



A Simple Contrastive Learning Framework for Interactive Argument Pair Identification via Argument-Context Extraction

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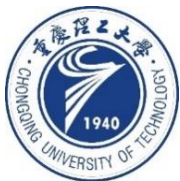
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Code: https://github.com/shilida/CL_Interactive_Argument_Pair_Identification

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Reported by Renhui Luo

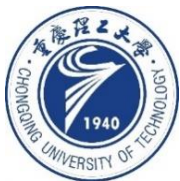


1.Introduction

2.Overview

3.Methods

4.Experiments





Introduction

the us military is taking justice into its own hands by conducting extrajudicial killings of terrorists. **yes they have committed horrendous crimes against the united states and killed scores of innocent people but they deserve to be given justice in us courts or tried in their own countries just like anyone else.** the us military cannot serve as judge, jury and executioner. it is the right way to send a message about the world that the united states wo not stoop down to vigilantism to right wrongs committed against us. with religion motivating these terrorists the death of others does not scare them, they become martyrs. the increased use of **drones** for these operations has only made the situation worst by killing innocent civilians and children in the crossfire and it serves only to enrage terrorists more take what happened in the recent peshawar attack URL now please try to cmv.

Quotation and its context

well, they are not us citizens, so they really do not deserve justice in our court system. also, many are not even citizens of the country they are hiding in. for those that are citizens of the country, for the most part there is a general allowance by the host nation for the us to do what it is doing. when we ask a nation if we can drop a bomb to kill some asshole, and they say go right ahead ! we hate that fucker too ! what law is being broken ? highly debatable that this is vigilantism, there is a lot of political work involved to get these things done. your notion that we are just storming around the globe raining death, while poetic, is far from the reality of the situation. where every operation needs to be approved, and very often the united states is working hand in hand with the host nation to orchestrate these strikes.

...

Positive reply and its context

as we are functionally at war with al Qaeda and military courts do not have juries, merely a panel of higher ranking officers, i believe that we could forgo the jury. however with a jury would that make it ethical ? additionally a military intervention to capture the suspect could also lead to collateral damage. the alternative to **a drone strike** is not merely a trial but a team being sent in to capture the suspect as well. i believe that is equally if not more likely to cause unintended casualties. i will try to find statistics on that but currently do not have any in front of me.

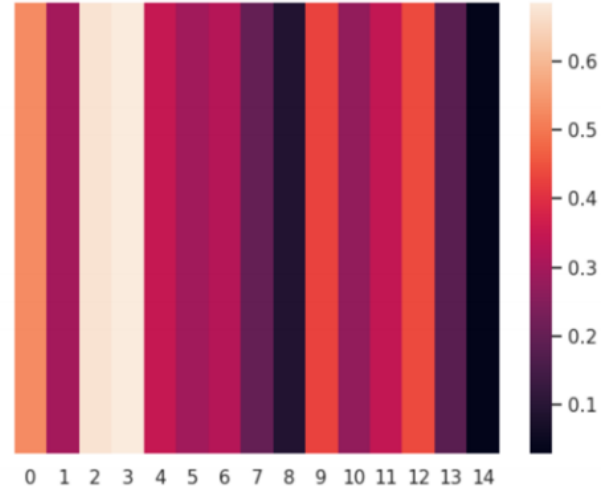
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Negative reply1 and its context

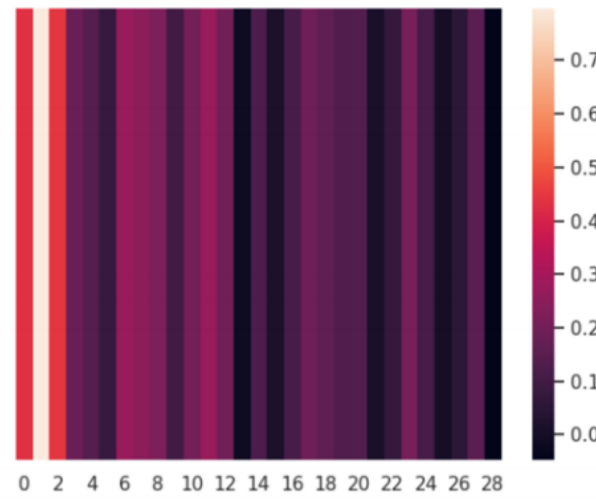
here you go URL the part you are after is on page 0. the bureau of investigative journalism estimates that civilian deaths from **drone strikes** in pakistan fell to 0 percent of total deaths in 0 and to less than 0 percent in 0. sometimes ground assaults go smoothly. take the one that killed osama bin laden. **it was executed by the best trained, most experienced soldiers in the world.** killed were bin laden; his adult son khalid; his primary protectors, the brothers abu ahmed al kuwaiti and abrar al kuwaiti; and abrar is wife bushra. assuming bushra qualifies as a civilian, even though she was helping to shelter the world is most notorious terrorist, civilian deaths in the raid amounted to 0 percent of the casualties. in other words, even a near perfect special ops raid produced only a slight improvement over the worst estimates of those counting **drone casualties.** many assaults are not that clean.

