

CARES: Cause Recognition for Emotion in Suicide notes

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Introduction

- ❖ Suicide continues to be one of the major causes of death across the world.
- ❖ **Emotion Cause Extraction (ECE)** in suicide notes may help comprehend suicide motives and mental state.

Contributions

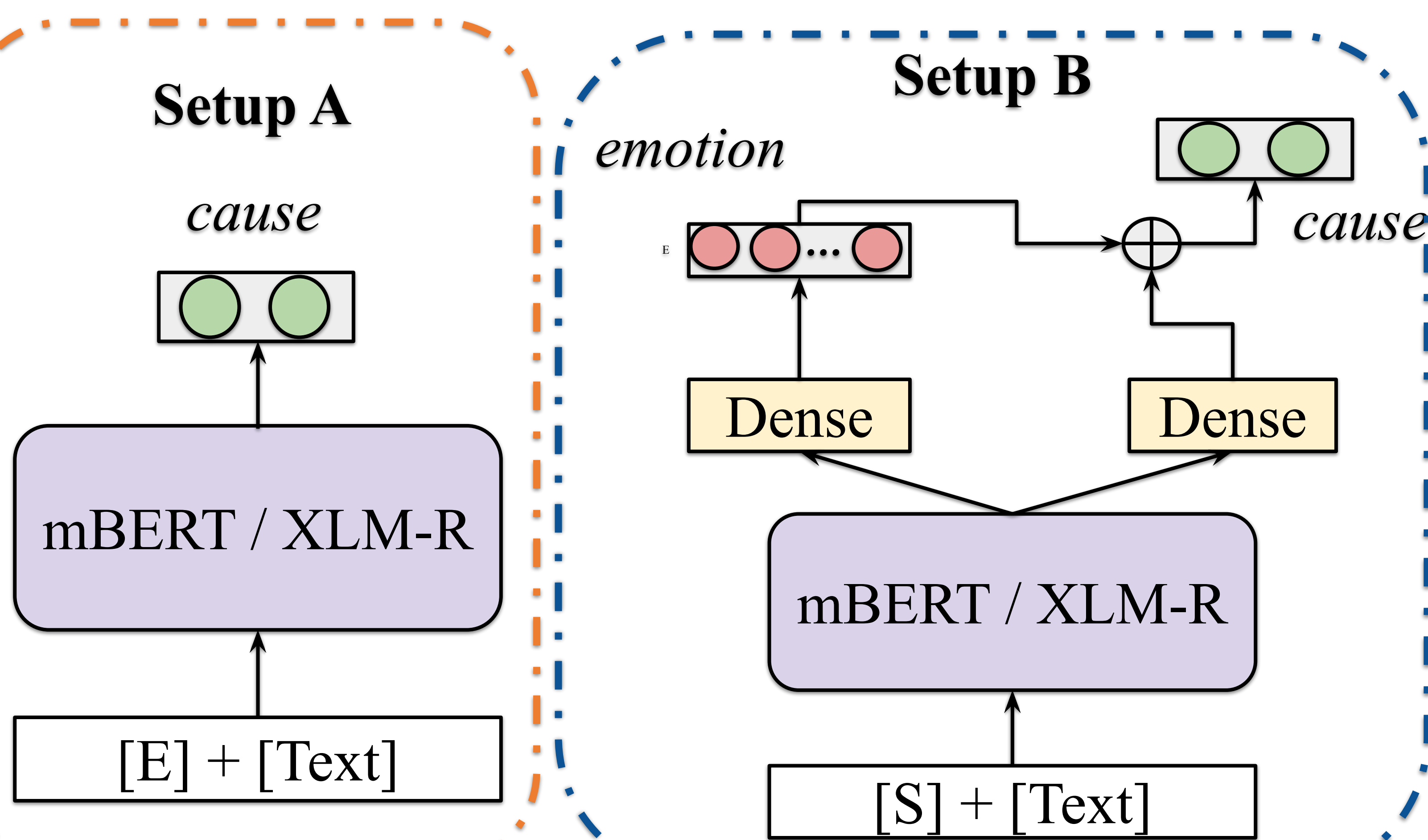
- ❖ Produced a gold standard corpus annotated with causal spans for emotion annotated sentences in suicide notes.
- ❖ Developed a benchmark setup for emotion cause recognition in suicide notes (sentence-level), specifically, *cause identification* and *cause extraction*.

