# The Velocity of Censorship: High-Fidelity Detection of Microblog Post Deletions

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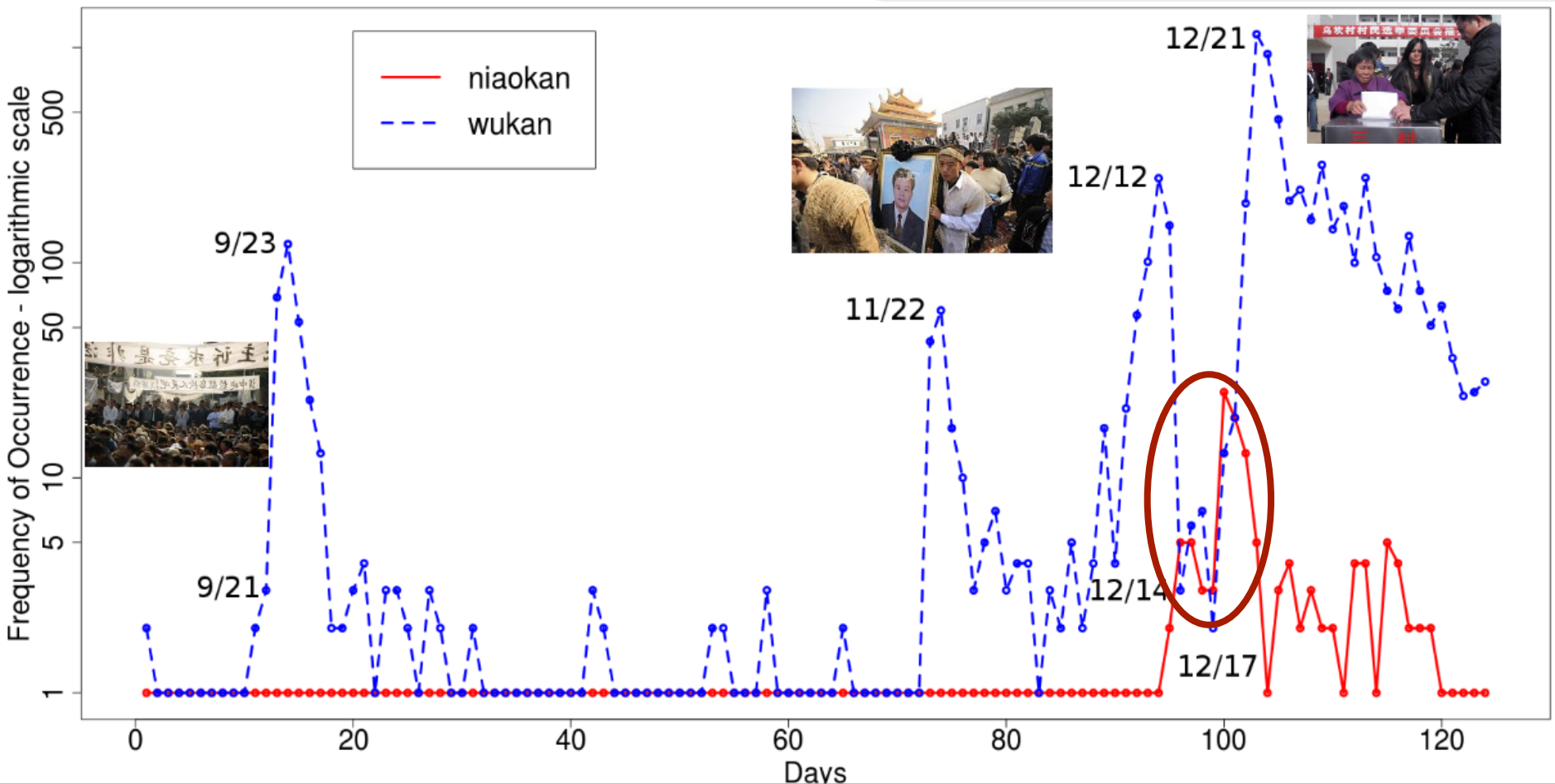# Microblogging sites in China

March 2006       July 2009       August 2009

# Sina Weibo

- 503 million registered users as of Dec 2012.
  - More than half are from mobile devices.

- About 100 million messages are posted each day on Sina Weibo.

- Promote visibility of social issues.

# Weibo's influence: Wukan incident - 2011



乌坎 (The village name) vs 鸟坎 (Neologism)

# Sina Weibo

- Strict controls over the posts.

# Introduction of our research

- Detecting a censorship event within 1-2 minutes of its occurrence.

- Three strategies Weibo system uses to target sensitive content quickly.