Negative reply2 and its context

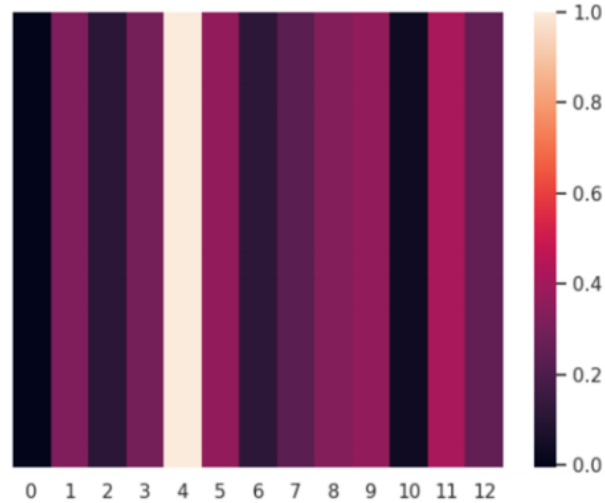
Introduction



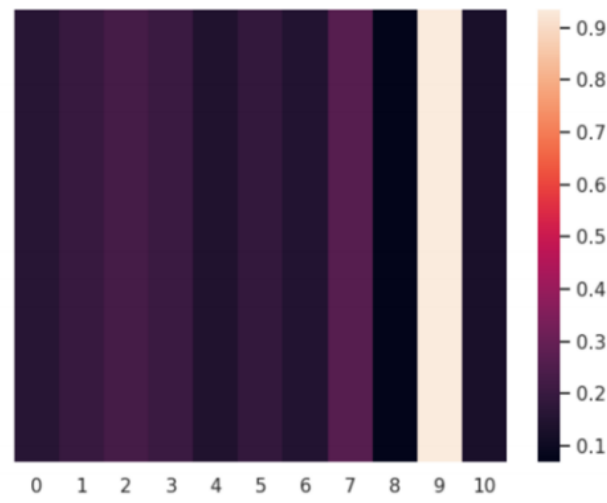
(a)



(b)

