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Predicting Social Media Virality Using Stacking Ensemble with Random Forest, XGBoost and Logistic Regression

Publisher: IEEE Cite This PDF

Upasana Adhikari ; Subir Gupta ; Joyjit Patra All Authors

Abstract

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Abstract:
The research investigates predicting the virality of content on social media platforms using a stacking ensemble model with Random Forest, XGBoost, and Logistic Regression. Social media trends and user interactions remain largely uncontrollable, but this approach seeks to address those issues using sophisticated machine learning methods. Parlor models in itchnology tend to ignore the persistent inconsistencies associated with worldwide phenomena of viral content or fail to generalize adequately. The study model addresses these shortcomings with a balanced dataset and attention to feature importance calculated with user engagement defined as shares, likes, and comments. Incorporating Random Forest and XGBoost improves model robustness when faced with complicated cases while increasing overall accuracy. At the same time, “meta-classifier” Logistic Regression further improves results by integrating diverse base model predictions. This research is unique in employing an optimized stacking ensemble model to significantly enhance predictions of social media virality. This model extends academic frontiers and provides actionable knowledge to firms and content developers who wish to improve their engagement through targeted marketing in the ever-evolving digital ecosystem.

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I. Introduction

The growing adoption of social media as a primary means of communication, advertising, and information dissemination has fostered a shift toward developing virality prediction models[1]. Analyzing the factors that contribute to the fast proliferation of digital information is crucial to businesses, policymakers, and content creators. The volume of user engagement on social media is exceedingly high on a daily basis, and thus requires the development of accurate, scalable, and interpretable models to predict content attention reach[2]. Addressing this gap using traditional algorithms from the family of machine learning has shown a lack of generalization, robustness, and computational efficacy. Incorporating ensemble learning strategies, especially stacking models, presents an effective solution by utilizing multiple base learners for enhanced predictive accuracy and tackling these gaps. As highlighted, the problem wit on social media platforms is that it is fundamentally unpredictable[3]. Unlike trad have a standard method of solving, the viral nature of content is driven by the interplay between features of the content, user interactions, trends, timing, and platform algorithms. These complex dependencies are often overlooked by existing models, resulting in inefficient predictions and unsatisfactory insights[4]. Furthermore, datasets designed for social media virality prediction are extremely unbalanced, with only a few posts achieving virality while the majority stay unnoticed[5]. Because of this, traditional classifiers have a difficult time differentiating between viral and non-viral content. In

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Figures

References

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