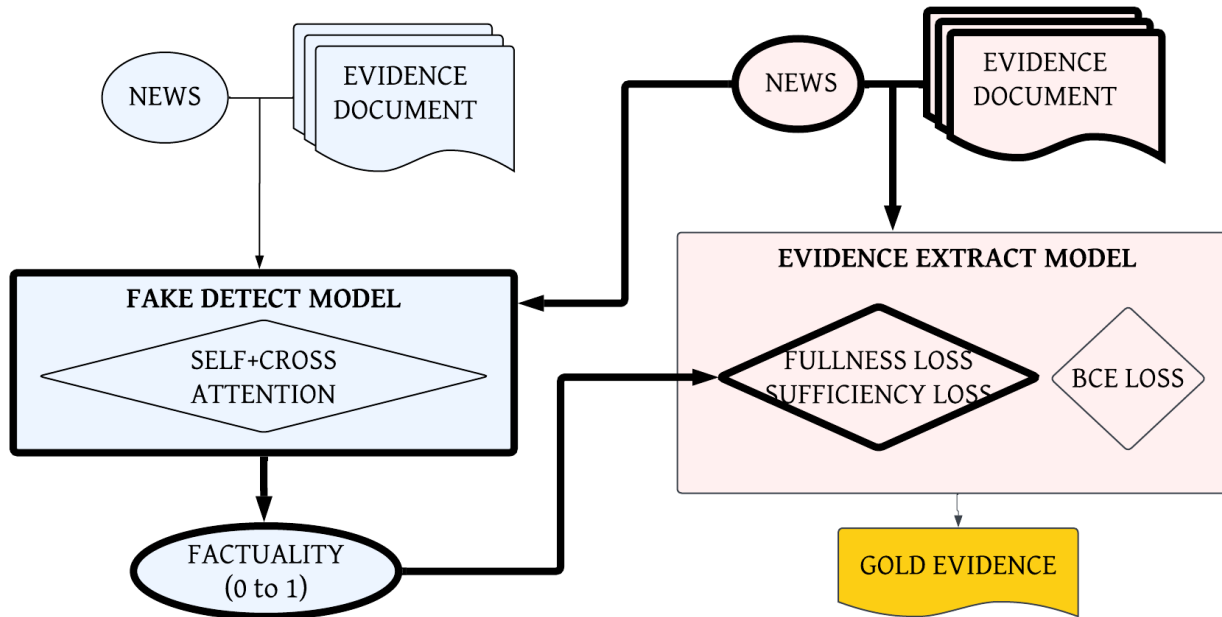
Evidence Extractor Model

Model Architecture



Evidence Extractor Model

Loss Function



1. Loss_fullness

- 전체 evidence doc 사용
vs. golden evidence 제거 evidence doc 사용
- $L_{fullness} = P_{original_doc} - P_{mani_doc}$

2. Loss_sufficiency

- 전체 evidence doc 사용
vs. golden evidence만 사용
- $L_{suff} = P_{original_doc} - P_{mani_doc}$

3. Final Loss (& BCELoss)

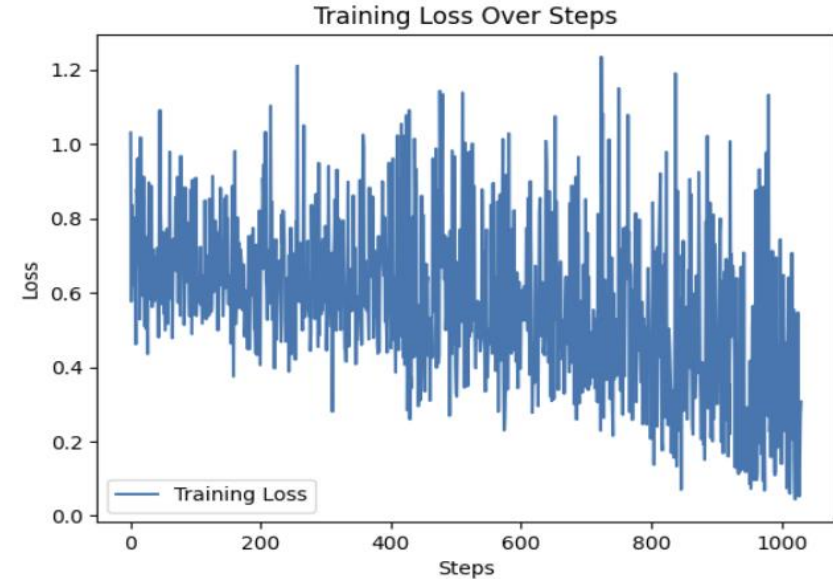
- $L = 0.7 * L_{BCE} + 0.3 * (L_{suff} - L_{fullness})$

Experiment & Result

Fake Detect Model

He is of Scots-Irish and English descent.	
In 1956, his family moved to Louisville, Kentucky,...	
He was president of the Student Council of the Col...	
From 1968 to 1970, McConnell worked as chief legis...	
During the same period, he taught a night class on...	
In October 1974, McConnell returned to Washington ...	
McConnell has widely been described as an obstruct...	
Mitch McConnell: Addison Mitchell McConnell III (:...	
McConnell is in his seventh Senate term and is the...	
He served from 2007 to 2025 as the leader of the S...	
McConnell holds conservative political positions, ...	
He led opposition to stricter campaign finance law...	
McConnell worked to withhold Republican support fo...	
During the first Trump administration, the Senate ...	
McConnell invoked the nuclear option to eliminate ...	
While supportive of most of Trump's domestic and f...	
In late 2024, McConnell wrote an essay on his curr...	
In 2015, 2019 and 2023, Time listed McConnell as o...	
On February 28, 2024, McConnell announced that he ...	
An internal election to fill the post of Senate Re...	
On February 20, 2025 (his 83rd birthday), McConnel...	

