

# Sentiment Analysis

-an implementation to analyze Yelp Restaurant reviews

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# A GENDA

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- **Introduction**
  - Basic concepts
- **Our Proposal**
- **Implementation**
- **Results and Analysis**
- **Review Questions**

# INTRODUCTION

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## **What is Sentiment Analysis?**

- NLP and text classification to identify subjective information from text
- Process of determining a text as positive, negative or neutral.

## **What is the purpose of Sentiment Analysis?**

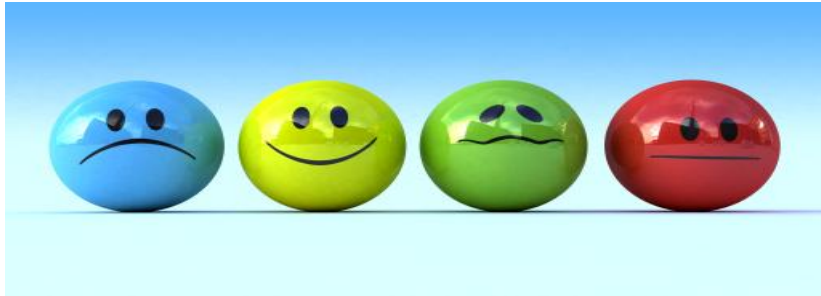
- Determines the true attitude of the speaker
- Conforming of ratings with the sentiment of reviewer
- Determining the intended emotional communication

## **How does Sentiment Analysis works?**

- Classifies the polarity of a given text in a document

# Why Sentiment Analysis?

- **Movie** : is this review positive or negative?
- **Products** : what do people think about new phone?
- **Public sentiment** : how much confidence does user have?
- **Politics**: what do people think about this candidate or issue?
- **Predict**: Predict election outcomes or market trends from sentiments.



Coursera. (n.d.). Retrieved May 08, 2016, from <https://class.coursera.org/nlp/lecture/31>

# OUR PROPOSAL:

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## Challenges involved in Sentiment Analysis

- Detection of fake, spam reviews
- Automatic irony detection



## To address above challenges

- Neural network or complex text analysis algorithms like deep learning algorithm can be used



## Our Motivation

- Most of the systems are not built for users to use in everyday operations while we thought of developing a mobile application for daily use



## Our Proposal

- Easy to use classifying system which can calculate the sentiment fairly accurate and on the go
- Use Naive Bayes Classifier in combination with SentiWordNet score

# EVALUATION

## How to evaluate a system?

- Accurately evaluating a sentiment analysis system is complex
- The accuracy of a sentiment analysis system depends on how well it agrees with human judgments. This is usually measured by precision and recall. However, according to research human raters typically agree 79%[1] of the time
- Hence, a 70% accurate program is doing nearly as well as humans do, even if such accuracy may not look good
- Even if a program were "right" all of the time(100%), humans would still disagree with it about 20% of the time, since they disagree that much about *any* answer [2]

[1] Ogneva, M. "How Companies Can Use Sentiment Analysis to Improve Their Business". Mashable. Retrieved 2012-12-13.

[2] Roebuck, K. *Sentiment Analysis: High-impact Strategies - What You Need to Know: Definitions, Adoptions, Impact, Benefits, Maturity, Vendors*.

## Naive Bayes Classifier

- Simple probabilistic classifier based on Bayes' theorem
- Calculates conditional probability in the form of positive and negative score for each word

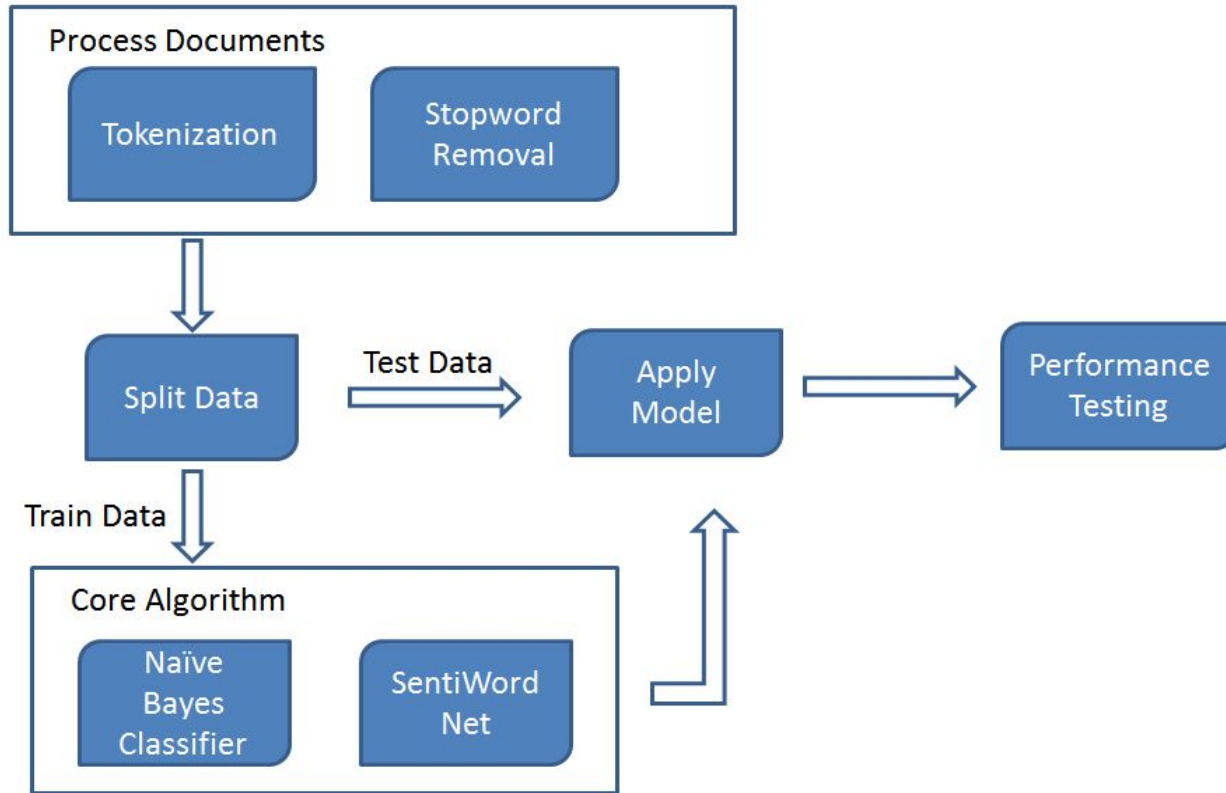
## SentiWordNet[3]

