Sentiment Analysis

What is Sentiment Analysis?

Dan Jurafsky

Positive or negative movie review?

- unbelievably disappointing
- Full of zany characters and richly applied satire, and some great plot twists
- this is the greatest screwball comedy ever filmed
- It was pathetic. The worst part about it was the boxing scenes.

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Google Product Search

HP Officejet 6500A Plus e-All-in-One Color Ink-jet - Fax / copier / printer / scanner
$89 online, $100 nearby   ★★★★☆ 377 reviews
September 2010 - Printer - HP - Inkjet - Office - Copier - Color - Scanner - Fax - 250 sh

Reviews

Summary - Based on 377 reviews

1 star	2	3	4 stars	5 stars

What people are saying

ease of use	"This was very easy to setup to four computers."
value	"Appreciate good quality at a fair price."
setup	"Overall pretty easy setup."
customer service	"I DO like honest tech support people."
size	"Pretty Paper weight."
mode	"Photos were fair on the high quality mode."
colors	"Full color prints came out with great quality."

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Bing Shopping

HP Officejet 6500A E710N Multifunction Printer

Product summary   Find best price   **Customer reviews**   Specifications   Related items

$121.53 - $242.39 (14 stores)

☐ Compare

Average rating ★★★½☆ (144)

★★★★★	▬▬▬▬	(55)
★★★★☆	▬▬▬▬	(54)
★★★☆☆	▪	(10)
★★☆☆☆	▪	(6)
★☆☆☆☆	▬	(23)
☆☆☆☆☆		(0)

Most mentioned

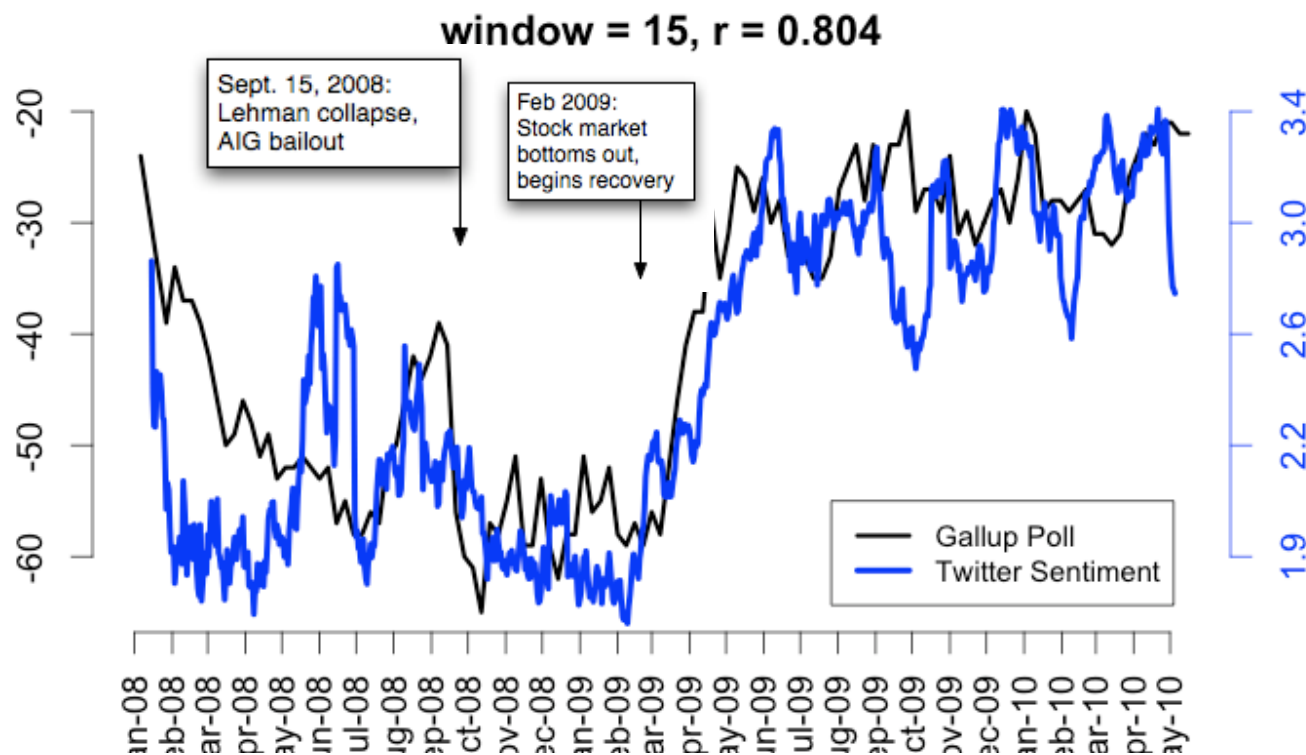|		
Performance	▬▬	(57)
Ease of Use	▬▬▬	(43)
Print Speed	▬▬	(39)
Connectivity	▬▬▬	(31)
More ▼		

