

# NLP

# Introduction to NLP

## *Sentiment Analysis*

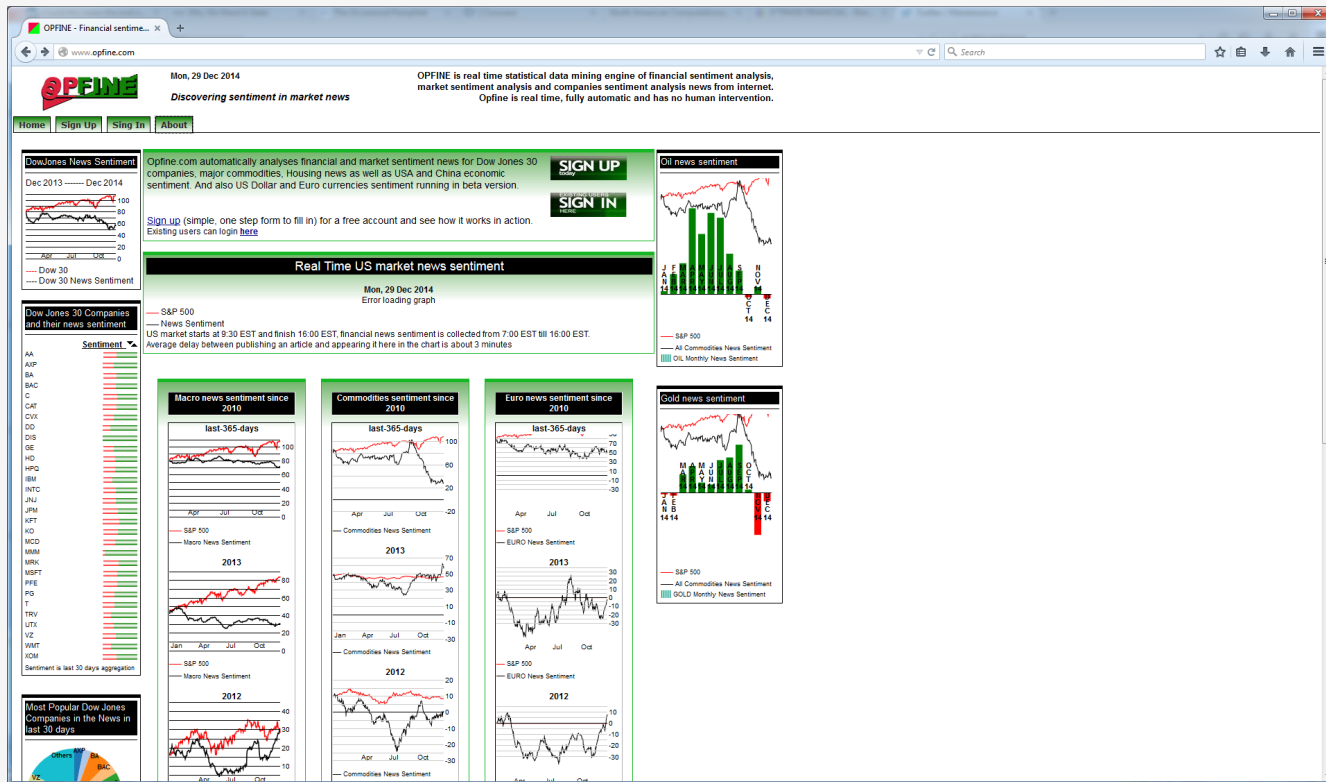
# Reviews of *1Q84* by Haruki Murakami

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# Sentiment About Companies



## Other Examples

- Movie reviews
- Product reviews
- Debates
  - [www.createdebate.com](http://www.createdebate.com)

# Introduction

- Many posts, blogs
- Expressing personal opinions
- Research questions
  - Subjectivity analysis
  - Polarity analysis (positive/negative, number of stars)
  - Viewpoint analysis (Chelsea vs. Manchester United, republican vs. democrat)
- Sentiment target
  - entity
  - aspect

