Case Study:
Finding Question Topics Over Time On Twitter

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Context

- Social Media services.
  - Connect & generate interaction.

- Q&A: People ask questions and get answers.
Q&A: Yahoo Answers!

How to send an email from my Facebook to a friend's email@privateemail.com address?
I cannot for the life of me figure out how to send a message/email to my friend FROM FACEBOOK itself. He is not on Facebook. And I don’t use my old email...
asked by inquisitor in Facebook 2 mins ago

Need help too connect wireless router to old pack bell windows 98 pc?
asked by Herman C in Computer Networking 3 mins ago

What is the best free anti-virus program? (3 Answers)
asked by Chillwind Yeti in Software 4 mins ago

I am having a lot of Firefox issues. Help?
This is the 3rd question I’ve had to ask because I updated my web browser to Firefox 26. I regret ever making the update...
asked by William in Other - Internet 5 mins ago

Internet Explorer Error Message :Stopped working?
Since 1/13/14, Internet Explorer 9 keeps showing me this message: "Internet Explorer has stopped..."
asked by hung in Other - Internet 6 mins ago

I got 2 cannon Vixia hf r40 and would like to use software and my Laptop to broadcast and record church?
I have a Lenovo s400 running windows 8.1 and ASUS running windows 8 and trying to record our church service need too know what is the a...
Questions on Twitter?

- Why do people ask questions in Twitter?
- Not have Q&A features.
- Uncomfortable.
- **People still asking questions!**
Why do you ask in Twitter?

- People found a fast way to satisfy information needs.
- 1 of 10 tweets are questions.
  - [Efron et al, 2010, Li et al, 2011]
Periodicity and Question Topic

09.30 – 10:00: 
Barcelona new coach

13:00 – 13:30: 
Lunch
Research Questions

- Understand questions during the day?
- Find question topics?
- Question topics have periodic behavior?
- Questions in certain events?

Day hours

09.30 – 10:00: Barcelona new coach
13:00 – 13:30: Lunch
Motivations

• Anticipate questions.
  o News related sites.
  o Opportunities to business provides and advertisers.

• Duration of question topics.
  o Crisis events → Authority decisions.

• Detect time sensitive patterns.
  o The same word has a different meaning in different times.
Related Work

Topics

- Topics in Twitter vs Newspaper. [Zhao et al, 2011]
- Topics interest of user. [Michelson et al, 2010]

Time Sensitive

- Modelating temporal trends.
  [Yang et al, 2014; Yang et al, 2011; Yang et al, 2013]
- Bursty topics over time. [Quiming et al, 2012]
Case Study: Experiment Steps

1. Collect a questions dataset $\Rightarrow \ ?$
   - Twitter API.
   - Two weeks of August 2013.
   - ~100,000 question tweets (US).

2. Interval analysis.
   - [Interval 1]: 00.00 – 05.59
   - [Interval 2]: 06.00 – 11.59
   - [Interval 3]: 12.00 – 17.59
   - [Interval 4]: 18.00 – 23.55

3. Filter question with replies.
Case Study: Experiment

Clustering
- K-means,
- TF (Term Frequency).

✓ Question Topics
✓ Periodicity.
Results

Periodic Behavior

- “Breaking bad” TV series
- Weekend
- Recommendation

Lessons learned:

- It is possible!
- More data.
- **Automatically detect question topics.**
Future Work: Detect Question Topics

Topic A

Topic B

Topic A

Topic C

……

Future Work: Detect Question Topics

Topic B

Topic C

Topic A

……

Topic n

ΔT
Future Work: Detect Question Topics

- Topic Models.
  - [Blei et al, 2003]
  - LDA - Latent Dirichlet Allocation -
  - Statistical method that determines $k$ topics that represent a document.
Future Work: Detect Question Topics

- Question tweets are short!

umented with actual Twitter posts.}

✔ Answers can provide useful information.

✗ API can not provide answers.
Future Work and Comments

• The result are novel and promising.
  o Questions exhibit periodicity patterns in streaming.

• Calibrate time intervals.

• Download Answers.
  o Semantic Analysis.

• Topic models:
  o Find the best topic model for streaming text.

• Expand research: Expertise, discussion, routing.
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