

Fake Review Detection using Supervised and Semi-Supervised Learning with Natural Language Processing Techniques in Python

K. Mahesh¹, K. Hari Priya², K. V. S Meghana³, K. Om Sai Vinay⁴, N. Anil Chakravarthy⁵

Students, Department of Computer Science and Engineering^{1,2,3,4}

Assistant Professor, Department of Computer Science and Engineering^{1,2,3,4}

Raghu Institute of Technology, Visakhapatnam, AP, India

Abstract: *This research paper explores the use of supervised and semi-supervised learning techniques along with natural language processing in Python for detecting fake reviews. The study discusses the importance of detecting fake reviews and its impact on businesses and customers. The proposed approach involves extracting relevant features from text data using various natural language processing techniques and training supervised learning models such as logistic regression, support vector machines, and random forests. Additionally, a semi-supervised learning technique called self-training is employed to improve the model's performance using unlabeled data. The effectiveness of the proposed approach is evaluated on a dataset of reviews from Amazon and Yelp, and the results show that the models achieve high accuracy in detecting fake reviews. The study concludes that the proposed approach can be a useful tool for businesses and customers to identify and filter out fake reviews.*

Keywords: Fake review detection, Supervised learning, Semi-supervised learning, Natural language processing, Python programming, Machine learning, Sentiment analysis, Text classification, Data pre processing

REFERENCES

- [1]. Pang, B., & Lee, L. (2008). Opinion mining and sentiment analysis. *Foundations and Trends® in Information Retrieval*, 2(1–2), 1–135.
- [2]. Jindal, N., & Liu, B. (2008). Opinion spam and analysis. In *Proceedings of the International Conference on Web Search and Web Data Mining* (pp. 219–230).
- [3]. Akhtar, W., & Siddiqui, M. K. (2017). A survey of fake reviews detection techniques. *Journal of King Saud University-Computer and Information Sciences*, 29(4), 520–535.
- [4]. Joachims, T. (1998). Text categorization with support vector machines: Learning with many relevant features. In *European conference on machine learning* (pp. 137–142).
- [5]. Chen, Z., Mukherjee, A., & Liu, B. (2012). Yelp review filtering: Language, rating, and usefulness. In *Proceedings of the International Conference on Web Search and Data Mining* (pp. 443–452).