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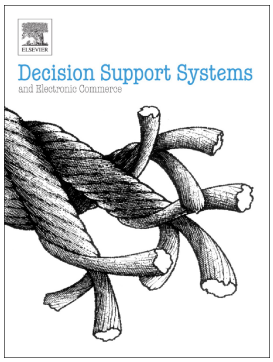

Deep learning for affective computing: text-based emotion recognition in decision support

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Deep learning for affective computing: text-based emotion recognition in decision support

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Abstract

Emotions widely affect human decision-making. This fact is taken into account by affective computing with the goal of tailoring decision support to the emotional states of individuals. However, the accurate recognition of emotions within narrative documents presents a challenging undertaking due to the complexity and ambiguity of language. Performance improvements can be achieved through deep learning; yet, as demonstrated in this paper, the specific nature of this task requires the customization of recurrent neural networks with regard to bidirectional processing, dropout layers as a means of regularization, and weighted loss functions. In addition, we propose *sent2affect*, a tailored form of transfer learning for affective computing: here the network is pre-trained for a different task (i.e. sentiment analysis), while the output layer is subsequently tuned to the task of emotion recognition. The resulting performance is evaluated in a holistic setting across 6 benchmark datasets, where we find that both recurrent neural networks and transfer learning consistently outperform traditional machine learning. Altogether, the findings have considerable implications for the use of affective computing.

Keywords: Affective computing, Emotion recognition, Deep learning, Natural language processing, Text mining, Transfer learning

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