- SentiWordNet is a lexical resource for opinion mining.
- It assigns to each word three sentiment scores: positivity, negativity, objectivity.

[3] Baccianella, Stefano, Andrea Esuli, and Fabrizio Sebastiani. "SentiWordNet 3.0: An Enhanced Lexical Resource for Sentiment Analysis and Opinion Mining." *LREC*. Vol. 10. 2010.

# SYSTEM DESIGN

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# EXTRA FEATURES

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## Emoticons

- Handles smileys which may be a strong indication of sentiment in a review.
- Detects Happy, Sad and Laughing emoticons.

## Android Application

- Using the native android system as a platform for this service, we provide all the features that comes along with the OS.
- E.g. Spell checks and auto correct.
- Clipboard functions to quickly copy and paste reviews found on web.

## Tandoor of India Henrietta NY

376 Jefferson Rd, Rochester, NY

[Write a review](#)

4.1 ★★★★★ 63 reviews

Sort by: Most helpful ▾



Alex Reid

4 months ago ·

★★★★★ Tandoor has a wide range of selections during their reasonably priced lunch buffet. The chicken dishes and saag paneer are very good, and the chai is phenomenal. Great for groups!

## Tandoor of India Henrietta NY

376 Jefferson Rd, Rochester, NY

[Write a](#)

4.1 ★★★★★ 63 reviews

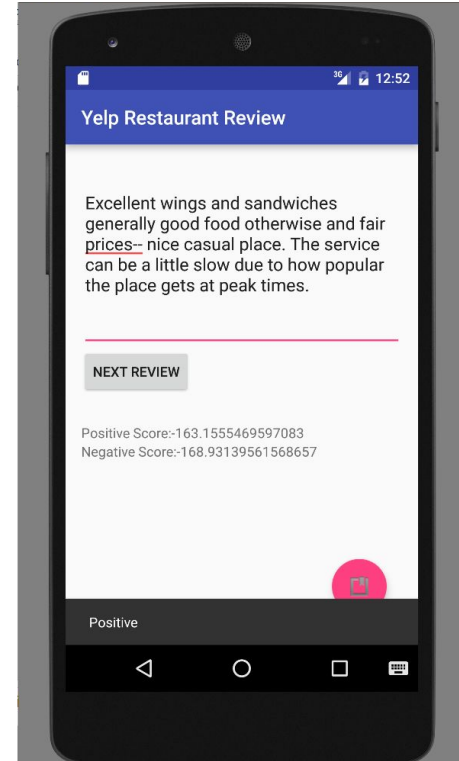
Sort by: Most he



Collin Van Laeken

2 months ago

★☆☆☆☆ Decent food but staff is pretty arrogant about their food quality. I've been there multiple times and as someone who is pretty open to cultural and personal differences, I continue to be impressed with the poor attitude of the staff.



# RESULTS AND ANALYSIS

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## **Accuracy of our algorithm:**

- Fairly accurate
- Uses 2000 positive and 2000 negative reviews each as training set
- We use 90-10 split for our training and testing data
- Gives an accuracy of 77.25%
- With correctly classified 309 out of 400 test reviews

Coursera. (n.d.). Retrieved May 08, 2016, from <https://class.coursera.org/nlp/lecture/31>

# LIMITATIONS

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## **Some drawbacks of our system:**

- Does not handle sarcasm accurately
- Does not provide a neutral sentiment
- Currently does not support retrieving real time data straight from Yelp
- Only handles 3 emoticons for now

# RELATED WORK

- Twitter Sentiment App
- Focuses on visualizing the sentiment of tweets posted on Twitter



(n.d.). Retrieved May 08, 2016, from [https://www.csc.ncsu.edu/faculty/healey/tweet\\_viz/tweet\\_app/](https://www.csc.ncsu.edu/faculty/healey/tweet_viz/tweet_app/)

