

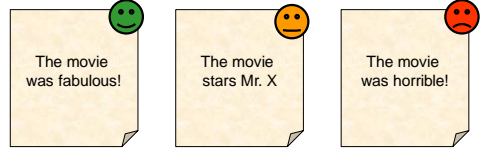
# Approaches to Sentiment Analysis

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Based in part on notes from Aditya Joshi

## What is Sentiment Analysis?

- Identify the orientation of opinion in a piece of text



- Can be generalized to a wider set of emotions

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## Motivation

- Knowing sentiment is a very natural ability of a human being.

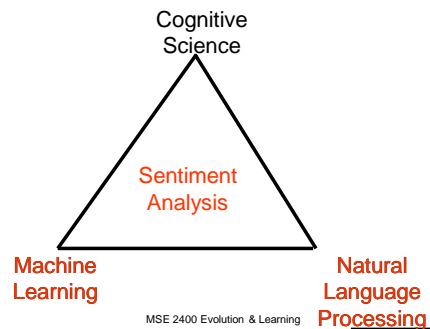
Can a machine be trained to do it?

- SA aims at getting sentiment-related knowledge especially from the huge amount of information on the internet
- Can be generally used to understand opinion in a set of documents

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## Tripod of Sentiment Analysis



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## Challenges

- Contrasts with standard text-based categorization
- Domain dependent
- Sarcasm
- Thwarted expressions

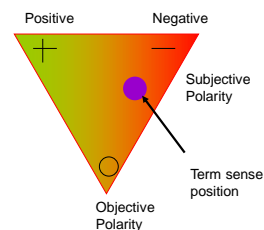
the sentences/words that contradict the overall sentiment of the set are in majority

**Example:** The actors are good, the music is brilliant and appealing. Yet, the movie fails to strike a chord.

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## Quantifying sentiment



Each term has a Positive, Negative and Objective score. The scores sum to one.

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## Approach 1: Using adjectives

- Many adjectives have high sentiment value
  - A 'beautiful' bag 😊
  - A 'wooden' bench 😐
  - An 'embarrassing' performance 😞
- Focusing on adjectives might be beneficial

## Approach 2: Using Adverb-Adjective Combinations (AACs)

- Calculate sentiment value based on the effect of adverbs on adjectives
- Linguistic ideas:
  - **Adverbs of affirmation:** certainly
  - **Adverbs of doubt:** possibly
  - **Strong intensifying adverbs:** extremely
  - **Weak intensifying adverbs:** scarcely
  - **Negation and Minimizers:** never

## Approach 3: Subject-based SA

- Examples:

The horse bolted.



The movie lacks a good story.



## Lexical Analysis

subj. **bolt**

[b]

[VB]

[bolt]

[subj]

Argument that receives the sentiment (subj./obj.)

subj. **lack** obj.

[b]

[VB]

[lack]

[obj]

[~subj]

Argument that sends the sentiment (subj./obj.)

Argument that receives the sentiment (subj./obj.)

## Example

The movie lacks a good story.



The movie lacks \S+.



Lexicon :

G JJ good obj.

B VB lack obj ~subj.

Steps :

- 1) Consider a context window of upto five words
- 2) Shallow parse the sentence
- 3) Step-by-step calculate the sentiment value based on lexicon and by adding '\S+' characters at each step

## Applications

- Review-related analysis
- Developing 'hate mail filters' analogous to 'spam mail filters'
- Question-answering (Opinion-oriented questions may involve different treatment)