뉴스-증거 문장 관련성 가중치



Classification Report:

	precision	recall	f1-score	support
0	0.60	0.96	0.74	102
1	0.91	0.38	0.53	106
accuracy			0.66	208
macro avg	0.75	0.67	0.64	208
weighted avg	0.76	0.66	0.63	208

학습 결과

Experiment & Result

Evidence Extractor Model

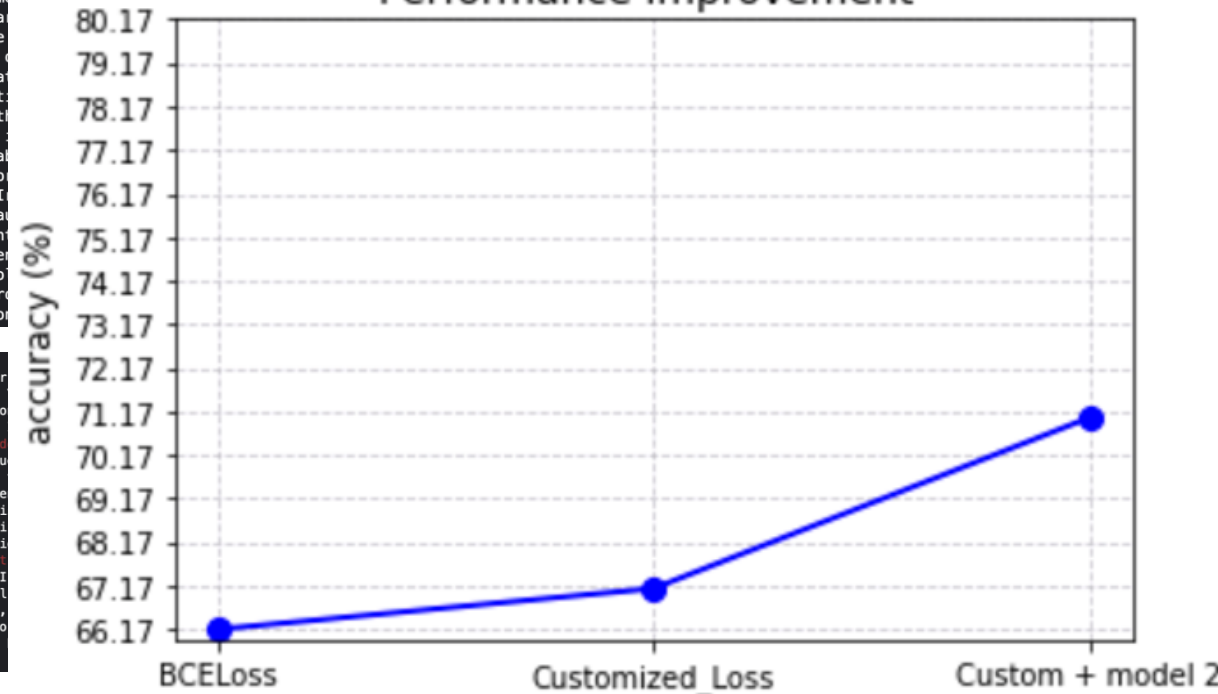
["Iran rejected on Sunday a call by French President Emmanuel Macron for talks on Tehran's ballistic missiles, saying they were defensive world powers.", "On Thursday, Macron said during a visit to Dubai that he was very concerned by Iran's ballistic missile program.", "He mentioned a missile fired from Yemen's Houthi rebels with a missile that was fired into Saudi Arabia in July.", "The U.S. called for the United Nations to hold Tehran accountable for violating U.N. Security Council resolutions.", "Saudi Arabia and its allies accuse Iran of supplying missiles and other weapons to the Houthis.", "They say the arms were not present in Yemen before conflict broke out there in 2015.", "Iran denies the charges and blames the conflict on Riyadh.", "The United States has imposed unilateral sanctions on Iran, claiming its missile program is essential for its national defense.", "This resolution calls on Tehran not to undertake activities related to missiles capable of delivering nuclear weapons.", "Iran says its missile program is defensive.", "It states that it has no plans to build nuclear-capable missiles.", "Iran's ballistic missile program has been a source of contention between Iran and various world powers.", "Macron's statements reflect growing international concern about Iran's military capabilities.", "Iran's view is that its missile program is essential for its national defense.", "The U.S. has a historical pattern of accusing Iran of supporting proxy groups in the region.", "Saudi Arabia's accusations align with its broader narrative against Iran.", "The Houthi movement, backed by Iran, continues to receive international attention amid ongoing conflicts in Yemen.", "There is a complex geopolitical landscape involving Iran, Saudi Arabia, and proxies like the Houthis.", "These dynamics have heightened tensions and contributed to calls for negotiations and potential sanctions.", "The situation showcases the intersection of nuclear agreements and defense matters in international politics.", "Iran's refusal to negotiate defense aspects signals a commitment to its regional strategy.", "Macron's calls for discussions indicate a response to perceived threats from Iran's missile capabilities.", "International relations are heavily influenced by military developments in the Middle East.", "Negotiations regarding arms and defense remain contentious and fraught with challenges.]

