基於 Transformer 及遞歸神經網路的自然語言情感分析方法

摘要

情感分析在社會議題的預測和回應扮演一個非常重要的角色，尤其針對疾病和種族歧視的爆發。為了分析某個議題的公共情感，遞歸神經網路(Recurrent Recurrent Neural Network, RNN)和 Transformer 被考慮。鑒於文本中短期依賴和長期依賴可以提供不同的好處，我們的模型擬使用 Bidirectional Encoder Representation from Transformers (BERT)當作 Transformer 的編碼器，同時使用 Single-Headed Attention RNN (SHA-RNN)當解碼器。相較於原始的 Transformer 和 SHA-RNN，我們所提出的新模型不僅擁有原始 Transformer 的長期依賴特性，亦能符合短期依賴的需求。因此，這個新模型可以提供更準確的情感分析供疾病追蹤與預防參考，以及供各種言論的判斷。

A Sentiment Analysis Method based on a Transformer and a Recurrent Neural Network

Abstract

A sentiment analysis plays a very important role in the prediction and response of social issues, especially for an outburst of disease and racism. In order to analyze

public sentiment on certain issue, a Recurrent Neural Network (RNN) and a Transformer are considered. Given that short-term dependencies and long-term dependencies of text can provide different benefits, our model is implemented through a Transformer with Bidirectional Encoder Representation from Transformers (BERT) as its encoder and with Single-Headed Attention RNN (SHA-RNN) as its decoder. Compared with the original Transformer and SHA-RNN, our proposed new model not only possesses the long-term dependence characteristics of the original Transformer, and it can also meet the short-term dependence requirements. Therefore, the new model can provide more accurate sentiment analysis for reference of disease tracking and prevention as well as for judgement of various remarks.