# Methodology

1. Identifying the sensitive user group

2. Crawling posts of sensitive user groups

3. Detecting deletions

# Identifying the sensitive user group

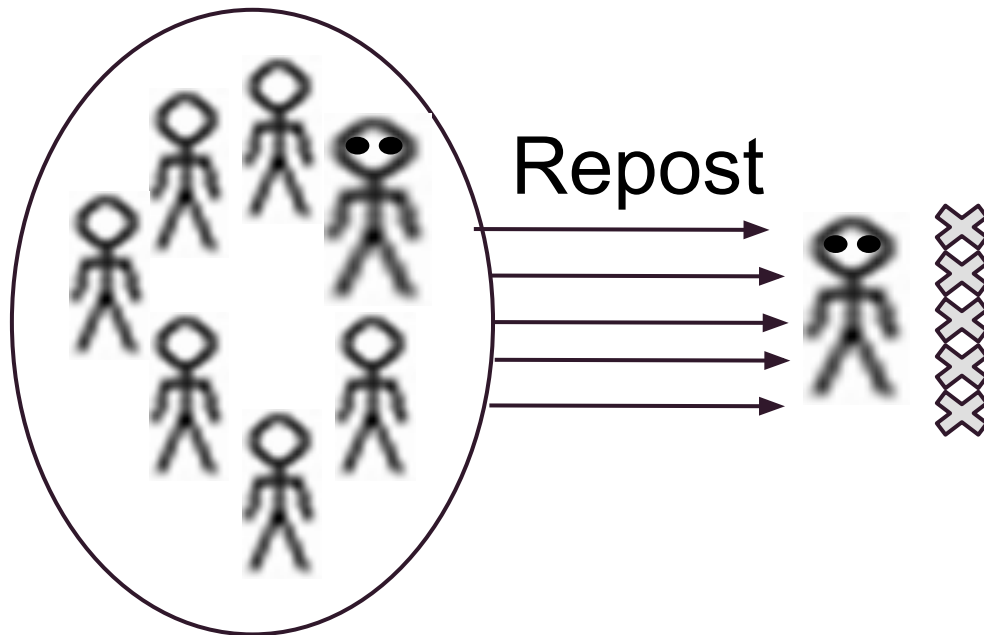- Use outdated sensitive keywords from China Digital Times

| 敏感词 | Sensitive Word | CDT English Post | 第一次测试日期/结果 Date/Result of Test 1 | | 第二次测试日期/结果 Date/Result of Test 2 | 第三次测试日期/结果 Date/Result of Test 3 | 第四次测试日期 Date/Result of T |
|---|---|---|---|---|---|---|---|
| 薄+刘 | Bo+Liu | http://goo.gl/xxKoSY | 2013.7.25 | 1 | | | |
| 薄+死 | Bo+death | http://goo.gl/xxKoSY | 2013.7.25 | 1 | | | |
| 薄+保外就医 | Bo+medical parole | http://goo.gl/xxKoSY | 2013.7.25 | 1 | | | |
| 薄+（周）永康 | Bo+(Zhou) Yongkang | http://goo.gl/xxKoSY | 2013.7.25 | 1 | | | |
| 薄王 | Bo Wang | http://goo.gl/xxKoSY | 2013.7.25 | 1 | | | |
| 薄胡 | Bo Hu | http://goo.gl/xxKoSY | 2013.7.25 | 1 | | | |
| 五个重庆 | Five Chongqings | http://goo.gl/xxKoSY | 2013.7.25 | 1 | | | |
| 党内斗争 | internal Party struggle | http://goo.gl/xxKoSY | 2013.7.25 | 1 | | | |
| 挺薄 | support Bo | http://goo.gl/xxKoSY | 2013.7.25 | 1 | | | |
| 薄公 | Master Bo | http://goo.gl/xxKoSY | 2013.7.25 | 1 | | | |
| 怀念+薄 | think fondly of+Bo | http://goo.gl/xxKoSY | 2013.7.25 | 1 | | | |
| 南华（早报）+马云 | South China (Morning Post)+Jack Ma | http://goo.gl/mm0Ja | 2013.7.20 | 1 | | | |

# Identifying the sensitive user group

- Identifying the sensitive user group
  - Use outdated sensitive keywords from China Digital Times.
  - Start with 25 sensitive users.

# Identifying the sensitive user group

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  - Use outdated sensitive keywords from China Digital Times.
  - Start with 25 sensitive users.
  - Sensitive group reaches 3,567 users after 15 days.
  - More than 4,500 deletion daily

# Crawling

- ## User timeline:
  - Weibo user timeline API returns the most recent 50 posts of the specified user.

  - Query 3,567 sensitive users once per minute
    - 100 accounts for API call
    - 300 concurrent Tor circuits.

  - Four-node cluster running Hadoop and Hbase
    - 2.38 million posts from July 20 to September 8, 2012.

