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Enhancing Social Media Analysis with Visual Data Analytics: A Deep Learning Approach

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Abstract

This research methods article proposes a visual data analytics framework to enhance social media research using deep learning models. Drawing on the literature of information systems and marketing, complemented with data-driven methods, we propose a number of visual and textual content features including complexity, similarity, and consistency measures that can play important roles in the persuasiveness of social media content. We then employ state-of-the-art machine learning approaches such as deep learning and text mining to operationalize these new content features in a scalable and systematic manner. For the newly developed features, we validate them against human coders on Amazon Mechanical Turk. Furthermore, we conduct two case studies with a large social media dataset from Tumblr to show the effectiveness of the proposed content features. The first case study demonstrates that both theoretically motivated and data-driven features significantly improve the model's power to predict the popularity of a post, and the second highlights the relationships between content features and consumer evaluations of the corresponding posts. The proposed research framework illustrates how deep learning methods can enhance the analysis of unstructured visual and textual data for social media research.

Keywords: Social media, visual data analytics, prediction, machine learning, deep learning, word embedding, image-text similarity