Textual Emotion-Cause Pair Extraction in Conversations

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Abstract

Dialogue is a vital aspect of human interactions that contains a significant number of emotions, making it intriguing to find their origins within conversations. In its organic state, dialogue encompasses various modes of expression, rendering it a complex and multifaceted form of communication. Importantly, conversations occur in a natural, multimodal manner, integrating various modes of expression for a comprehensive communication experience.

Introduction

Emotion plays a vital role in human conversations. Our task is to predict the cause of a particular emotion in the conversations. Conversation in a natural form is multimodal. Multimodal is especially for discovering both emotions and their cause. That is why two types of models are combined, which would predict the emotion of the utterance and the cause of the utterance.

Result

Task of the model	F1_score
Model 1: Does not have emotion	0.61
Model 1: Has emotion	0.73
Model 1: Is not a cause	0.69
Model 1: Is a cause	0.63
Model 2: Is not a valid emotion-cause pair	0.93
Model 2: Is a valid emotion-cause pair	0.40
Model 3: disgust	0.00
Model 3: joy	0.52
Model 3: surprise	0.41
Model 3: anger	0.37
Model 3: fear	0.00
Model 3: sadness	0.27
Model 4: Final span for emotion cause-pair	0.0268

Methodology

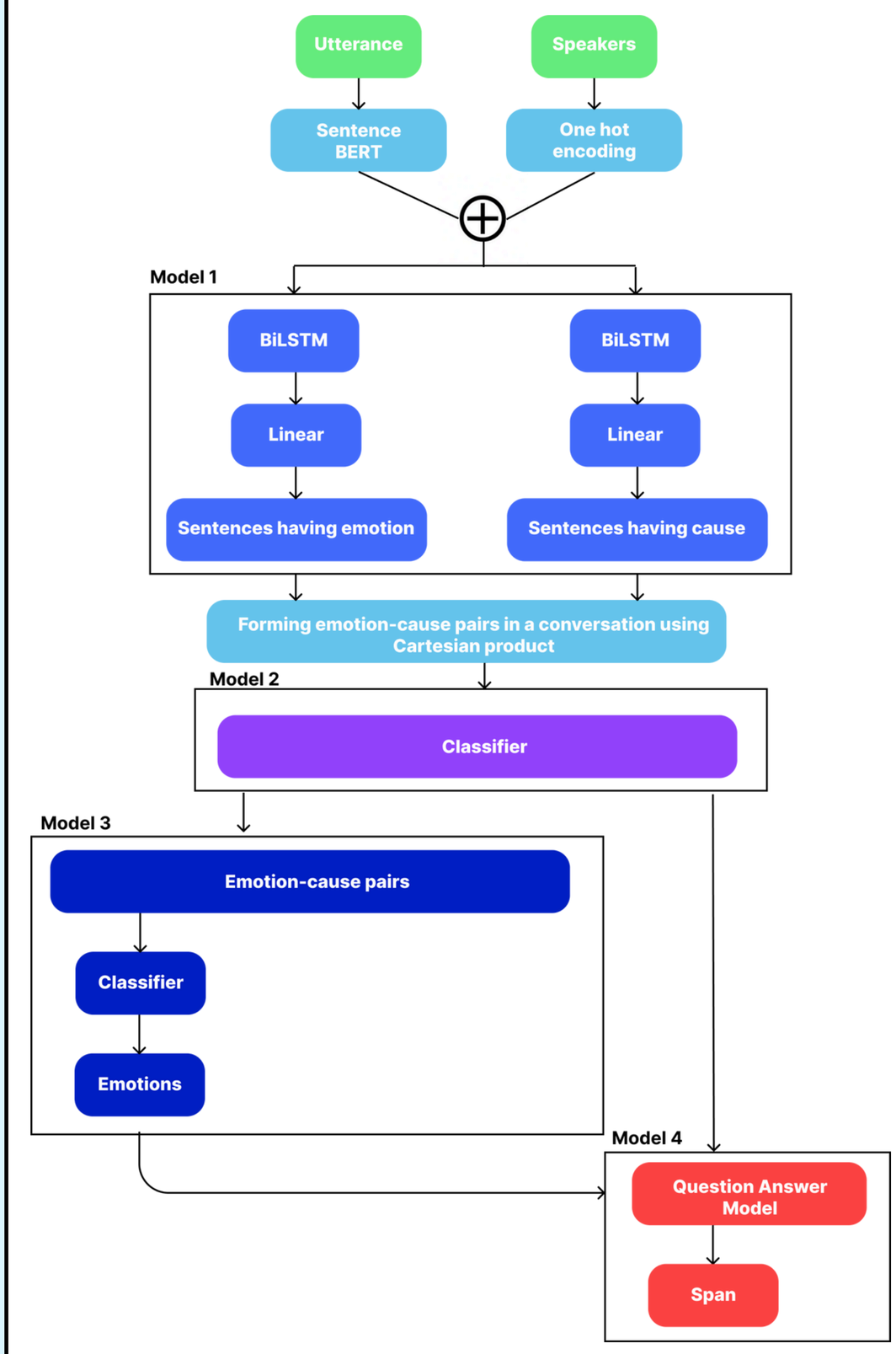
Model1: The purpose of this model is to find all potential emotion possessing and causal sentences of each conversation. For this task, we propose two BiLSTMs. One for emotion sentences extraction and other for cause sentences extraction.