# Detecting deletions
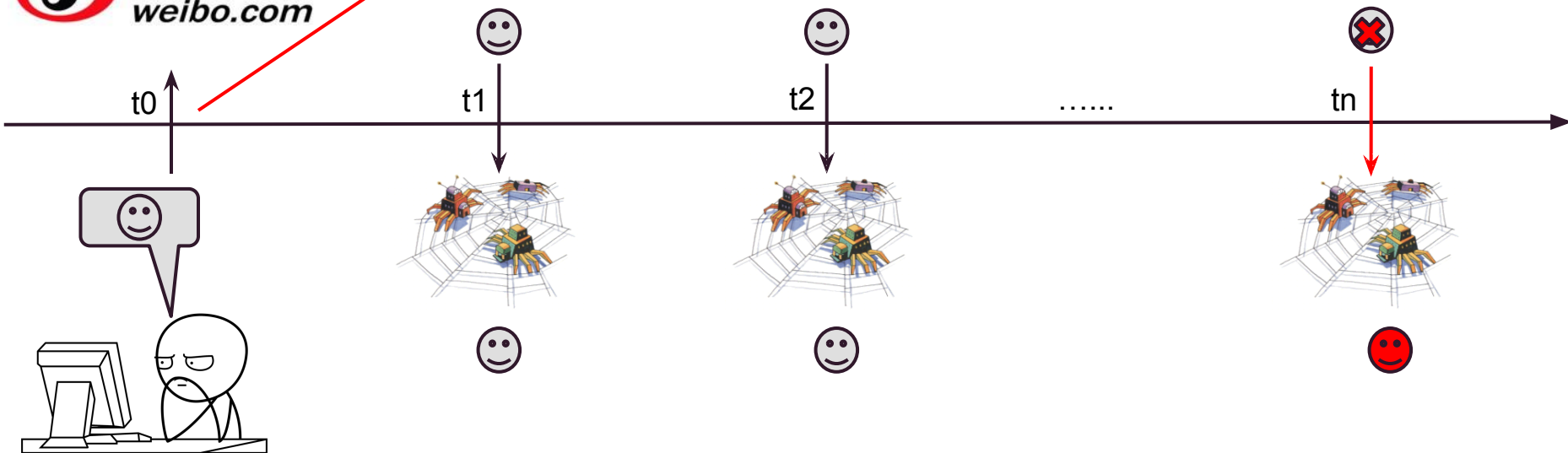
Latest 50 posts       Our database       **Deleted Post**

Diff

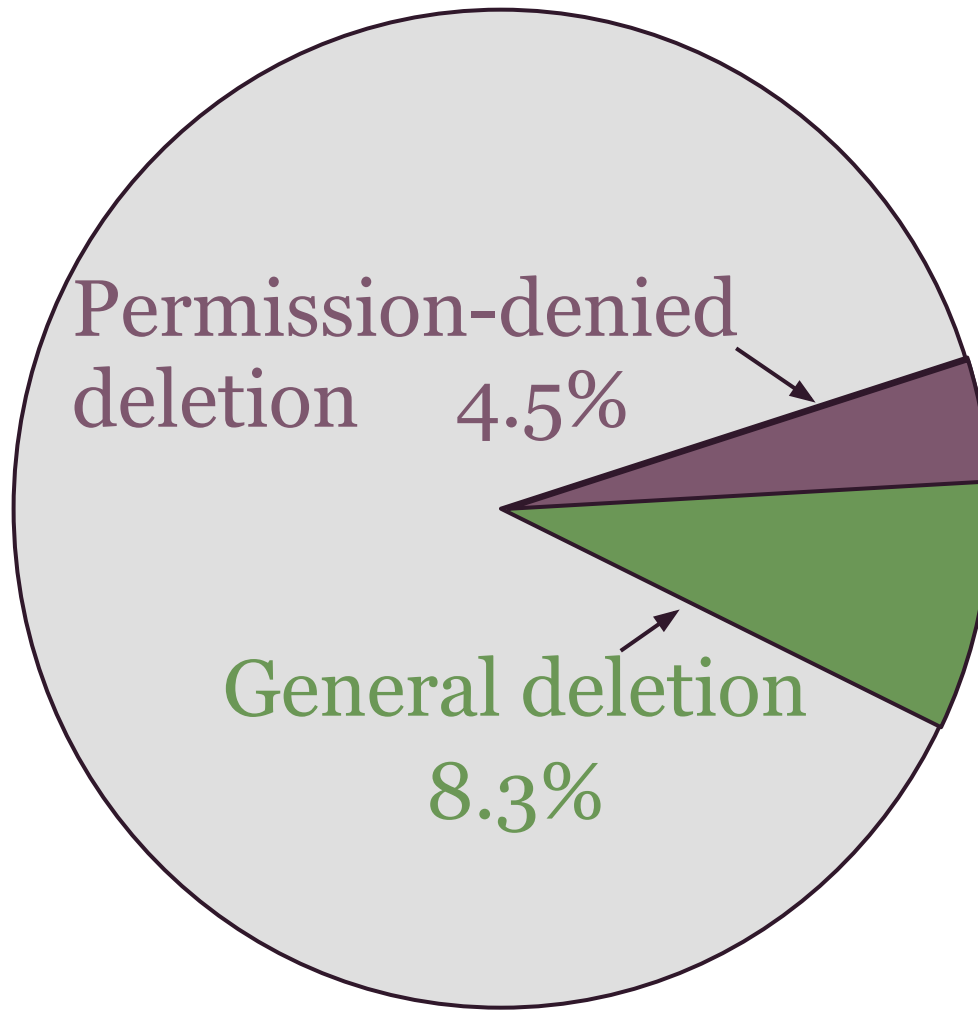# Detecting deletions

The lifetime of deleted Post = tn - t0

# Detecting deletions

- Permission-denied or system deletion
  - "Permission denied" error.
  - Caused by censorship events.
  - The post still exists but cannot be accessed by users.

