Table

Description automatically generated

Prod

Table

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Sum

Table

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Different from the two approaches above, which aimed at improving the system’s performance on the GoEmotion labeling. This approach is intended to improve the system performance on Ekman’s taxonomy. Authors in the GoEmotion paper(Demszkyet al., 2020) applied transfer learning by freezing all the parameters in BERT except for the last dense layer, and replacing the last dense layer and fine tuning it on the GoEmotion Dataset. Here, we wanted to propose a different approach. Each label in the Ekman’s taxonomy has it’s corresponding sublabels, for instance, anger maps to (anger, annoyance, disapproval). We here wanted to treat the sublabels as the attributes of the certain label. Then we wanted to combine the probabilities of a class’s attributes to calculate the score of the certain class ,and then we can use the score to determine whether it is has the certain emotion. There are several ways to accomplish this, we here list some options (still, take the anger as an example, \* indicates that it is a subclass).

Text

Description automatically generated with medium confidence

In our experiment, we’ve tried product and the summing approaches. From the result, it shows that our approaches lead to a higher precision but lower recall compared to the Google’s approaches. It might due to that, after neural network, the neural network may not be able to distinguish these subgroups. For instance, in the model’s decision process, some sub labels of anger may have some impact on the score of the neutral one. Thus, we wanted to use Probabilistic Linear Discriminant Analysis (PLDA) to shrink the distance between samples with same label and enlarge the distance between samples with different labels.

GoEmotions dataset is composed of 58K Reddit comments with 28 classes, which contains 27 emotions and the class neutral. Besides, every example in GoEmotions is labeled by multiple annotators for quality assurance. Three annotators are assigned to every sample, if no annotators agree on one sample, two more annotators will be assigned. At the same time, multi-label is allowed for the same sample as long as annotators are confident about the emotions labeled.

Since GoEmotions is the largest human labeled dataset with comparatively richer emotion categories, we select GoEmotion as the dataset for our project.