GOLD EVIDENCE SENTENCES

Iran rejected on Sunday a call by French President Emmanuel Macron for talks on Tehran's ballistic missiles, saying they were defensive and unrelated to a nuclear world powers., On Thursday, Macron said during a visit to Dubai that he was very concerned by Iran's ballistic missile program., He mentioned a missile fired from Yemen's Houthi rebels with a missile that was fired into Saudi Arabia in July., The U.S. called for the United Nations to hold Tehran accountable for violating U.N. Security Council resolutions., Saudi Arabia and its allies accuse Iran of supplying missiles and other weapons to the Houthis., They say the arms were not present in Yemen before conflict broke out there in 2015., Iran denies the charges and blames the conflict on Riyadh., The United States has imposed unilateral sanctions on Iran, claiming its missile program is essential for its national defense., This resolution calls on Tehran not to undertake activities related to missiles capable of delivering nuclear weapons., Iran says its missile program is defensive., It states that it has no plans to build nuclear-capable missiles., Iran's ballistic missile program has been a source of contention between Iran and various world powers., Macron's statements reflect growing international concern about Iran's military capabilities., Iran's view is that its missile program is essential for its national defense., The U.S. has a historical pattern of accusing Iran of supporting proxy groups in the region., Saudi Arabia's accusations align with its broader narrative against Iran., The Houthi movement, backed by Iran, continues to receive international attention amid ongoing conflicts in Yemen., There is a complex geopolitical landscape involving Iran, Saudi Arabia, and proxies like the Houthis., These dynamics have heightened tensions and contributed to calls for negotiations and potential sanctions., The situation showcases the intersection of nuclear agreements and defense matters in international politics., Iran's refusal to negotiate defense aspects signals a commitment to its regional strategy., Macron's calls for discussions indicate a response to perceived threats from Iran's missile capabilities., International relations are heavily influenced by military developments in the Middle East., Negotiations regarding arms and defense remain contentious and fraught with challenges.]

주요 증거 문장(golden evidence) 추론 결과

Performance Improvement



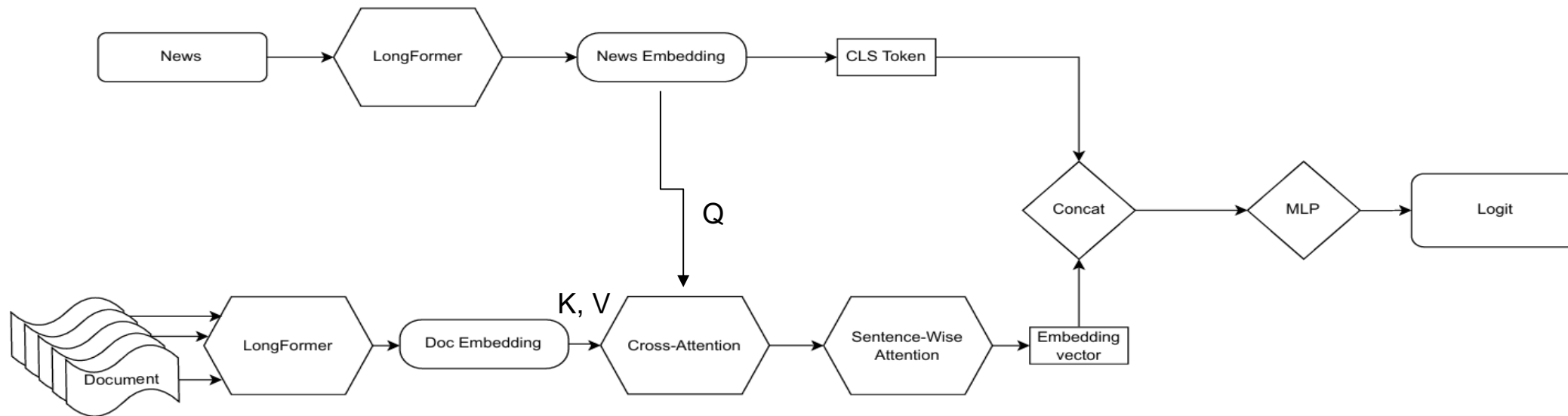
학습 결과

Summary

- 가짜 뉴스를 분류와 그 근거를 보여주는 모델 구조 구상하고 학습
- 신뢰성 있는 추론, 가볍고 효율적인 모델, 해석 가능한 모델 목표
- 뉴스 내용의 사실 확인을 위해 RAG를 통한 시의성 있는 사실 자료 이용
- Evidence Extractor Model과 Fake detect model, 두 모델을 이용하여 자료에서 중요한 문장들 (golden evidence)를 얻고 해당 문장들을 근거로 가짜 뉴스를 판별할 수 있도록 함.
- Evidence Extractor Model 학습 시에 Fake detect model를 이용하면 성능 향상이 가능함을 보임

Discussion

Model2가 학습되지 않는 이유?



Model2가 학습되지 않는 이유가 무엇인가?

- Document의 각 문장과 news 본문 전체가 모두 동일한 모델(LongFormer)를 이용함.
- cross-attention layer 하나의 cross attention만으로 구성됨
- news와 document간의 복잡한 관계: BERT의 표현 한계

Discussion

LLM에 대한 BERT의 차별점

LLM을 대신 BERT 모델을 사용하는 것의 장점이 있는가?