Model2: This model utilizes the emotion and causal representations inferred from Model 1. The idea of this model is to recognise relationships between emotion representations and causal representations.

Model3: After getting valid emotion-cause pairs, we finally train another classifier that utilizes the emotion-cause pairs to predict the emotion involved in those pairs.

Model4: For the final part of the model, a pre-trained question-answer model is used. At this moment, the whole sentence is being predicted which is the cause of the target sentence.

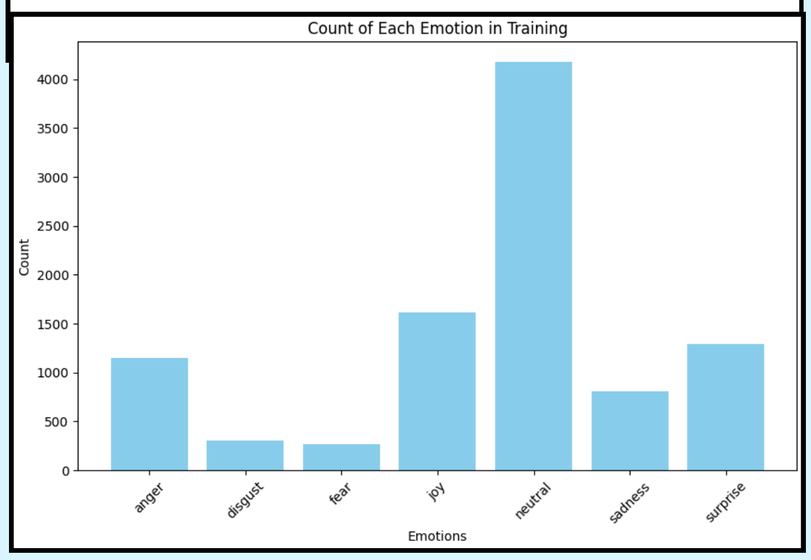
Model



Dataset

The dataset provided for Task 3 of SemEval-2024 involves **Emotion-Cause Pair Extraction**. It consists of 1,374 total conversations. Each conversation contains a series of sentences, with the maximum length of sentences in a conversation being 33. The number of classes of emotions is 7.

Each emotion-cause pair consists of an emotion and its corresponding cause within the conversation and 9,794 such emotion-cause pairs are shown. The dataset may contain future references which means that the cause of an emotion would come after the emotion. Also, some conversations may not contain any emotion-cause pairs.



Conclusion

We opted not to use emotions or predict emotions due to task definition. It is worth noting that ECPE is a challenging task as compared to ECE. Our model was built in order to work on sentences rather than clauses which gives worse performances because sentences contain multiple clauses. Moreover, our model performance is justified due to the fact that we train multiple models and these models have some dependencies on one other and therefore, errors of one model are propagated to the other.

Reference

- Wang, F., Ding, Z., Xia, R., Li, Z., & Yu, J. (2022). Multimodal emotion-cause pair extraction in conversations. *IEEE Transactions on Affective Computing*.
- Nguyen, H. H., & Nguyen, M. T. (2023). Emotion-cause pair extraction as question answering.