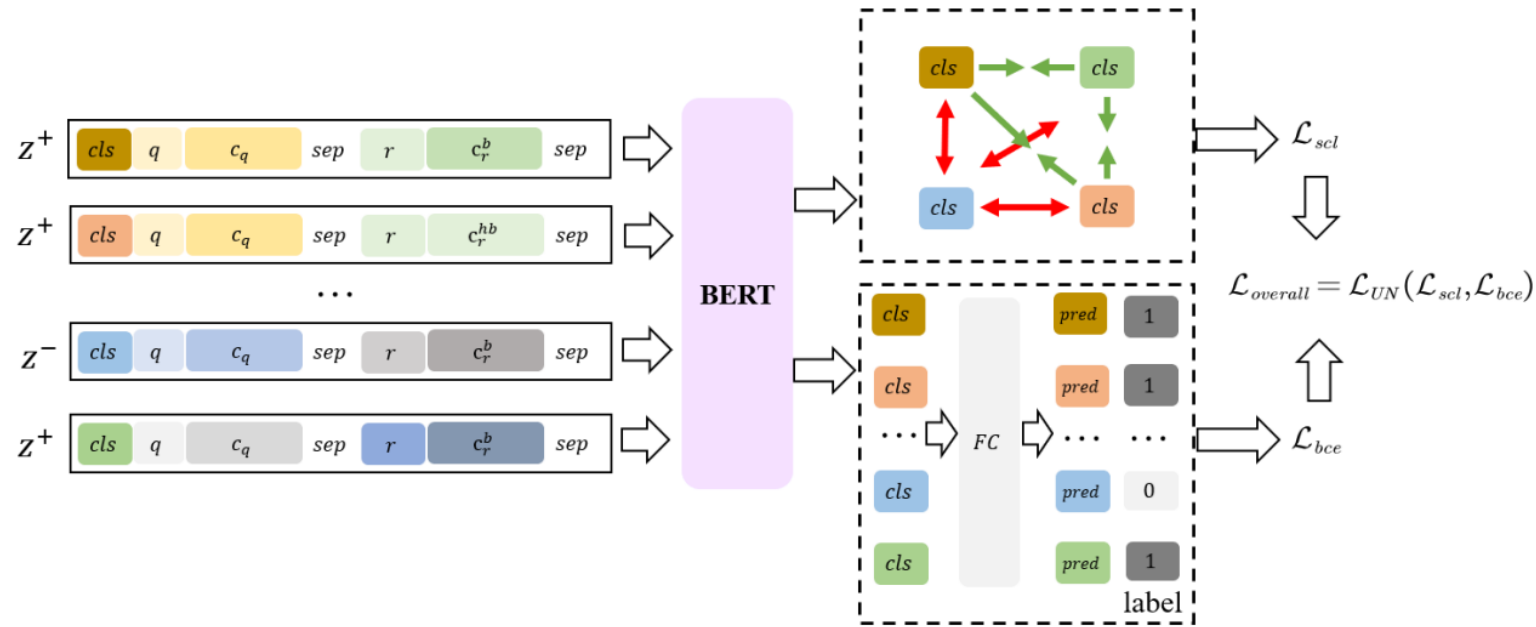
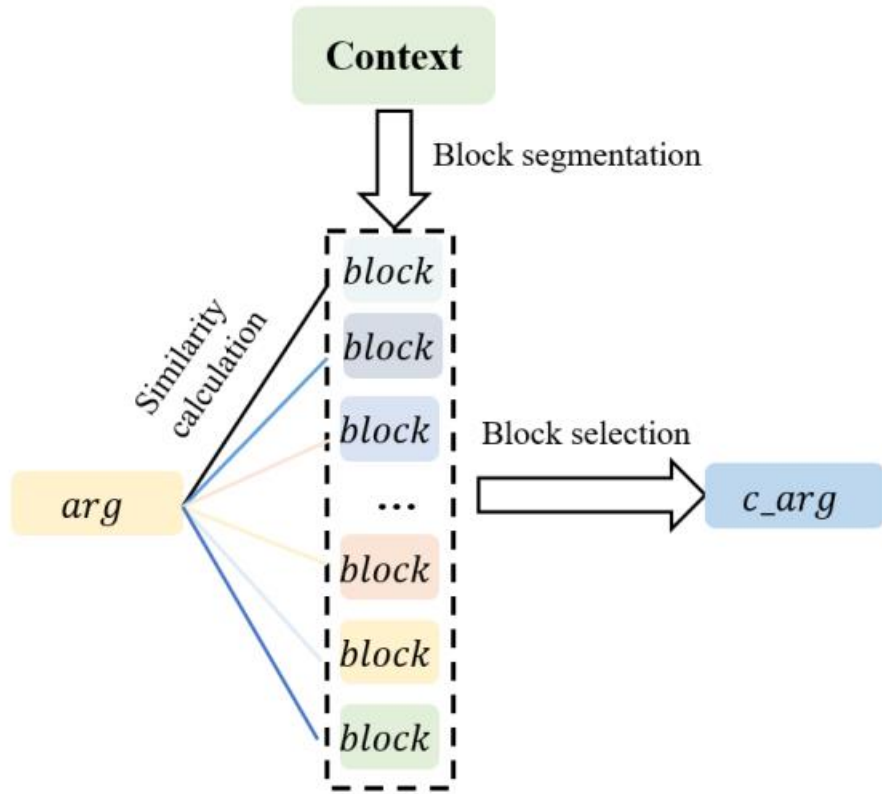


(c)