# Introduction

- Level of granularity
  - Document
  - Sentence
  - Attribute
- Opinion words
  - Base
  - Comparative (better, slower)



# Introduction

- Just counting negative words is not enough
- Negation analysis

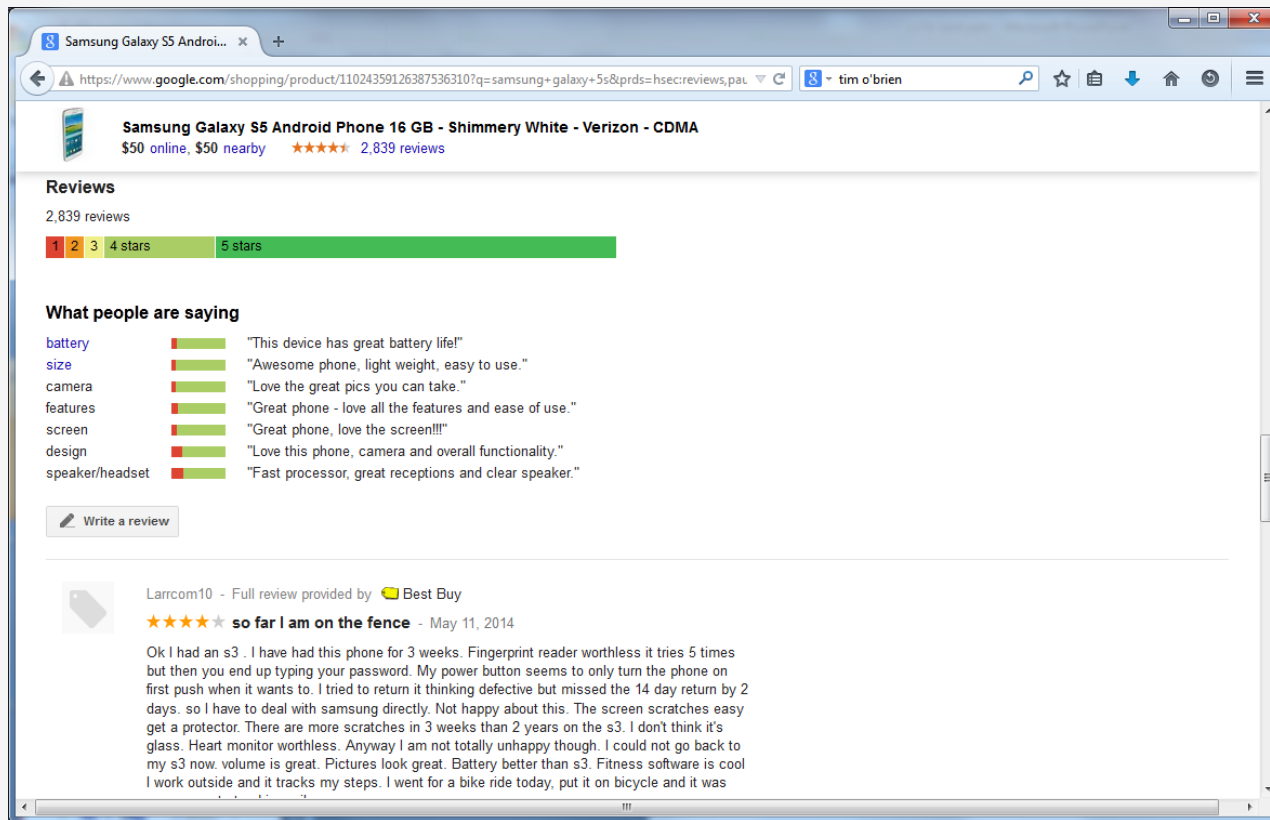
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# Product Reviews



**Samsung Galaxy S5 Android Phone 16 GB - Shimmery White - Verizon - CDMA**  
\$50 online, \$50 nearby ★★★★★ 2,839 reviews

### Reviews

2,839 reviews


1 2 3 4 stars 5 stars

#### What people are saying

Feature	Rating	Comment
battery	★★★★★	"This device has great battery life!"
size	★★★★★	"Awesome phone, light weight, easy to use."
camera	★★★★★	"Love the great pics you can take."
features	★★★★★	"Great phone - love all the features and ease of use."
screen	★★★★★	"Great phone, love the screen!!!!"
design	★★★★★	"Love this phone, camera and overall functionality."
speaker/headset	★★★★★	"Fast processor, great receptions and clear speaker."