- General deletion
  - "Post does not exist" error.
  - May caused by user self deletion or censorship events.
  - The post does not exist.

# Detecting deletions

2.38 Million user timeline posts

Permission-denied deletion    4.5%

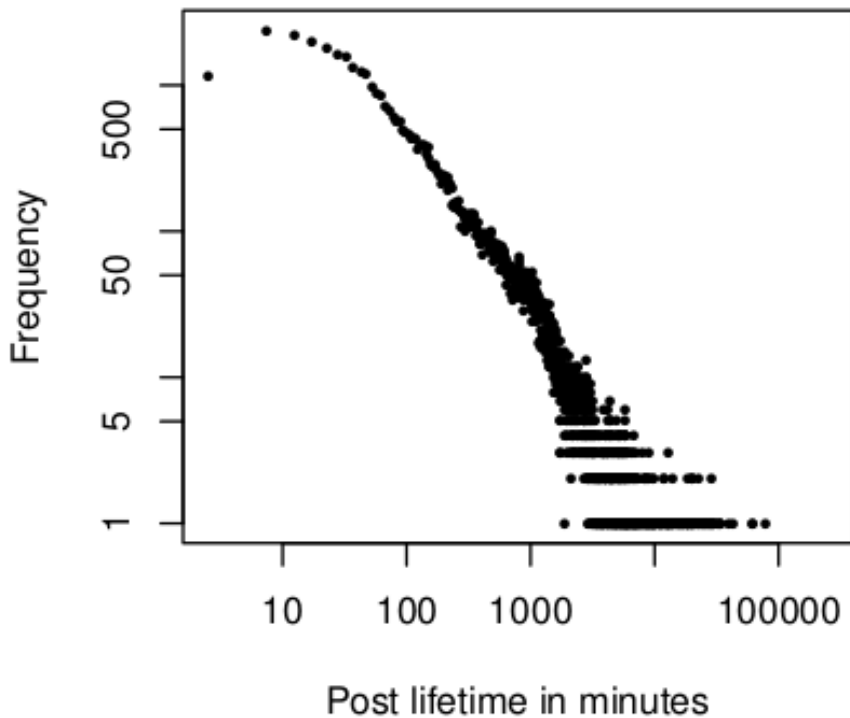General deletion 8.3%
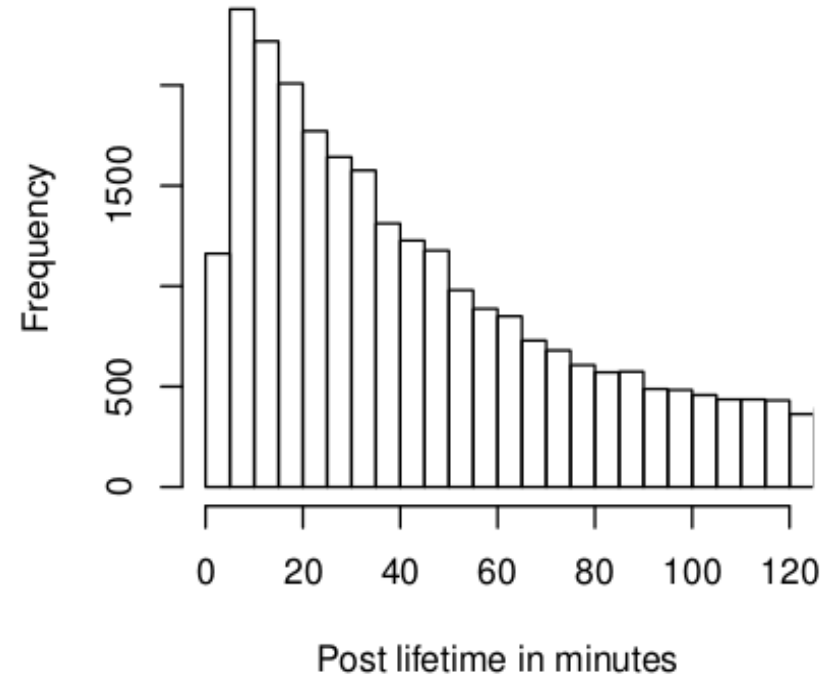
# Detecting deletions

- <u>Permission-denied deletion or system deletion</u>

    - Around 1,500 permission denied deletions.

    - Comparing with WeiboScope, which is tracking around 300,000 users and have no more than 100 permission denied deletions daily.

# Distribution of deleted posts

## Whole lifetime



## First two hours

# Strategies to target sensitive contents

1. Weibo has filtering mechanisms as a proactive, automated defense.

2. Weibo targets specific users, such as those who frequently post sensitive content.

3. When a sensitive post is found, a moderator will use automated searching tools to find all of its related reposts, and delete them all at once.

