



Article

Leveraging Stacking Framework for Fake Review Detection in the Hospitality Sector

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Abstract: Driven by motives of profit and competition, fake reviews are increasingly used to manipulate product ratings. This trend has caught the attention of academic researchers and international regulatory bodies. Current methods for spotting fake reviews suffer from scalability and interpretability issues. This study focuses on identifying suspected fake reviews in the hospitality sector using a review aggregator platform. By combining features and leveraging various classifiers through a stacking architecture, we improve training outcomes. User-centric traits emerge as crucial in spotting fake reviews. Incorporating SHAP (Shapley Additive Explanations) enhances model interpretability. Our model consistently outperforms existing methods across diverse dataset sizes, proving its adaptable, explainable, and scalable nature. These findings hold implications for review platforms, decision-makers, and users, promoting transparency and reliability in reviews and decisions.

Keywords: fake review detection; machine learning; SHAP; fake review identification; review spam identification; hospitality; ecommerce; Yelp



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1. Introduction

Effective decision-making heavily hinges on information search processes. Within the realm of e-commerce, consumer choices are significantly influenced not only by the information disseminated by companies but also by the evaluations of fellow product purchasers [1]. Gradually, these product reviews have transitioned into an integral facet of consumers' purchasing decisions, with a staggering 90% of customers consulting online reviews prior to making purchase-related choices. Remarkably, 88% of consumers place a level of trust in online reviews akin to personal recommendations [2]. This escalating reliance on such reviews, however, unravels a concern of manipulation in the decision-making process through the injection of fabricated reviews [3].

Managers have realized the potential of reviews on consumer engagement intention, leading some of them to engage in review manipulation [4]. Fabricated reviews encompass two distinct categories: destructive and deceptive. Destructive reviews often serve as mere promotional content that bears no relation to the actual product experience. On the other hand, deceptive reviews are particularly harmful as they spread false information that can seriously harm businesses and result in significant financial loss [5]. Notably, even renowned platforms like Tripadvisor have struggled to grapple with the pervasive issue of counterfeit reviews. This is demonstrated by their multiple shifts in slogans over the years, underscoring the complexity of distinguishing genuine reviews from fraudulent