“YEAH RIGHT”

SARCASM RECOGNITION FOR SPOKEN DIALOGUE SYSTEMS

Yoonji Shin
Yoonji Shin

Studying CS in Columbia University

Junior in undergrad
Yoonji Shin

Studying CS in Columbia University

Junior in undergrad

GREAT DANCER!
Yoonji Shin

Studying CS in Columbia University
Junior in undergrad

GREAT DANCER!

“YEAH RIGHT!”
What is a Sarcasm?

Semantic Interpretation

Sarcasm

Literal Meaning
Sarcasm

**Why**
- Complex semantic nature
  - Violates Grice’s maxim
  - Frequent appearance

**Important**

**What is a Sarcasm?**

**Semantic Interpretation**

**Literal Meaning**
Which “Yeah Right” is it?
Which “Yeah Right” is it?
Which “Yeah Right” is it?

**Goal:** Train an automatic sarcasm recognizer using spectral, contextual, and prosodic cues.
Questions they wanted to answer...

- Best feature to detect sarcasm
  What types of features are most indicative of sarcasm’s presence?

- Formulation
  How sarcasm functions as a speech act?

- Recommend suitable followup action
  How should a dialogue manager respond to sarcasm once detected?
1. Acknowledgement

When a speaker uses a sincere “yeah right” by way of presenting evidence of understanding

A: Oh, well that’s right near Piedmont.
B: Yeah right, right...
Categorization

1. Acknowledgement
   When a speaker uses a sincere “yeah right” by way of presenting evidence of understanding

2. Agreement / Disagreement
   Self explanatory—indicating the speaker “agrees” to something.

A: A thorn in my side: bureaucrats.
B: Yeah right, I agree.
YEAH

RIGHT ON
Which “Yeah Right”?

 ✓ Categorization

1. Acknowledgement

When a speaker uses a sincere “yeah right” by way of presenting evidence of understanding

2. Agreement / Disagreement

Self explanatory--indicating the speaker “agrees” to something.

3. Indirect Interpretation

Type of speech act not directed at the dialogue partner but at a hearer not present as in recounting a past use of sarcastic “yeah right”

A: “…We have too many pets!” I thought, “Yeah right, come tell me about it!” You know?
B: [laughter]  (3)
Yeah! Right,

Very Funny!
Categorization

1. Acknowledgement
   When a speaker uses a sincere “yeah right” by way of presenting evidence of understanding

2. Agreement / Disagreement
   Self explanatory--indicating the speaker “agrees” to something.

3. Indirect Interpretation
   Type of speech act not directed at the dialogue partner but at a hearer not present as in recounting a past use of sarcastic “yeah right”

4. Phrase Internal
   “Yeah right” is not a singular speech unit itself, but is included as part of some larger speech act.
Yeah... Right there
Between those molars
So.. which “yeah right” is sarcastic?
1. Acknowledgement

When a speaker uses a sincere “yeah right” by way of presenting evidence of understanding.

2. Agreement / Disagreement

Self explanatory--indicating the speaker “agrees” to something.

3. Indirect Interpretation

Type of speech act not directed at the dialogue partner but at a hearer not present as in recounting a past use of sarcastic “yeah right”.

4. Phrase Internal

“Yeah right” is not a singular speech unit itself, but is included as part of some larger speech act.
Yeah! Right,

Very Funny!
How did they do it?
Objective Cues

Feature sets used to mark “sarcasm”

1. Laughter
   Sarcasm is often humorous

2. Question / Answer
   “Yeah right” for answering a question is correlated with sincerity

3. Start / End
   Sarcasm “yeah right” usually comes after some elaboration of the joke

4. Pause
   If “yeah right” is preceded or followed by a pause, it’s not likely to be sarcastic

5. Gender
   Men are often more sarcastic than women
Feature sets used to mark “sarcasm”

1. **Laughter**
   - Sarcasm is often humorous

2. **Question / Answer**
   - “Yeah right” for answering a question is correlated with sincerity

3. **Start / End**
   - Sarcastic “yeah right” usually comes after some elaboration of the joke

4. **Pause**
   - If “yeah right” is preceded or followed by a pause, it’s not likely to be sarcastic

5. **Gender**
   - Men are often more sarcastic than women
Q. Isn’t it possible to convert almost all preceding clause of “yeah right” into a question form? If yes, why would Question/Answer form indicate higher possibility for non-sarcastic “yeah right”? 
Q. Isn’t it possible to convert almost all preceding clause of “yeah right” into a question form? If yes, why would Question/Answer form indicate higher possibility for non-sarcastic “yeah right”?

Q. Statistically men uses more sarcasm than women. Statistically Asian countries use less sarcasm than America. >> Can we detect different regional accents to identify where the speaker’s background culture is in order to improve accuracy in detecting sarcasm?
Prosodic and spectral features

1, 2: Average pitch in “yeah” and “right” individually, normalized by the average pitch over the whole utterance
3, 4: Duration of each word, normalized by the utterance’s duration
5, 6: Average energy in each word, normalized by the average energy of the utterance
7, 8, 9, 10: The number of rising and falling frames (positive and negative pitch slopes) in each word, normalized by the total frames in that word
11, 12: The number of inter-frame changes from rising to falling pitch slope within each word, also normalized by the number of frames in that word
13, 14: The overall pitch slope from the first to last frame of each word, normalized by the whole utterance’s overall pitch range
15: The overall pitch slope of the whole utterance, normalized by the whole utterance’s pitch range
16, 17: The pitch range for each word, normalized by the pitch range of the whole utterance
18, 19: The energy range for each word, normalized by the energy range of the whole utterance
✓ “Yeah right” with / without the surrounding context

✓ 2 Human labelers annotated data

- WITHOUT the surrounding context:
  Inter annotator agreement was VERY LOW!
  53.73% agreement (chance agreement of 43.93%)
  Kappa statistics of 0.1569
Why such a low agreement? Is it really that difficult?
Let’s try it!
Let’s try it! - Positive or Negative?

“Yeah”
Male 4
Female 3

“Absolutely”
Male 4
Female 2

“Exactly”
Male 5
Female 4

Source: Dan Jurafsky
✓ “Yeah right” with / without the surrounding context

✓ 2 Human labelers annotated data

- WITHOUT the surrounding context:
  Inter annotator agreement was VERY LOW!
  53.73% agreement (chance agreement of 43.93%)
  Kappa statistics of 0.1569

- WITH the surrounding context:
  Inter annotator agreement was fair (still somewhat low)
  76.67% agreement (chance agreement of 66%)
  Kappa statistics of 0.313

✓ Any disagreements between the two annotators were resolved and the labels were taken as true classes
How did annotators resolve disagreement?
✓ 131 instances of “yeah right” in Switchboard & Fisher

✓ 30 instances of sarcastic “yeah right” (23%)

✓ Presence of laughter seem to be a valid identifier
  Sincere “yeah right”: 22% with laughter
  Sarcastic “yeah right”: 73% with laughter

✓ No confirmation that men use sarcasm more often than women does
Table 2. Classification results, sorted by feature set.
Questions they wanted to answer...

✓ Best feature to detect sarcasm

What types of features are most indicative of sarcasm’s presence?
- Ignore prosodic features, focus on contextual features

✓ Formulation

How sarcasm functions as a speech act?
- Couldn’t find the answer...

✓ Recommend suitable followup action

How should a dialogue manager respond to sarcasm once detected?
- Either generate synthetic laughter or point out that it gets the joke