Show reviews by source

Best Buy (140)
CNET (5)
Amazon.com (3)

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Twitter sentiment versus Gallup Poll of Consumer Confidence

Brendan O'Connor, Ramnath Balasubramanyan, Bryan R. Routledge, and Noah A. Smith. 2010.
From Tweets to Polls: Linking Text Sentiment to Public Opinion Time Series. In ICWSM-2010
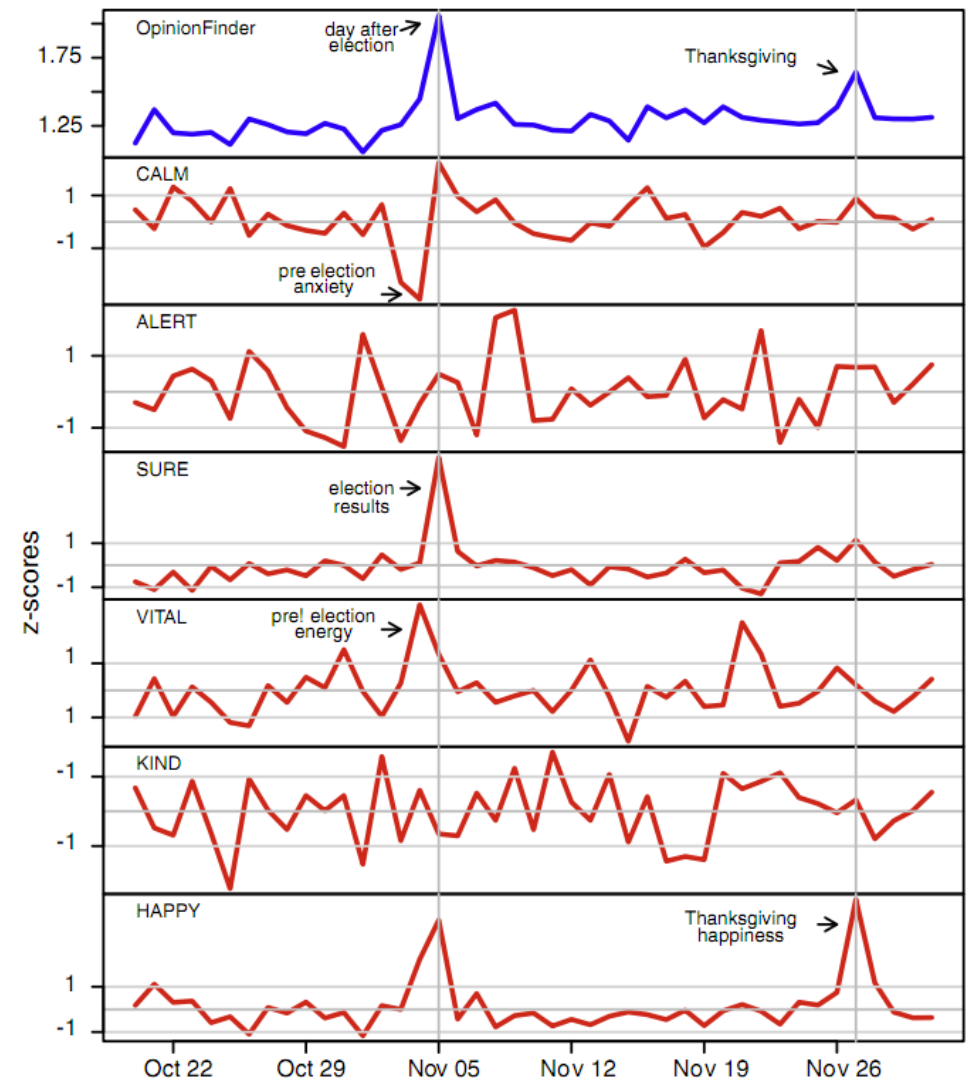
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Twitter sentiment:

Johan Bollen, Huina Mao, Xiaojun Zeng. 2011.
Twitter mood predicts the stock market,
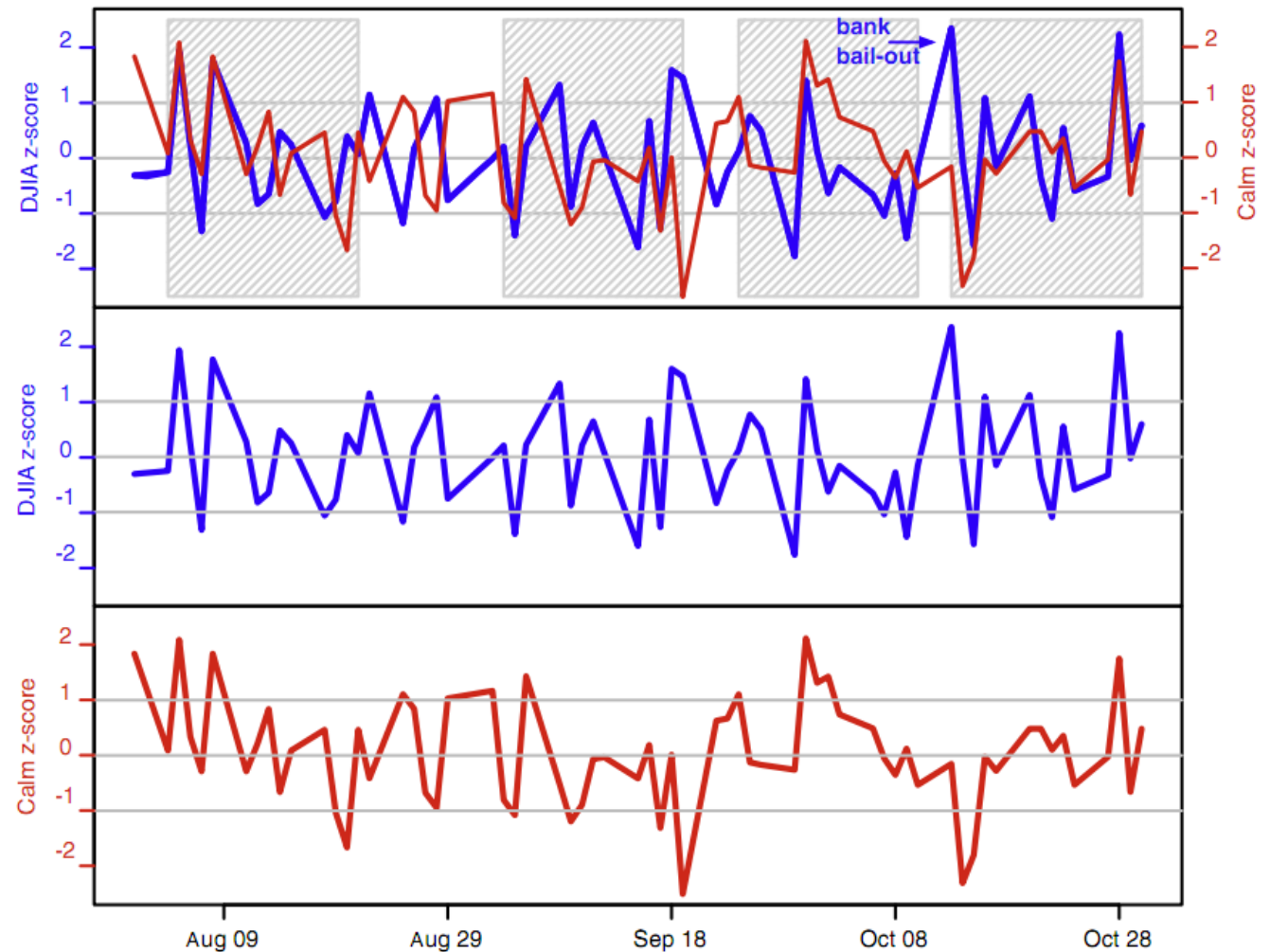Journal of Computational Science 2:1, 1-8.
10.1016/j.jocs.2010.12.007.