- 신뢰도 있는 이해와 해석: LLM의 hallucination 문제
- 분류 태스크에서의 강점: LLM 한계 - 생성 모델 특성상, 세밀한 텍스트 패턴을 구별하고 응답하는 능력이 fine-tuning된 RoBERTa보다 떨어질 가능성이 큼
- 적은 연산 자원에서 동작: LLM은 많은 메모리와 연산 비용이 필요
- mechanistic interpretability: LLM은 blackbox

하지만,

- LLM의 경량화: Distillation, Quantization, Efficient Architecture Design(sparse attention, LoRA)
- 하드웨어 발전: 시간이 지날수록 GPU의 메모리, 연산 속도 증가

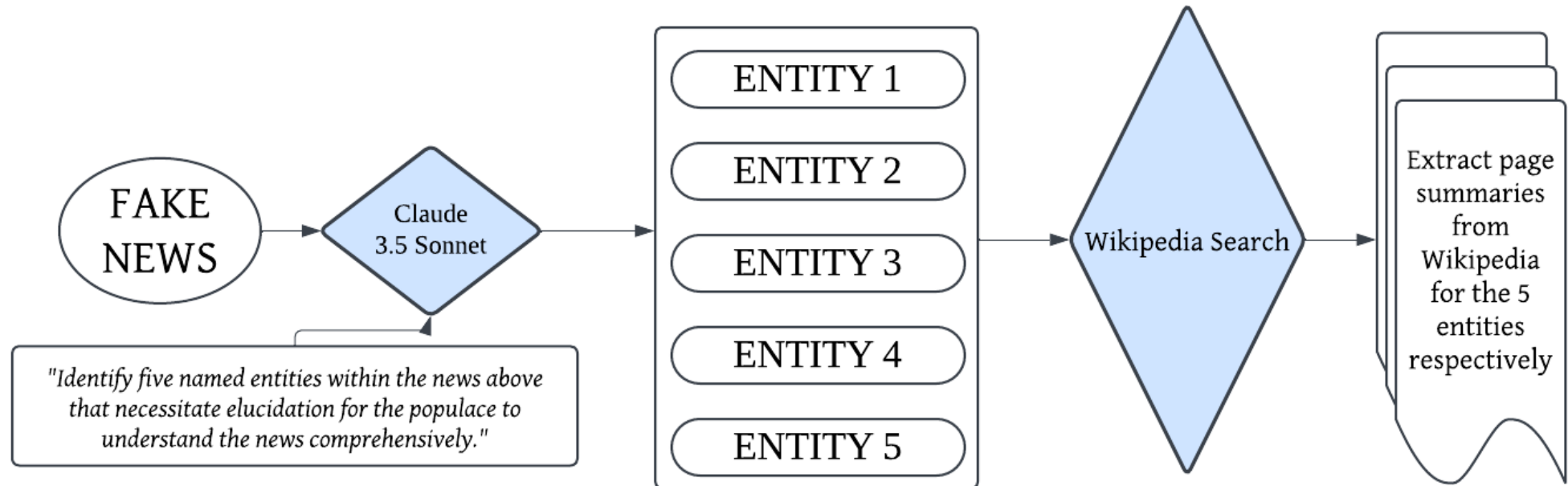
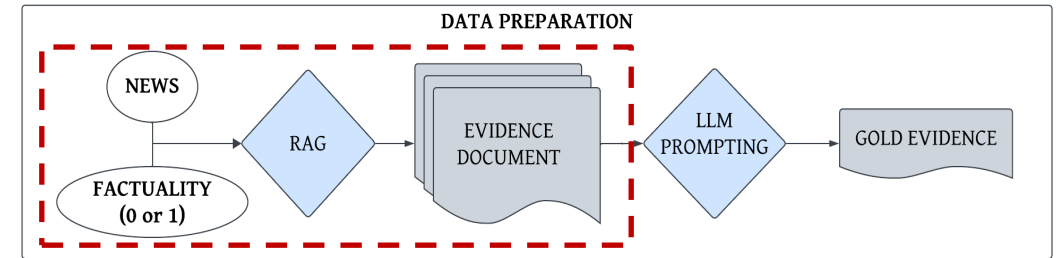
Thank You.

Appendix

Data Preparation

1) 위키피디아 검색을 활용한 뉴스 관련 Document 추출

- a) Fake news 각각에서 중요한 키워드 5개 선정
- b) 각 키워드(entity)를 위키피디아에 검색하여 상위 문서 요약

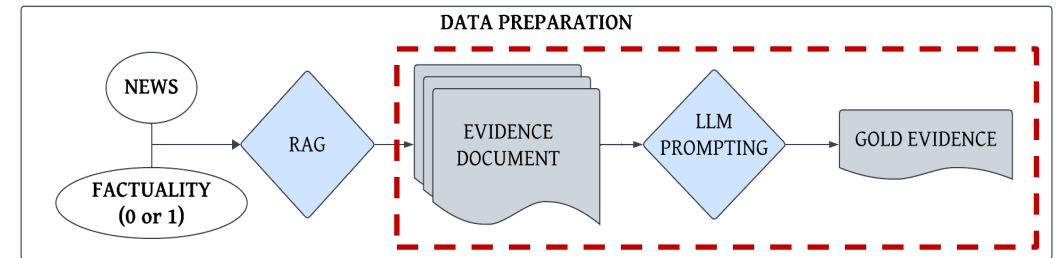


Appendix

Data Preparation

2) Noisy한 Evidence Document 중, 뉴스의 진위 판별에 중요한 ‘Gold Evidence’ 추출

- a) Wiki summary 중 진위판별에 중요한 문장(gold evidence) 추출
- b) a)의 gold evidence를 포함한, wiki_summary의 30문장 선택
- c) Gold evidence의 <summarized evidence sentences>에서의 index 추출



- **Role-based Prompting:** “학생이 evidence sentence로 진위 판별을 할 수 있게 돕는 선생님”로 역할을 부여.
- **Few shot Prompting:** 모범적인 답변 예시를 제시함으로써 답의 일관성/성능을 높임.
- **Chain of Thought :** 판단의 이유를 출력하게 하여 모델이 논리적으로 사고할 수 있게 함.