# 1. Keywords list filtering

- Weibo has filtering mechanisms as a proactive, automated defense
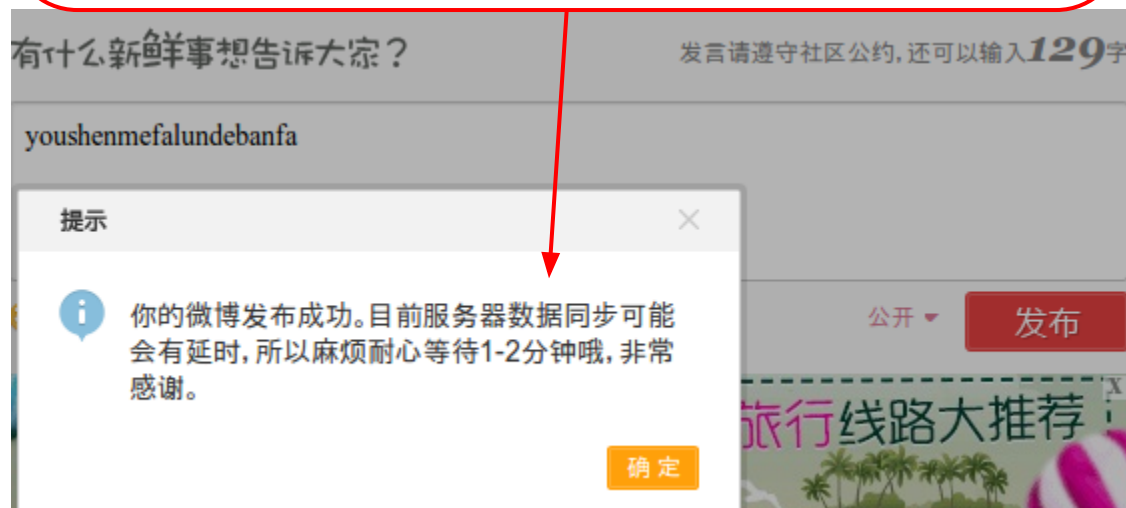
  ○ Explicit filtering

Sorry, The content violates the relevant laws and regulations. If need help, please contact customer service.

有什么新鲜事想告诉大家？

可以直接输入音乐或视频的url地址

发言请遵守社区公约，还可以

政法委书记

😊 表情

提示

×

ⓘ 抱歉，此内容违反了《新浪微博社区管理规定(试行)》或相关法规政策，无法进行指定操作。如需帮助，请联系客服。

确定

# 1. Keywords list filtering

- Weibo has filtering mechanisms as a proactive, automated defense

  - Explicit filtering
  - Implicit filtering

Your post has been submitted successfully. Currently, there is a delay caused by server data synchronization. Please wait for 1 to 2 minutes. Thank you very much.