[Write a review](#)

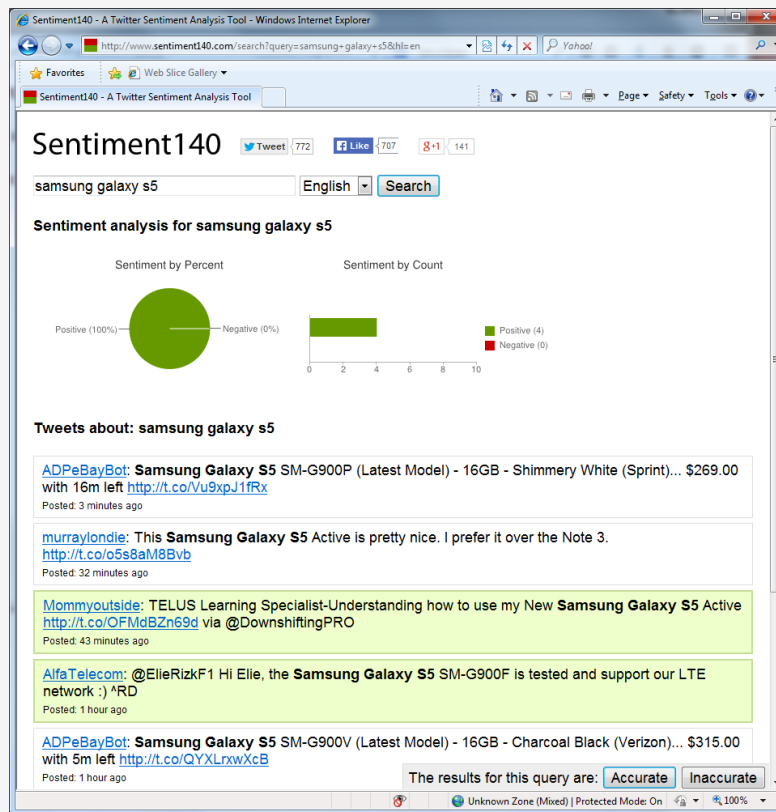
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 **Best Buy**

★★★★★ **so far I am on the fence** - May 11, 2014

Ok I had an s3. I have had this phone for 3 weeks. Fingerprint reader worthless it tries 5 times but then you end up typing your password. My power button seems to only turn the phone on first push when it wants to. I tried to return it thinking defective but missed the 14 day return by 2 days. so I have to deal with samsung directly. Not happy about this. The screen scratches easy get a protector. There are more scratches in 3 weeks than 2 years on the s3. I don't think it's glass. Heart monitor worthless. Anyway I am not totally unhappy though. I could not go back to my s3 now. volume is great. Pictures look great. Battery better than s3. Fitness software is cool I work outside and it tracks my steps. I went for a bike ride today, put it on bicycle and it was

# Twitter Sentiment



# Problems

- Subtlety
- Concession
- Manipulation
- Sarcasm and irony

# SA as a Classification Problem

- Set of features
  - Words
    - Presence is more important than frequency
  - Punctuation
  - Phrases
  - Syntax
- A lot of training data is available
  - E.g., movie review sentences and stars
  - <http://www.cs.cornell.edu/people/pabo/movie-review-data>
- Techniques
  - MaxEnt
  - SVM
  - Naive Bayes

# Resources

- CMU Twitter parser
  - <http://www.ark.cs.cmu.edu/TweetNLP/>



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