


# Chapter 11

## Aspect–Based Opinion Mining: A Framework for Spam and Ham Review Detection

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### ABSTRACT

*Sentiment Analysis deals with analyzing users comment on a particular thing and then computationally figuring out the actual sentiment of the user i.e Positive or Negative. The process of computationally identifying and categorizing opinions expressed in a piece of text, especially in order to determine whether the writer's attitude towards a particular topic, product, etc. is positive or negative. This chapter presents a comprehensive review of over 50 papers on sentiment analysis, featuring a comparative analysis of various research techniques. The review highlights strengths and weaknesses of existing methods, identifies research gaps, and provides a foundation for future research directions. In this chapter Naive Bayes approach*

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*is used for sentiment prediction, specifically for SPAM and HAM detection. The prediction model is trained using the Naive Bayes algorithm, and the training set is fitted using the WordNet library.*

## **INTRODUCTION**

In the age of digital communication, user-generated content such as reviews and feedback plays a pivotal role in shaping public opinion and consumer behavior (Valakunde et al., 2013). However, the growing volume of online reviews has also given rise to the problem of spam and opinion manipulation, necessitating robust methods for sentiment analysis and spam detection. Numerous computational techniques have emerged to address these challenges, ranging from traditional machine learning algorithms like K-Nearest Neighbor (KNN), Naive Bayes, Random Tree, and Random Forest, to advanced natural language processing (NLP) strategies such as syntactic dependency parsing, latent semantic analysis (LSA), and word sense disambiguation (WSD) (Fan et al., 2008; Li et al., 2010)

Recent studies have explored various approaches to improve the accuracy and efficiency of spam detection and feature-level sentiment classification (Lau et al., 2011). Models such as the Sentiment Miner algorithm have demonstrated enhanced performance by incorporating detailed tagging (e.g., Strongly Positive to Strongly Negative) and handling complex linguistic structures like negations and intensifiers. Additionally, techniques like dependency tree parsing and multi-word phrase analysis have proven effective in extracting nuanced sentiment expressions from user reviews.

Furthermore, frameworks that support multilingual sentiment analysis and verb-based classification have contributed to a deeper understanding of opinion orientation, especially in diverse linguistic settings (Jain et al., 2023; Khan et al., 2011). The integration of feature weighting, spam scoring models, and rule-based thwarting detection also offers promising improvements in identifying deceptive content and refining opinion mining processes (Kasthuriarachchy et al., 2014).

## **LITERATURE REVIEW**

### **1. Review Outcome in the Issue “Feature Level Sentiment Analysis With Spam Detection”**

Jindal et al., (2008) were the first to formally define the opinion spam problem, focusing on fake item reviews, particularly on Amazon. They identified three types of spam reviews: non-reviews, brand-only reviews, and untruthful reviews. Their study

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