

From Spam to Ham: SMS Detection via Naïve Bayes

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About the Research Paper

Title: SMS Spam and Ham Detection Using Naïve Bayes Algorithm

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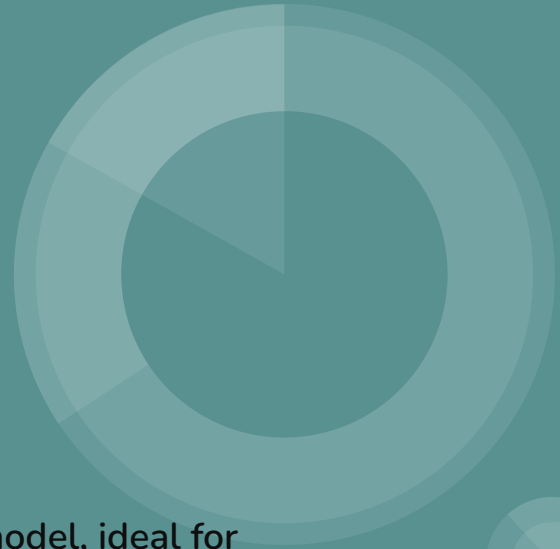
Objective: To develop an effective method for differentiating between spam (unwanted or fraudulent messages) and ham (legitimate messages) in SMS using the Naïve Bayes algorithm.

Introduction to SMS Spam Detection

- SMS is a widespread communication tool, but its popularity has led to an increase in spam messages.
- SMS spam includes unsolicited, often fraudulent messages, posing security risks and user inconvenience.
- Detecting and filtering spam is essential for user safety and maintaining communication integrity.

Overview of Naïve Bayes Classifier

- Naïve Bayes is a probabilistic machine learning model, ideal for classification tasks.
- Based on Bayes' theorem, it assumes independence between features of the data.
- It's particularly effective for text data, making it suitable for SMS spam detection.



Dataset Description

- Dataset used: 'smsspamcollection' from the UCI machine learning repository.
- It contains labeled SMS messages, identified as either spam or ham.
- The dataset balance and size are crucial for training and testing the model.

Pre-processing Steps - Overview

- Pre-processing transforms raw text into structured data for machine learning.
- It involves cleaning the text, stemming and lemmatization, and vectorization.



Pre-processing Steps - Text Cleaning

- Text cleaning removes irrelevant characters and standardizes text format.
- This step reduces noise and variations in the dataset.



Pre-processing Steps - Stemming and Lemmatization

- Stemming simplifies words to a base form, sometimes leading to inaccuracy.
- Lemmatization converts words to their meaningful base form, considering context.
- Both processes reduce text complexity and variability.

Pre-processing Steps - Vectorization

- Vectorization converts text to numerical format for algorithm comprehension.
- Techniques include Bag of Words and TF-IDF, highlighting word importance.

Experiment Setup and Execution

- The Naïve Bayes model was trained using the pre-processed dataset.
- Specific model configurations and parameters were set for optimal performance.
- The model was tested and evaluated for its accuracy in spam detection.

Results

- Performance metrics used: accuracy, precision, recall.
- The Naïve Bayes model showed high effectiveness in identifying spam messages.
- Comparative performance with other methods, if available, should be included.

Conclusion and Key Takeaways

- The study validates the effectiveness of Naïve Bayes in SMS spam detection.
- Highlights the importance of data pre-processing in text classification.
- Suggests avenues for future research and potential improvements.

Further Reading and References

- Intelligent spam classification for mobile text messages," by K. Mathew and B. Isaac. The 2011 International Conference on Computer Science and Network Technology has published its proceedings
- (2017): 63-70. "Spam Detection on Social Media Text." G. Jain and B. Manisha Jain.
- P. Navaney, G. Dubey, and A. Rana (2018). "Supervised Machine Learning Algorithms for SMS Spam Filtering."
- K. Nigam and A. McCallum. In 1998, he presented "At the AAAI-98 Workshop on Learning for Text Categorization, he presented "A comparison of event models for naive bayes text classification."
- J. Goodman and W. Tau Yih. Training for discriminative spam filters is available online. The Third International Conference on Email and Anti-Spam is a gathering of experts in the field of email and anti-spam (Mountain View,CA, 2006).

Thank You !!