1. News
2. Factuality Label
3. Evidence by wiki : [sen1,sen2, ..., sen30]
4. Gold evidence Label : [0,0,1,0,...,1]

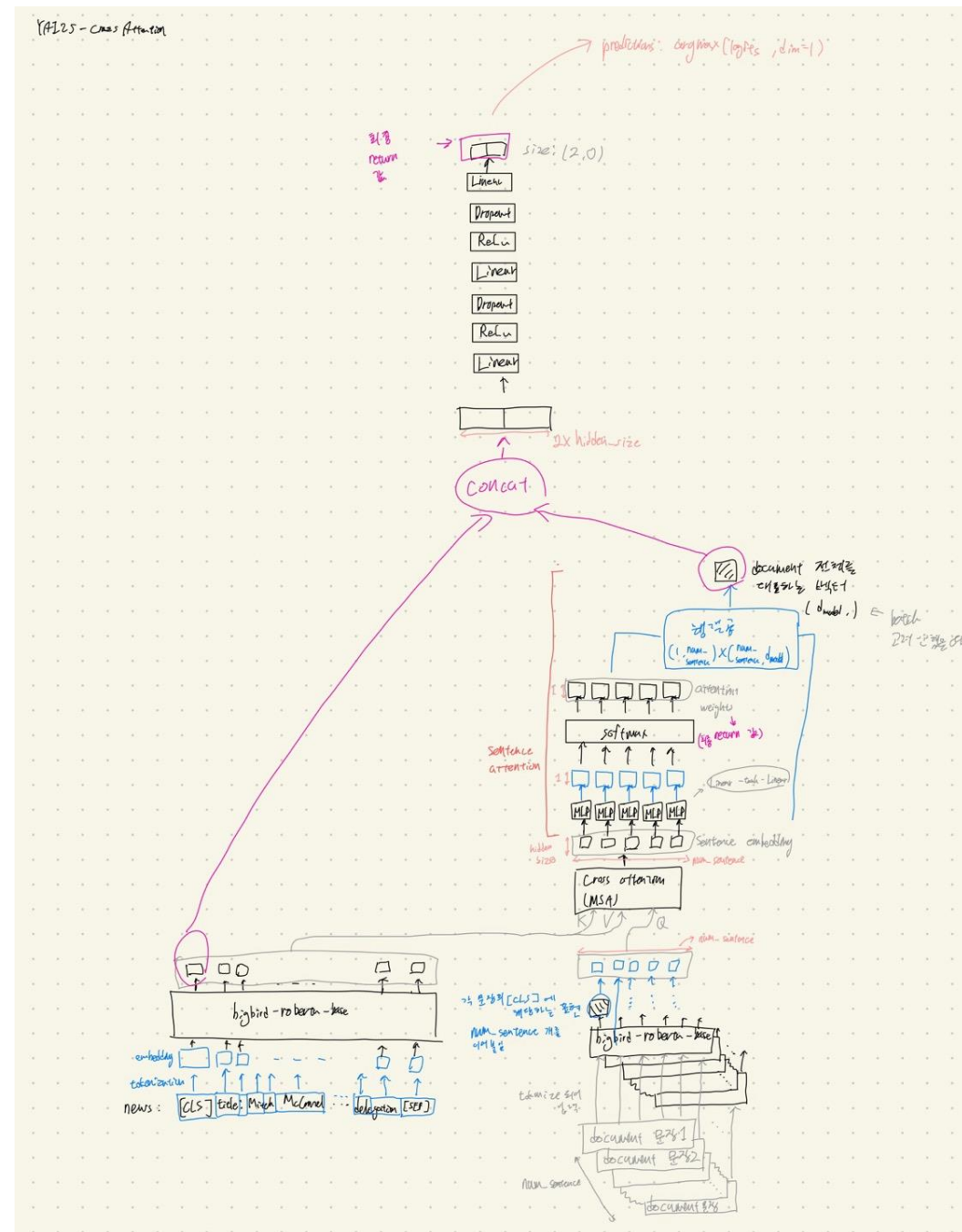
Appendix

Discussion: Bert의 input embedding 제한

- ➔ Bert 모델이 가지는 최대 입력 토큰 길이의 한계 - news를 전부 입력 받지 못함. 이를 위해 최대 입력 토큰 길이가 큰 모델에 대해서 학습함 (Longformer, BigBird)
- Longformer, BigBird 모델은 입력 토큰 길이 제한 문제를 해결하기 위해 가까운 토큰끼리만 정보를 공유하도록 하는 Sliding window 기법을 채택 (CNN의 filter_size와 stride 개념과 유사)
- 하지만 Sliding window는 주변 토큰간의 관계만 포함하여 가장자리 Context의 정보를 반영하지 못함 -> 뉴스가 두괄식이기 때문에 더 critical한 영향을 주게 됨.

Appendix

Fake Detect Model Architecture



Appendix

Fake Detect Model Cross-attention

```
Cross Attention Output: tensor([[[ 0.0844, -0.3101,  0.0440, ..., -0.3433, -0.1407, -0.1447],
[ 0.0896, -0.3066,  0.0452, ..., -0.3472, -0.1426, -0.1489],
[ 0.0856, -0.3137,  0.0411, ..., -0.3450, -0.1451, -0.1469],
...,
[ 0.0839, -0.3093,  0.0439, ..., -0.3430, -0.1400, -0.1449],
[ 0.0834, -0.3088,  0.0442, ..., -0.3457, -0.1387, -0.1470],
[ 0.0829, -0.3091,  0.0441, ..., -0.3428, -0.1450, -0.1490]]],
device='cuda:0', dtype=torch.float16, grad_fn=<SqueezeBackward1>)
```

