

論文内容要旨

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学位論文題目	Research on Emotional Text Generation and Multi-label Textual Emotion Detection (感情テキスト生成とマルチラベルテキスト感情検出に関する研究)		
<p>内容要旨</p> <p>Machines with emotions can give us a better human-computer interaction experience. The expression and detection of emotions are two important aspects of machines with emotions. This paper is devoted to exploring machine generation of text with emotion and detection of all emotions contained in the text.</p> <p>So far, most of the mature dialogue systems are task-oriented based, while non-task-oriented dialogue systems still have a lot of room for improvement. We propose a data-driven non-task-oriented dialogue generator CERG based on neural networks. This model has the emotion recognition capability and can generate corresponding responses. We try to concatenate the post and the response with the emotion, then mask the response part of the input text character by character to emulate the encoder-decoder framework. We introduce retrieval methods in the inference process. We calculate the weight scores of similar posts and responses together with beam search, which can make the predicted responses more in line with the context.</p> <p>The data we adopt comes from the NTCIR-14 STC-3 CECG subtask. The coherence, fluency, and emotional relevance scores of our model in the manual evaluation are higher than the model without the retrieval method and the baseline model. The proportion of safe and commonplace responses has also been greatly reduced. The results of the manual evaluation show that our proposed model can make different responses to different emotions to improve the human-computer interaction experience.</p> <p>Textual emotion detection is also playing an important role in the human-computer interaction domain. Current methods of textual emotion recognition mainly use large-scale pre-trained models fine-tuning. However, these methods are not accurate enough in the semantic representation of sentences. Contrastive learning has been shown to optimize the representation of vectors in the feature space. Therefore, we introduce the contrastive strategies to the textual emotion recognition task. The prompting method has been shown to make the language models more purposeful in prediction by filling the cloze or prefix prompts defined. Therefore, we design a prompting approach for multi-label classification. To stabilize the output, we design two consistency training strategies. Neural networks are prone to overfitting during training because of the small amount of emotion detection data. Based on experience or knowledge, symbolic approaches can fit a small amount of data by low-dimensional features and also outperform neural networks in terms of interpretability. We design three models combining symbolic approaches with neural networks for detecting all potential emotions from texts in this article.</p> <p>We experiment with the effectiveness of the strategies on two multi-label emotion classification datasets: Ren-CECps and NLPCC2018. The experimental results demonstrate that using the contrastive strategy in the classification part is more effective in improving the accuracy of emotion recognition than using the contrastive strategy in the encoding part. Our proposed prompt tuning with consistency training for multi-label textual emotion detection model achieves Macro F1 scores of 0.5432 and 0.5269, respectively. The experimental results show that the symbolic approaches improve the fitting process, improve the interpretability and increase the accuracy of neural networks. This indicates that neurosymbolic methods are effective in the multi-label textual emotion detection task.</p>			