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Bollen et al. (2011)

- CALM predicts DJIA 3 days later

- At least one current hedge fund uses this algorithm
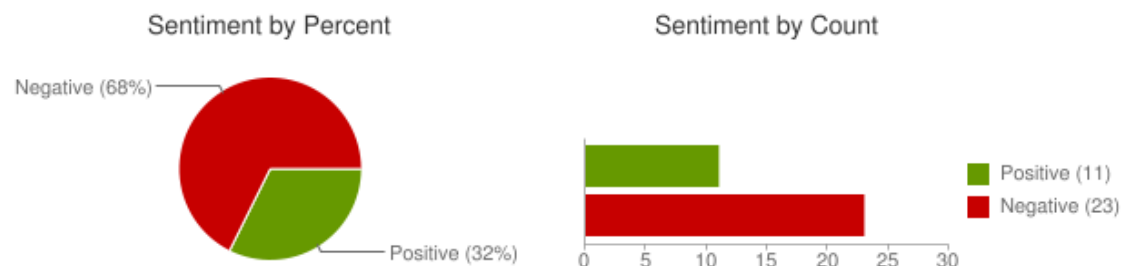

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Target Sentiment on Twitter

- ## Twitter Sentiment App
- Alec Go, Richa Bhayani, Lei Huang. 2009. Twitter Sentiment Classification using Distant Supervision

Type in a word and we'll highlight the good and the bad

| "united airlines" | Search | Save this search |

Sentiment analysis for "united airlines"

Sentiment by Percent   Sentiment by Count

Negative (68%)
Positive (32%)

Positive (11)
Negative (23)

jljacobson: OMG... Could **@United airlines** have worse customer service? W8g now 15 minut
Posted 2 hours ago

12345clumsy6789: I hate **United Airlines** Ceiling!!! Fukn impossible to get my conduit in this d
Posted 2 hours ago

EMLandPRGbelgiu: EML/PRG fly with Q8 **united airlines** and 24seven to an exotic destinatio
Posted 2 hours ago

CountAdam: FANTASTIC customer service from **United Airlines** at XNA today. Is tweet more,
Posted 4 hours ago

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Sentiment analysis has many other names

- Opinion extraction
- Opinion mining
- Sentiment mining
- Subjectivity analysis

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Why sentiment analysis?

- *Movie*: is this review positive or negative?
- *Products*: what do people think about the new iPhone?
- *Public sentiment*: how is consumer confidence? Is despair increasing?
- *Politics*: what do people think about this candidate or issue?
- *Prediction*: predict election outcomes or market trends from sentiment

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Scherer Typology of Affective States

- **Emotion**: brief organically synchronized … evaluation of a major event
  - *angry, sad, joyful, fearful, ashamed, proud, elated*
- **Mood**: diffuse non-caused low-intensity long-duration change in subjective feeling
  - *cheerful, gloomy, irritable, listless, depressed, buoyant*
- **Interpersonal stances**: affective stance toward another person in a specific interaction
  - *friendly, flirtatious, distant, cold, warm, supportive, contemptuous*
- **Attitudes**: enduring, affectively colored beliefs, dispositions towards objects or persons
  - *liking, loving, hating, valuing, desiring*
- **Personality traits**: stable personality dispositions and typical behavior tendencies
  - *nervous, anxious, reckless, morose, hostile, jealous*

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Sentiment Analysis

- Sentiment analysis is the detection of **attitudes**

   "enduring, affectively colored beliefs, dispositions towards objects or persons"

   1. **Holder (source)** of attitude

   2. **Target (aspect)** of attitude

   3. **Type** of attitude

      - From a set of types
         - *Like, love, hate, value, desire,* etc.
      - Or (more commonly) simple weighted **polarity**:
         - *positive, negative, neutral,* together with *strength*

   4. **Text** containing the attitude

      - Sentence or entire document

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Sentiment Analysis

- Simplest task:
  - Is the attitude of this text positive or negative?

- More complex:
  - Rank the attitude of this text from 1 to 5

- Advanced:
  - Detect the target, source, or complex attitude types

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