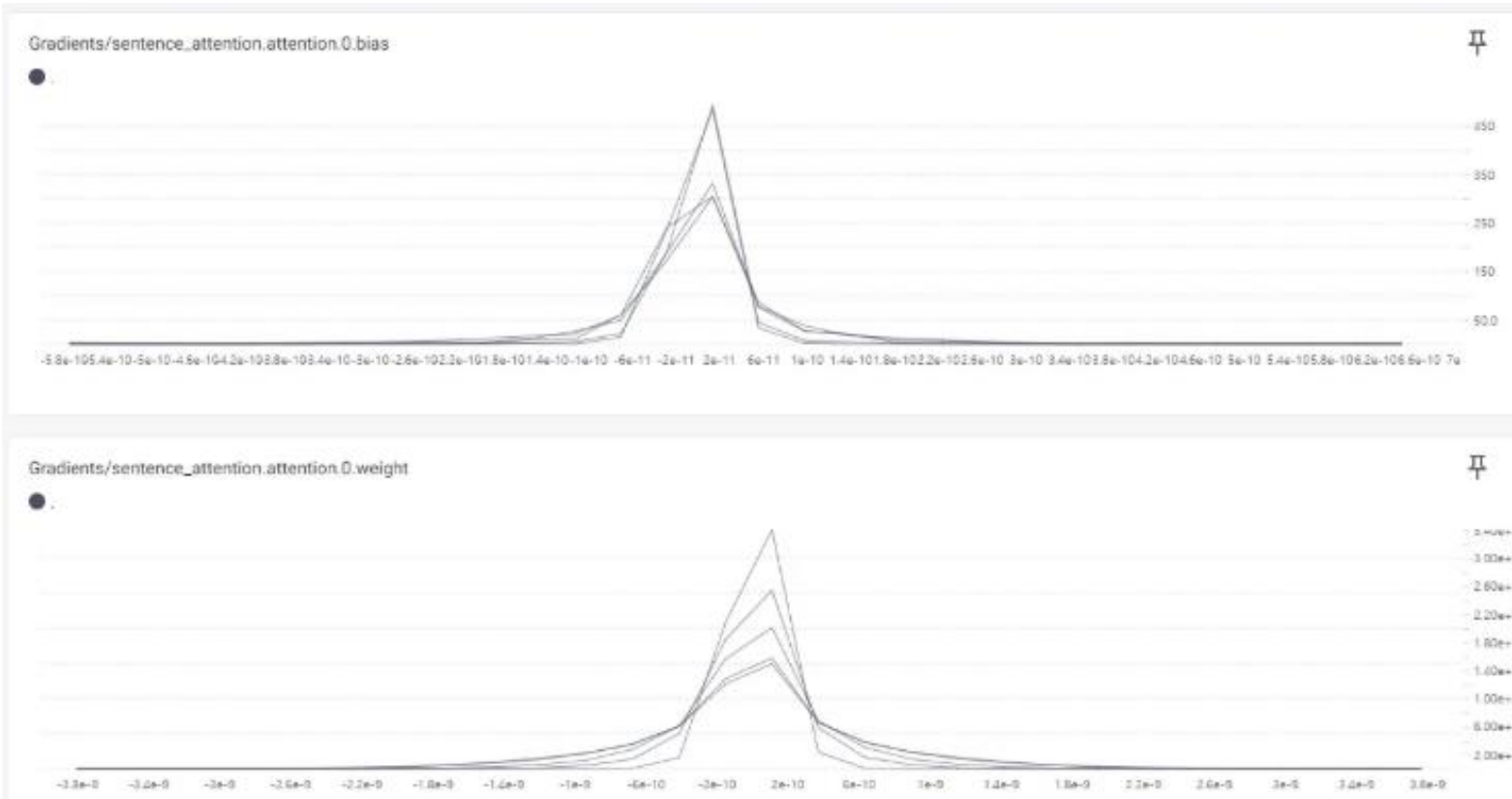
- Cross Attention output이 매우 비슷한 벡터들이 나옴.
- Evidence로 나온 문장들이 유사하여 cross-attention의 값이 비슷하게 나오는 것으로 추정 됨

```
Raw Attention Scores: tensor([[[[118.2500, 121.6250, 189.1250, ..., 100.0625, 117.6875, 308.0000],
[118.0000, 121.3125, 191.0000, ..., 100.4375, 118.0000, 307.5000],
[114.1875, 117.1250, 182.6250, ..., 96.5000, 113.5625, 297.2500],
...,
[134.3750, 139.1250, 218.6250, ..., 114.8125, 133.5000, 349.0000],
[114.0625, 118.1250, 183.3750, ..., 97.1875, 114.1875, 297.0000],
[113.0625, 116.9375, 183.3750, ..., 97.1875, 114.1250, 294.7500]]]],
device='cuda:0', dtype=torch.float16, grad_fn=<UnsafeViewBackward0>)
Attention Weights: tensor([[[[0.0020, 0.0020, 0.0029, ..., 0.0018, 0.0020, 0.0052],
[0.0020, 0.0020, 0.0029, ..., 0.0018, 0.0020, 0.0052],
[0.0020, 0.0020, 0.0028, ..., 0.0018, 0.0020, 0.0051],
...,
[0.0020, 0.0020, 0.0030, ..., 0.0018, 0.0020, 0.0059],
[0.0020, 0.0020, 0.0028, ..., 0.0018, 0.0020, 0.0050],
[0.0020, 0.0020, 0.0028, ..., 0.0018, 0.0020, 0.0050]]]],
device='cuda:0', grad_fn=<SoftmaxBackward0>)
Final Attention Output: tensor([[[[-0.0271, -0.0010,  0.1580, ..., -0.3037, -0.0191,  0.0058],
[-0.0270, -0.0010,  0.1581, ..., -0.3037, -0.0190,  0.0056],
[-0.0270, -0.0009,  0.1577, ..., -0.3035, -0.0193,  0.0060],
...,
[-0.0273, -0.0018,  0.1595, ..., -0.3037, -0.0183,  0.0047],
[-0.0271, -0.0009,  0.1577, ..., -0.3032, -0.0191,  0.0059],
[-0.0271, -0.0010,  0.1576, ..., -0.3035, -0.0190,  0.0058]]]],
```

- Query, Key의 분포가 비슷해서 내적값도 유사한 분포를 갖게 되는 것으로 추정.
- 따라서 attention_weights가 매우 작은 숫자로 나옴 + 비슷한 분포로 나옴

Appendix

Fake Detect Model Gradient



- Cross attention의 출력이 유사하여 Sentence attention 레이어가 학습이 되지 않는 것을 관찰 가능.