有什么新鲜事想告诉大家？

发言请遵守社区公约，还可以输入 **129** 字

youshenmefalundebanfa

提示

你的微博发布成功。目前服务器数据同步可能会有延时，所以麻烦耐心等待1-2分钟哦，非常感谢。

公开

发布

确定

旅行线路大推荐
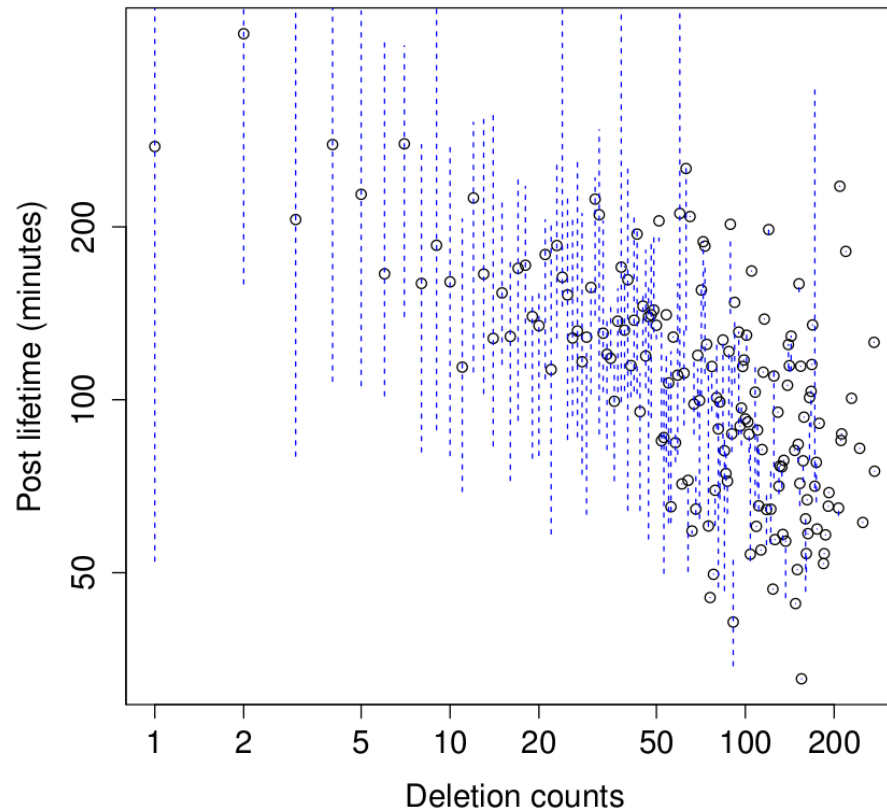
# 1. Keywords list filtering

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  - Camouflaged posts

# 1. Keywords list filtering

- Weibo has filtering mechanisms as a proactive, automated defense

  - Explicit filtering
  - Implicit filtering
  - Camouflaged posts
  - Surveillance keywords list ?
    - If no such list the cost will be too expansive
      - Suppose to censor 70,000 new posts in one minute, it needs 1400 simultaneous workers (50 posts per minutes per worker).
      - Assuming 8 hour shift, 4200 works is required.
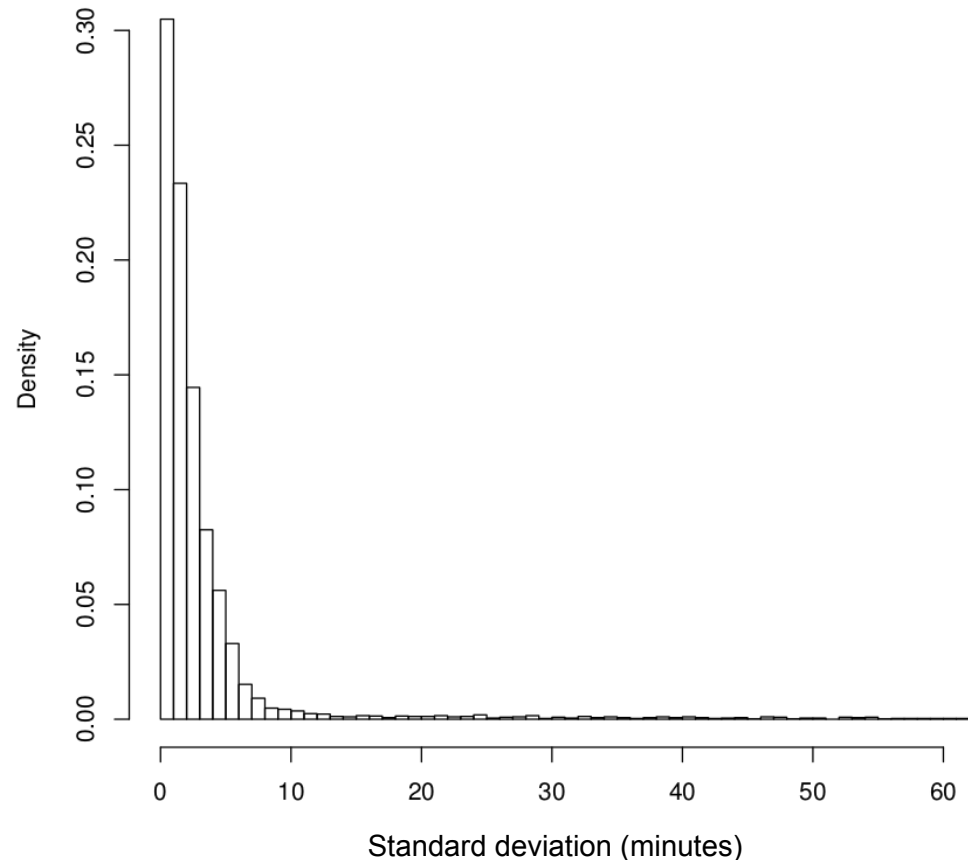      - It is not cost efficient