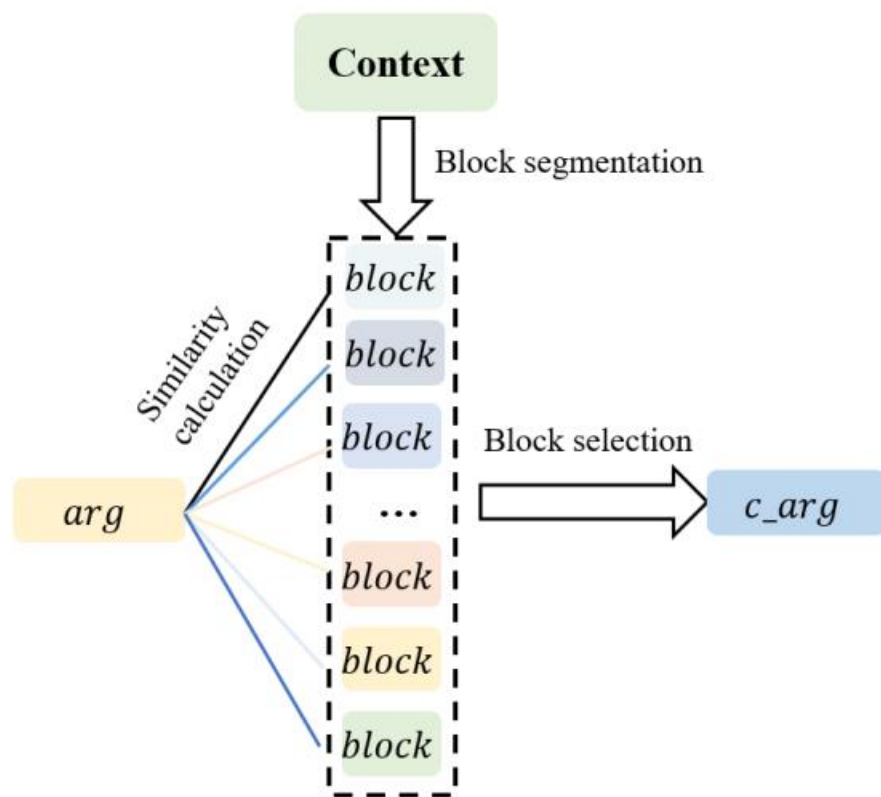


(d)

Overview



Method



$$Sim(arg, c_{arg}) = \begin{bmatrix} sim(h_{arg}, h_{block1}) \\ sim(h_{arg}, h_{block2}) \\ \dots \\ sim(h_{arg}, h_{blockN-1}) \\ sim(h_{arg}, h_{blockN}) \end{bmatrix} \quad (1)$$

$$h = BERT_{\theta}(x)$$

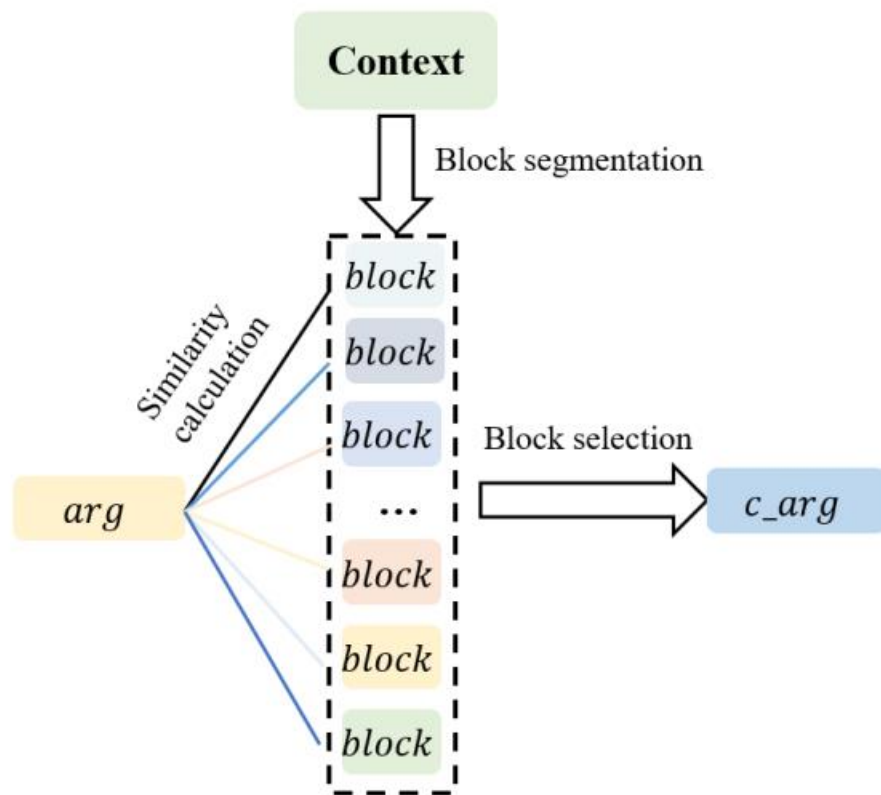
$$c_q^b = c_q^{b1}, c_q^{b2}, \dots, c_q^{bn} \quad (2)$$

