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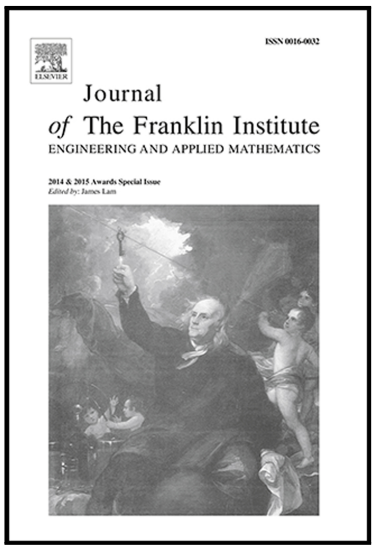

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PII: S0016-0032(17)30300-9
DOI: 10.1016/j.jfranklin.2017.06.007
Reference: FI 3025

To appear in: *Journal of the Franklin Institute*

Received date: 30 September 2016
Revised date: 25 May 2017
Accepted date: 16 June 2017

Please cite this article as: Iti Chaturvedi, Edoardo Ragusa, Paolo Gastaldo, Rodolfo Zunino, Erik Cambria, Bayesian Network based Extreme Learning Machine for Subjectivity Detection, *Journal of the Franklin Institute* (2017), doi: 10.1016/j.jfranklin.2017.06.007

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Bayesian Network based Extreme Learning Machine for Subjectivity Detection

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Abstract

Subjectivity detection is a task of natural language processing that aims to remove 'factual' or 'neutral' content, i.e., objective text that does not contain any opinion, from online product reviews. Such a pre-processing step is crucial to increase the accuracy of sentiment analysis systems, as these are usually optimized for the binary classification task of distinguishing between positive and negative content. In this paper, we extend the extreme learning machine (ELM) paradigm to a novel framework that exploits the features of both Bayesian networks and fuzzy recurrent neural networks to perform subjectivity detection. In particular, Bayesian networks are used to build a network of connections among the hidden neurons of the conventional ELM configuration in order to capture dependencies in high-dimensional data. Next, a fuzzy recurrent neural network inherits the overall structure generated by the Bayesian networks to model temporal features in the predictor. Experimental results confirmed the ability of the proposed framework to deal with standard subjectivity detection problems and also proved its capacity

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