# 2. Targeting specific users

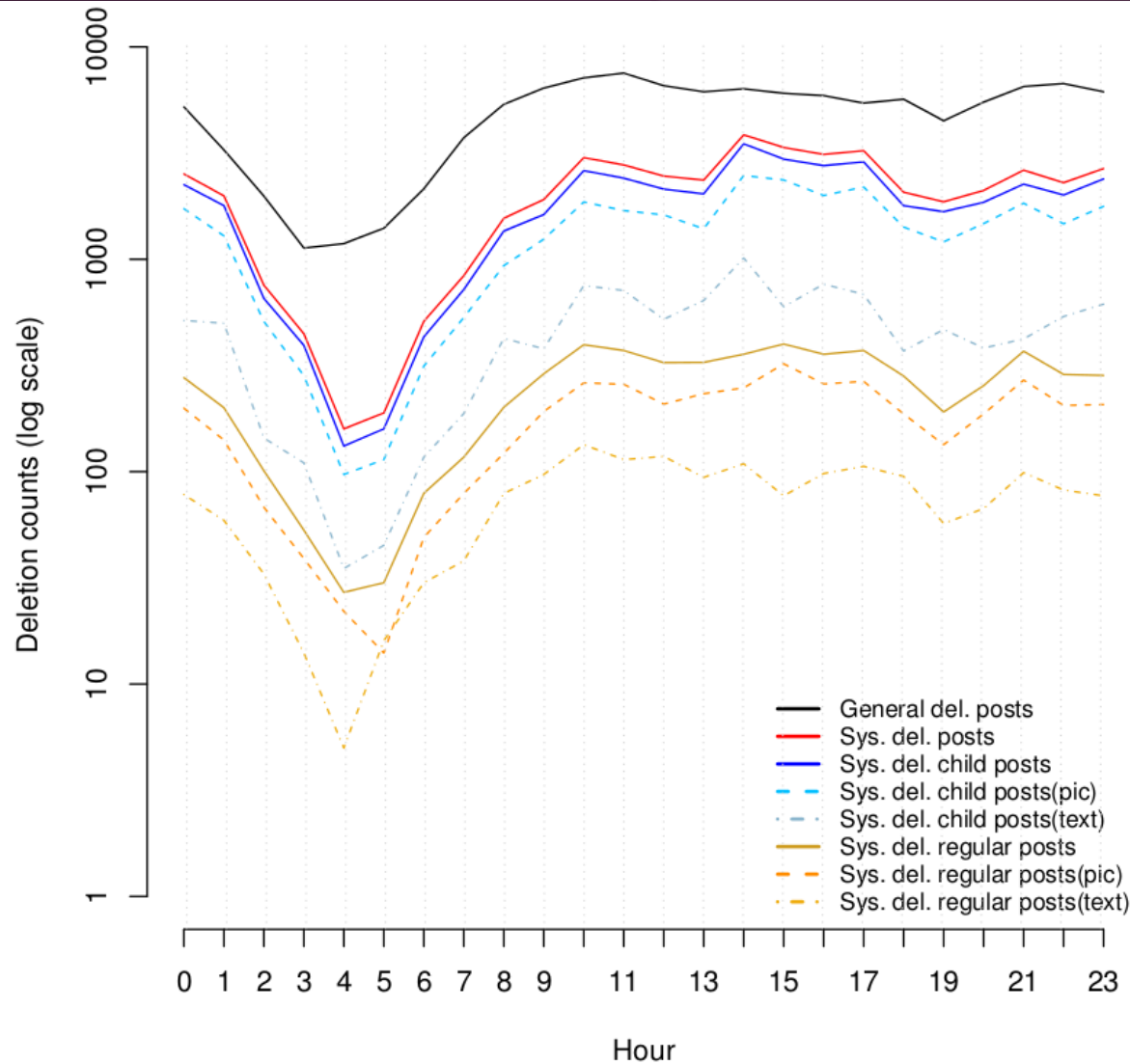- Weibo targets specific users, such as those who frequently post sensitive content.