$$c_r^b = c_r^{b1}, c_r^{b2}, \dots, c_r^{bn} \quad (3)$$

$$z = [CLS] q, c_q^b [SEP] r, c_r^b [SEP] \quad (4)$$

$$3 + L(q) + \sum_{i=1}^n L(c_q^{bi}) + L(r) + \sum_{i=1}^n L(c_r^{bi}) \leq 512 \quad (5)$$

Method

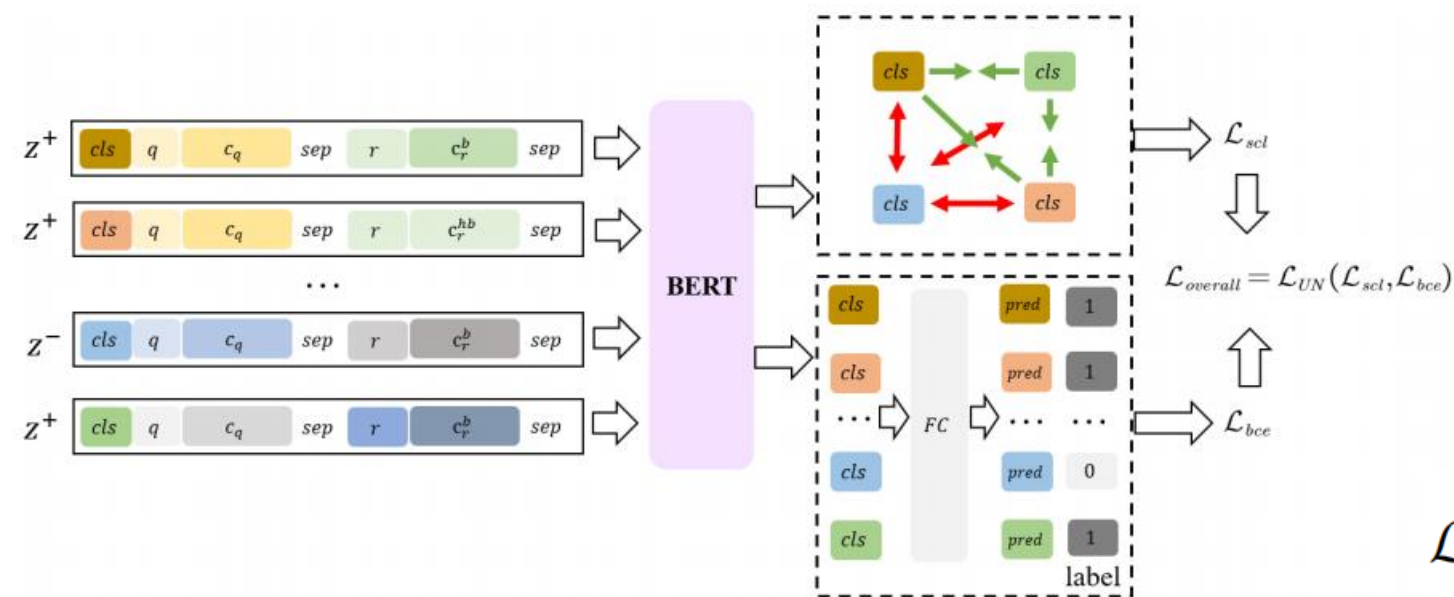


$$z_{hard} = [CLS] q, c_q^b [SEP] r, c_r^{hb} [SEP] \quad (6)$$

$$c_r^{hb} = c_r^{b1}, c_r^{b2}, \dots, c_r^{bm} \quad (7)$$

$$c_q^b = c_q^{b1}, c_q^{b2}, \dots, c_q^{bn} \quad (8)$$

Method



$$\mathcal{L}_{bce} = -\frac{1}{N} \sum_{i=1}^N y_i \log \hat{y}_i + (1 - y_i) \log (1 - \hat{y}_i) \quad (9)$$

