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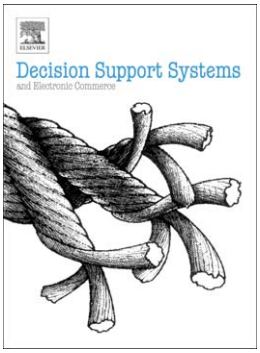

Decision support from financial disclosures with deep neural networks and transfer learning

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Decision support from financial disclosures with deep neural networks and transfer learning

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Abstract

Company disclosures greatly aid in the process of financial decision-making; therefore, they are consulted by financial investors and automated traders before exercising ownership in stocks. While humans are usually able to correctly interpret the content, the same is rarely true of computerized decision support systems, which struggle with the complexity and ambiguity of natural language. A possible remedy is represented by deep learning, which overcomes several shortcomings of traditional methods of text mining. For instance, recurrent neural networks, such as long short-term memories, employ hierarchical structures, together with a large number of hidden layers, to automatically extract features from ordered sequences of words and capture highly non-linear relationships such as context-dependent meanings. However, deep learning has only recently started to receive traction, possibly because its performance is largely untested. Hence, this paper studies the use of deep neural networks for financial decision support. We additionally experiment with transfer learning, in which we pre-train the network on a different corpus with a length of 139.1 million words. Our results reveal a higher directional accuracy as compared to traditional machine learning when predicting stock price movements in response to financial disclosures. Our work thereby helps to highlight the business value of

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