Appendix

Fake Detect Model Execution Time

- 1 batch(batch size = 1) 당 평균 7초정도의 실행 시간이 걸림

```
Execution time: 1 min 18.39 sec
Average execution time over 11 runs: 0 min 7.13 sec
Execution time: 1 min 25.51 sec
Average execution time over 12 runs: 0 min 7.13 sec
Execution time: 1 min 32.43 sec
Average execution time over 13 runs: 0 min 7.11 sec
Execution time: 1 min 39.51 sec
Average execution time over 14 runs: 0 min 7.11 sec
Execution time: 1 min 46.43 sec
Average execution time over 15 runs: 0 min 7.10 sec
Execution time: 1 min 53.62 sec
Average execution time over 16 runs: 0 min 7.10 sec
Execution time: 2 min 0.49 sec
Average execution time over 17 runs: 0 min 7.09 sec
Execution time: 2 min 7.32 sec
Average execution time over 18 runs: 0 min 7.07 sec
Execution time: 2 min 14.49 sec
Average execution time over 19 runs: 0 min 7.08 sec
Execution time: 2 min 21.38 sec
Average execution time over 20 runs: 0 min 7.07 sec
Step 20/208
Execution time: 2 min 28.43 sec
Average execution time over 21 runs: 0 min 7.07 sec
Execution time: 2 min 35.40 sec
Average execution time over 22 runs: 0 min 7.06 sec
Execution time: 2 min 42.31 sec
Average execution time over 23 runs: 0 min 7.06 sec
Execution time: 2 min 49.16 sec
Average execution time over 24 runs: 0 min 7.05 sec
```

Appendix

단일 BERT 모델

단일 RoBERTa만 사용하였을 경우, 오른쪽의 사진과 같이 뉴스 본문만 이용하여 판별하고, 추가적으로 주어진 evidence 문장을 활용하는것은 찾기 어려웠다.

11th layer top 50 tokens:

First input

a donald trump rally in virginia was repeatedly disrupted on Monday by protesters, including some from the black lives matter movement, in a stark display of the divisions the republican front-runners presidential campaign has long been accused of sowing. a **live broadcast** of a photographer trying to document the exit of dozens of black protesters from the rally in **southeastern railroad**, virginia, was grabbed by the neck and shoved to the ground by a u.s. secret service agent. hecklers disrupted the rally on a day when the **red rock billionaire** fended off criticism that he had not clearly condemned white supremacist support during an interview on cnn on sunday. **trump** taunted the protesters, shouting are you from **mexico**? at one of them. **supporters** in the audience confronted the hecklers in angry, face-to-face exchanges. as black protesters were escorted from the rally, the crowd around them began to chant, all lives matter. **trump** waited for the scene to quiet down before saying, folks, you are going to hear it once: all lives matter. the crowd roared with applause. black lives matter is a civil rights movement that sprang from police shootings of black americans in recent years. the trump rally took place on the eve of **super tuesday**, the biggest voting day in the race to pick the 2016 presidential nominees for the november election. a number of southern states including virginia are holding contests on tuesday, and opinion polls show **trump** is likely to consolidate his status as favorite to win the republican nomination. it was unclear whether **trump** would be damaged by support from white supremacists. he has risen in opinion polls and won three of four early nominating contests while proposing a temporary ban on muslims entering the country, calling muslim immigrants criminals and insulting women. his rivals for the republican nomination, **senator** **marco rubio**, urged him to ask the **new york times** to release a recording of his recent interview with its editorial board, following a report he told it he was not serious about his immigration proposals. on monday, the protesters disrupted trump's remarks several times for **john stewart**, promising him to shout to security guards several times, get the **hell** please, get them out. trump appeared to relish the discord, saying after the turmoil in the crowd that his rallies were more exciting than those of the other candidates: but it is fun, and exciting. at a rally last week in nevada, trump also jumped into the fray with a protester when he said, i'd like to punch him in the face. live photographer chris morris was on the fringe of an enclosed media section when he was seized by an agent from the secret service, which has the job of protecting the u.s. president and some white house candidates. i stepped 18 inches out of the (press) pen and then he grabbed me by the neck and started choking me and then he slammed me to the ground, morris told cnn at the scene. the trump campaign said it was not aware of the details of the incident and directed inquiries to local law enforcement. secret service spokesman robert hoback said the agency was aware of the incident involving one of its employees but it still working to determine the exact circumstances that led up to this incident. earlier on monday, trump's rivals criticized him for equivocating on white supremacist support when he was asked repeatedly on cnn if he would condemn the klan and disavow support from white supremacists, including david duke, a former klan grand wizard from louisiana. trump said that he had been hampered by a faulty earpiece during the cnn interview. duke on monday denied that he had endorsed trump. but he said he planned to vote for him and had advised his friends to do so too because of the candidates views on immigration and world peace. duke told fox news radio he disapproved of trump's lip service in support of israel, but i told my people to vote for him in the election for strategic reasons. he said he had not been part of the ku klux klan for nearly 40 years. on the democratic side, front-runner hillary clinton alluded to the country's divisions on monday after a landslide victory on saturday in south carolina's primary shifted her attention from party rival bernie sanders to the candidate she may end up facing in november. i don't think america ever stopped being great, she told supporters in massachusetts, adding a twist to trump's make america great again slogan. what we need to do now is make america whole. (additional reporting by amanda becker, susan heavy, megan cassella and eric walsh; writing by doina chiacu; editing by jonathan oatis, frances kerrey and cynthia costerman) this article was funded in part by asp. it was independently created by the reuters editorial staff. asp had no editorial involvement in its creation or production.