$$\mathcal{L}_{scl} = -\frac{1}{N} \sum_{i=1}^N \frac{1}{N_{y_i} - 1} \sum_{j=1, i \neq j, y_i = y_j}^N \Phi \quad (10)$$

$$\Phi(h_i, h_j) = \log \frac{e^{\text{sim}(h_i, h_j)/\tau}}{\sum_{k=1, k \neq i}^N e^{\text{sim}(h_i, h_k)/\tau}} \quad (11)$$

$$\mathcal{L}_{UW}(\mathcal{L}_1, \mathcal{L}_2) = \frac{1}{2\sigma_1^2} \mathcal{L}_1 + \frac{1}{2\sigma_2^2} \mathcal{L}_2 + \log \sigma_1 \sigma_2 \quad (12)$$

$$\mathcal{L}_{overall} = \mathcal{L}_{UW}(\mathcal{L}_{bce}, \mathcal{L}_{scl}) \quad (13)$$



Experiments

Method	P@1(%)	MRR(%)
Random Guess	20	45.67
BiGRU	51.52	70.57
BiGRU+RNN Context	55.98	73.20
BiGRU+Hierarchical Context	57.46	73.72
VAE+Hierarchical Context	58.61	74.66
DVAE+Hierarchical Context	61.17	76.16
BERT	61.85	76.57
BERT+Hierarchical Context	66.85	78.51
BERT+Knowledge Graph+GCN+Context*	68.75	80.85
Ours	82.17	89.60



Experiments

Method	P@1(%)	MRR(%)
BERT-BCE(baseline)	63.54	77.82
+ ACE	75.35	85.34
+ CL	80.01	88.35
+ Hard	82.17	89.60



Experiments

Method	P@1(%)	MRR(%)
Without context	63.54	77.82
Low similarity	69.14	81.40
Random	73.60	84.15
High similarity(ours)	75.35	85.34



Experiments

Method	P@1(%)	MRR(%)
ACE	75.35	85.34
Hard without CL	80.62	88.75
Hard with CL	82.17	89.60

Table 4: Further experimental results on hard samples construction.



Experiments

Method	O	(a)	(b)	(c)
BCE	80.62	74.61	80.21	78.19
BCE+CL	82.17	76.10	81.17	78.53

Table 5: Results on noisy testing sets with varying kinds of noise. “O” denotes the original text. “(a),(b),(c)” denote the three kinds of noisy. We use P@1 as the metric.



Experiments

Noisy method	Text
Original text	i am willing to bet that john boehner would have an easier time dealing with congress as president than joe biden would due to his constant interaction with it.
Augmentation randomly	am willing that john have an easier time dealing with congress as president than joe would due his interaction it.
Simulate keyboard distance error	am !Jllijg rhaR john have an easier time vWalinb S7th dpnnress as president rhwn joe 1ouKd due his interaction it.

Table 6: An instance of constructing a noisy sample.

Experiments

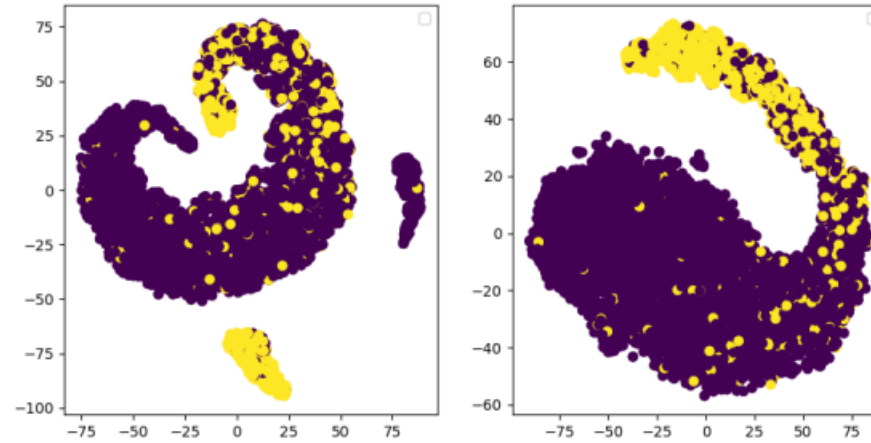


Figure 5: t-SNE plots of the learned CLS embeddings on the testing set. Left: BCE; Right: BCE+CL; Violet: negative examples; Yellow: positive examples.



Thanks!