



Study of Rumors on Twitter

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Introduction

❖ Rumor - a message whose truthfulness is unverifiable. I have two projects on rumors.

❖ **Attitude classification** = sentiment polarity + target. E.g., in "I support Obama", the speaker has positive attitude towards target Obama.

Example	Sentiment	Attitude
I support Obama.	✓	✓
A sad event happened at Obama's speech.	✓	✗
@BarackObama I'm so happy today.	✓	✗
Obama is re-elected.	✗	✗

❖ **Rumor diffusion.** How could rumor and debunk interact with each other when they are spreading simultaneously?

Motivation

❖ Rumor could change people's attitude ⇒ attitude classification might in turn help detect rumors.



❖ What's the differences between people who change attitude frequently and people who don't?

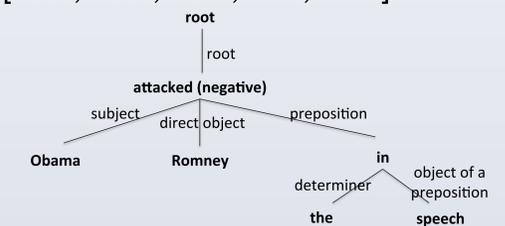
Attitude Classification

Method

- ❖ **Content-specific features**
 - ❖ Unigrams
 - ❖ Bigrams
- ❖ **Simple NLP features**
 - ❖ Part-of-speech in context window
 - ❖ Lexicon in context window
- ❖ **Parsing**
 - ❖ Dependency tree
- ❖ **Network**
 - ❖ User A follows user B
 - ❖ User A mentions user B

Example

- ❖ **Obama attacked Romney in the debate.**
- ❖ Part of speech for window size of 5: [NULL, NULL, Noun, Verb, Noun]



- ❖ Path from target to root: [target, subject, negative, root]

Rumor Diffusion

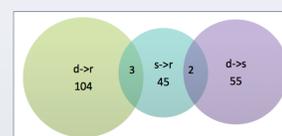
Motivation

- ❖ In the traditional epidemic model [1], treatment cannot spread. If we make an analog:
 - ❖ Disease ⇔ Rumor
 - ❖ Treatment ⇔ Debunk
- ❖ Problem: how to model the diffusion of disease when treatment is spreadable?

A Case Study

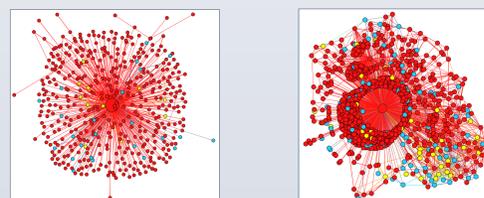
- ❖ Background. A hacker posted a tweet using news agency AP's account: Two Explosions in the White House and Barack Obama is injured. 2 minutes later, an AP's employee posted: Please Ignore AP Tweet on explosions, we've been hacked.

209 users retweeted tweets NOT in the order of "rumor, suspicion, and debunk"



Visualization of the Diffusion

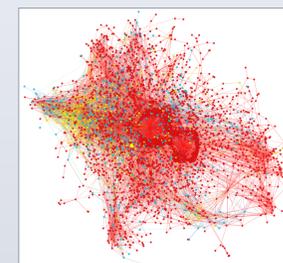
Red - Rumor; Yellow - Debunk; Blue - Suspicion.



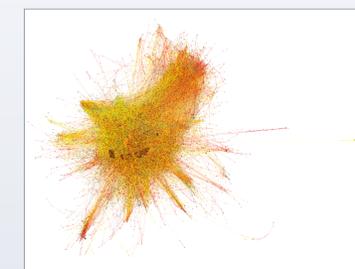
60 and 120 seconds after posting of the first rumor.



2 seconds after the official debunk. 134 seconds after the first rumor.



192 seconds after posting of the first rumor.



3 hours later after the first rumor. Diffusion network is close to completion.

References

- [1] Kermack, W. O.; McKendrick, A. G. (1927). "A Contribution to the Mathematical Theory of Epidemics". Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences 115 (772): 700.