Corpus Development

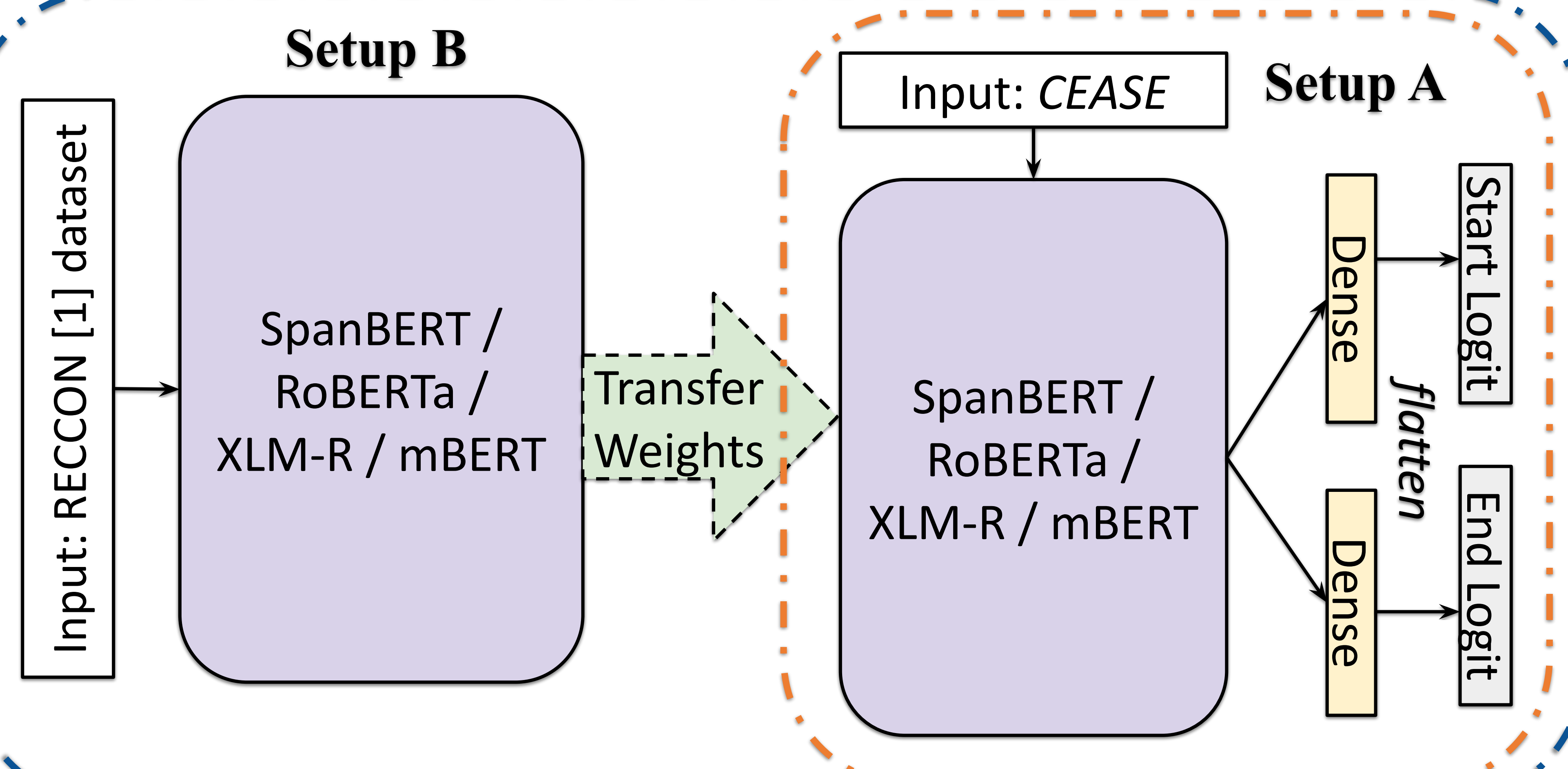
- ❖ We introduce, **CARES_CEASE-v2.0**, a multi-lingual (English, Bengali, Hindi, Telugu) emotion and cause annotated suicide corpus.
- ❖ English Suicide Notes: **~320 notes**
- ❖ Non-English Suicide Notes: **67 notes**
- ❖ Total sentences: **5769 sentences**

Methodology

Cause Identification



Cause Extraction



Results I - Cause Identification Task

- ❖ Learning the two tasks simultaneously increases performance relative to learning the tasks separately, regardless of the differences in pre-trained encoders.

Setup A	Cause Task		Setup B	Cause Task		Emotion Task	
	A (%)	F1 (%)		A (%)	F1 (%)	A (%)	F1 (%)
mBERT	81.73	80.41	mBERT	83.20	81.89	75.67	74.48
XLM-R	80.87	79.94	XLM-R	81.55	79.67	76.36	72.81

Results II - Cause Extraction Task

Setup A	FM (%)	PM (%)	HD	JS	ROS
SpanBERT	31.17	17.62	0.49	0.66	0.76
RoBERTa	28.73	19.51	0.42	0.58	0.69
XLM-R	31.98	23.58	0.45	0.64	0.74
mBERT	29.00	26.29	0.48	0.62	0.73

Evaluation Metrics

A: Accuracy
FM: Full Match
PM: Partial Match
HD: Hamming Distance
JS: Jaccard Similarity
ROS: Ratcliff-Obershelp Similarity

Setup B	FM (%)	PM (%)	HD	JS	ROS
SpanBERT	28.18	29.00	0.45	0.62	0.73
RoBERTa	34.42	23.04	0.49	0.67	0.76
XLM-R	35.23	21.41	0.52	0.66	0.76
mBERT	29.54	28.73	0.48	0.61	0.73

- ❖ The FM and PM metrics give a quantitative estimation of the model's performance.
- ❖ The HD, JS and ROS metrics give a qualitative estimation of the model's performance.
- ❖ The cross-lingual XLM-R model adapts well to our multilingual data as well as the cause extraction task.

Conclusion

- ❖ The proposed method performs commendably on the ECE task in suicide notes.
- ❖ We extended existing CEASE [2] corpus with multilingual data and emotion cause annotations.

References

- [1] Poria, Soujanya, et al. "Recognizing emotion cause in conversations." *Cognitive Computation* 13.5 (2021): 1317-1332.
- [2] Ghosh, Soumitra, Asif Ekbal, and Pushpak Bhattacharyya. "A multitask framework to detect depression, sentiment and multi-label emotion from suicide notes." *Cognitive Computation* 14.1 (2022): 110-129.

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