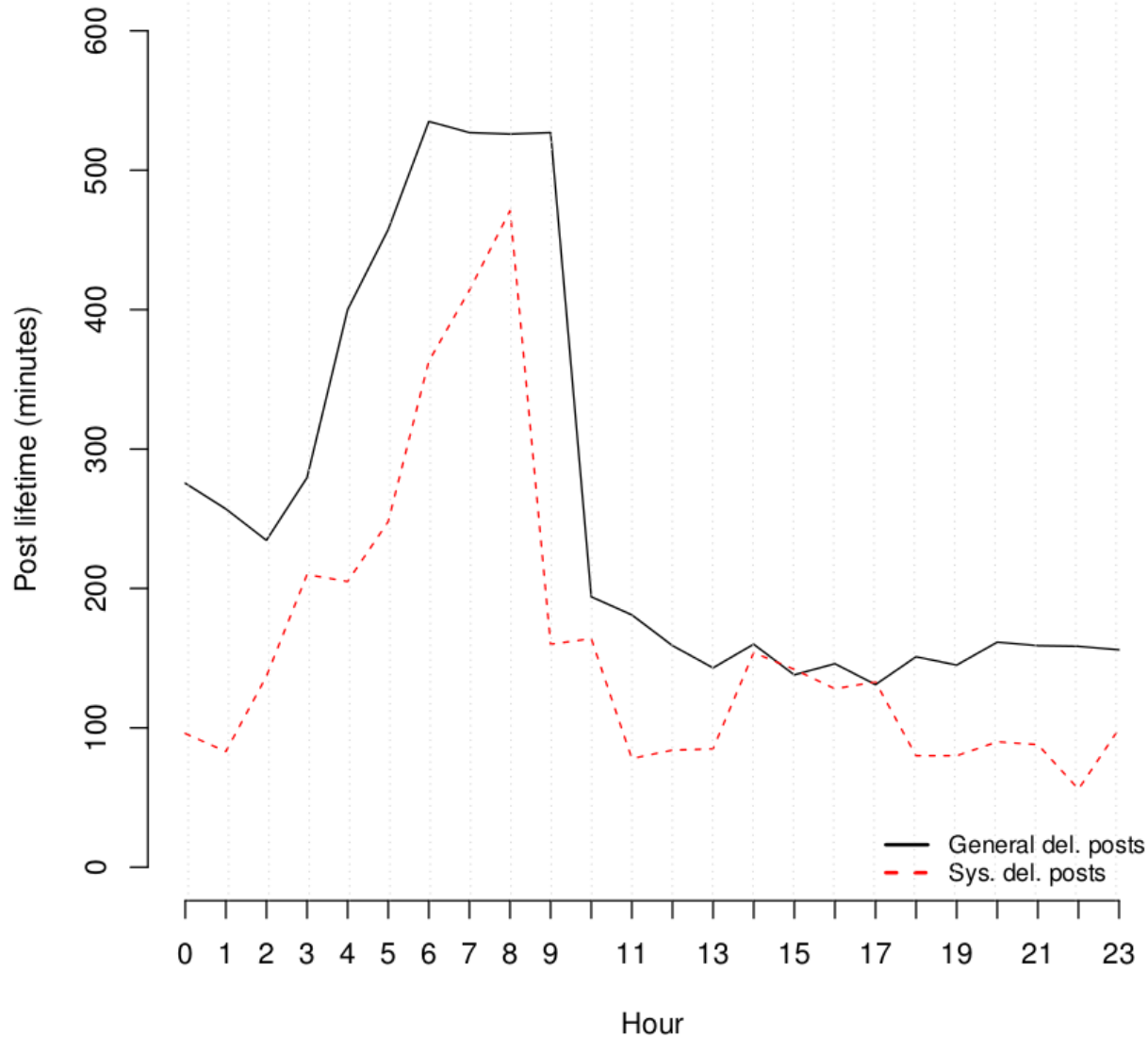# 3. Finding all related reposts

- When a sensitive post is found, a moderator can find all of its related reposts, and delete them all at once
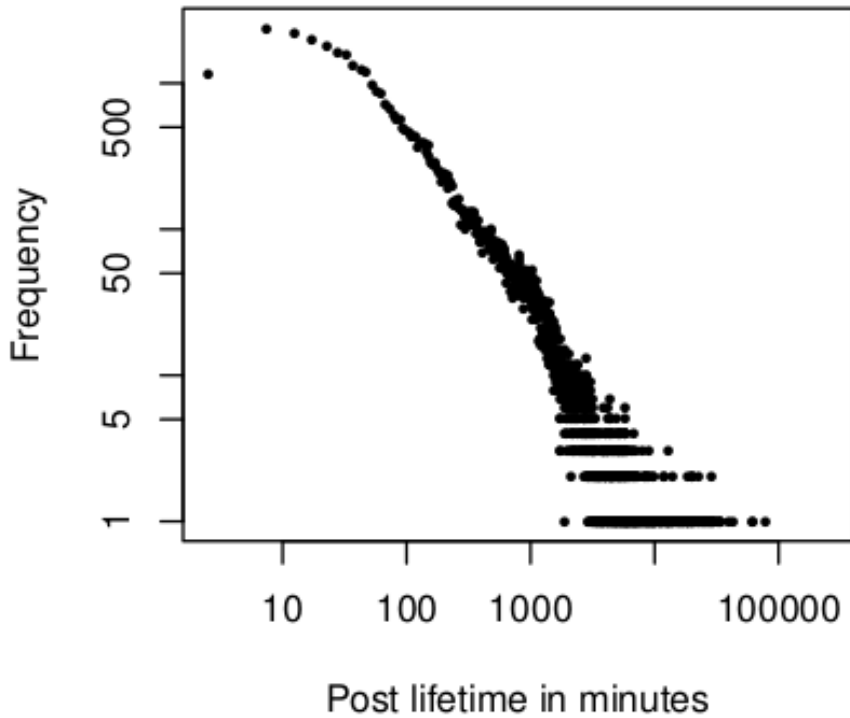
# Censors work in the night
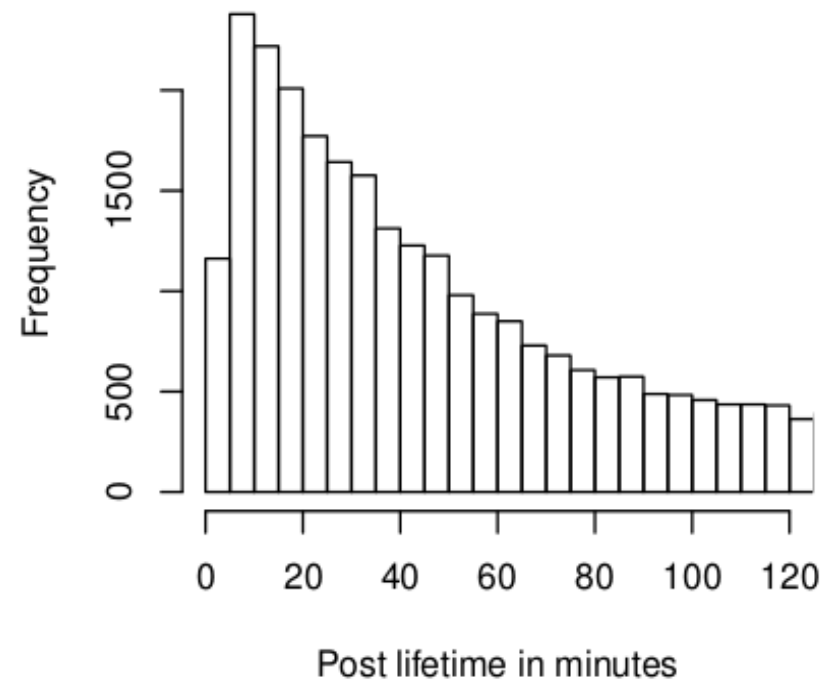
# Censors catch up on overnight posts by late morning

# Conclusion

Whole lifetime

First two hours

# Thank you!

Q & A