Second input

A Donald Trump rally in Virginia was repeatedly disrupted on Monday by protesters, including some from the Black Lives Matter movement. Live photographer Chris Morris was on the fringe of an enclosed media section when he was seized by an agent from the Secret Service. Trump appeared to relish the discord, saying after the turmoil in the crowd that his rallies were more exciting than those of the other candidates. Earlier on Monday, Trump's rivals criticized him for equivocating on white supremacist support when he was asked repeatedly on CNN if he would condemn the Klan and disavow support from white supremacists, including David Duke.

11th layer top 50 tokens:

First input

washingtonseoul saddle tough job american diplomacy **chief** u.s. negotiator north korea **is** u.s. president insist want talk enemy show interest **listen** veteran state department asia hand joseph yun might washington best diplomatic hope reduce risk devastate war korean peninsula serve administration rise **division** **hand** pyongyang **side** north korea young leader kim jong un show little interest negotiate either least develop nuclear-tipped missile cap able **is** u.s. **restrain** **despite** doubt **obstacles** south korean-born yun **will** colleagues other a hop diplomatic efforts **low** temperature dangerous nuclear stand-off accord reuters interview down current former u.s. **officials** south korean diplomats deeply skeptical chance draw amer white house official say note sarcasm think go anywhere **say** another u.s. **official** alt though suggest still worthwhile keep engage **have** north koreans long yun appear **understand** president donald trump public rejection direct negotiations **trump** **will** aid military threats drive north korea capitulate ruin nuclear missile program **four** white house officials say view **there** **even** u.s. intelligence agencies yun however quietly pursue direct diplomacy north korean officials **unite** **believe** mandate discuss issue beyond release u.s. citizens senior state department official tell reuters week june secure release u.s. student otto warmbier return **until** state come days **left** trump head asia friday senior aide warn world run time north korea crisis behind scenes yun try keep **own** fragile line communication could use prevent miscalculation one side spiral military conflict aggravate tensions **has** u.s. strategic bombers conduct drill south korea thursday follow word south korea spy agency north korea may prepare another missile launch u.s. officials say **privately** intercept test missile among options consideration though disagreement within administration risk **blind** yun soft-spoken 32-year foreign service **talents** take job year ago near end obama administration grapple trump strident rhetoric well disagreement **even** president **can** aid **whether** saber-rattling **force** kim capitulate threshold military action accord several u.s. officials speak condition anonymity concern yun difficulties surface seoul visit **regularly** **trump** travel next week second stop asian tour several south korean officials express worry yun diplomatic efforts **north** korea **has** real **underpin** **support** white house things clearly easy one south korean diplomat say yun precisely person talk north korea trump kill whole process **secretary** state rex tillerson tell reporters sept. 28 **until** **state** probe diplomatic open slap trump tell via twitter waste time **time** cia director mike pompeo regularly brief trump intelligence matter consider one hawkish voice north korea president inner circle apparently gain stature several officials familiar discussions say pompeo feed trump assessments u.s. military threats force kim bow u.s. demand nuclear disarmament position u.s. intelligence officer privately contest cia decline comment u.s. official speak condition anonymity say yun become diplomatically untethered fully connect core u.s. approach emphasize economic sanction threat military action rather diplomacy one tangible achievement yun diplomatic efforts past year win release 22-year-old warbier secret talk north korean officials oslo new york yun fly pyongyang june medically evacuate warbier choe son hui head north korean foreign ministry north america bureau meet yun oslo unaware serious warbier condition source washington knowledgeable matter say learn shock yun summon urgently meet north korean diplomat new york quickly lead warbier return home source say warbier death complicate yun efforts contribute chill u.s.-north korean contact around time state department official say despite trump threats military action pyongyang state department official say yun view less engage diplomatically likely dark even trump rhetoric raise question among ally possibly even north korea serious administration diplomacy much mandate yun may pursue trump personalize conflict deride kim little rocket man advice national security intelligence experts warn could counterproductive senior national security official say another official point however trump may say would honor meet kim hurl fresh insult kim recent days raise hop alter approach south korean official say yun necessary washington someone contact north korea help spur future negotiations ever take hold trump national security adviser h.r. mcmaster tell japan nbc television week effort enter long drawn-out negotiations allow north korea use negotiations cover continue nuclear missile program former u.s. negotiators sympathize yun whose authority negotiate undercut top-of-war white house breathe fire state department push peaceful solution nobody doubt authority say wendy sherman one lead u.s. negotiators achieve 2015 deal iran agree restrain nuclear program return relief economic sanction undermine ability job robert gallucci chief u.s. negotiator north korean nuclear crisis is 1994 recent contact yun say envoy realistic challenge negotiate current atmosphere include tone set president believe mission even approach guide realize he a dreamer skepticism dog u.s. envoy a north korean peace efforts

Second input

Joseph Yun is a former U.S. Special Representative for North Korea Policy. Yun's diplomatic efforts led to the release of Otto Warmbier from North Korea. Warmbier was imprisoned in North Korea in 2016 and was released in a vegetative state in June 2017.