SocialQuake
Earthquake Detector

Tyler Roach
Brett Guiden
George Tattersall
Mentor: David Nemer
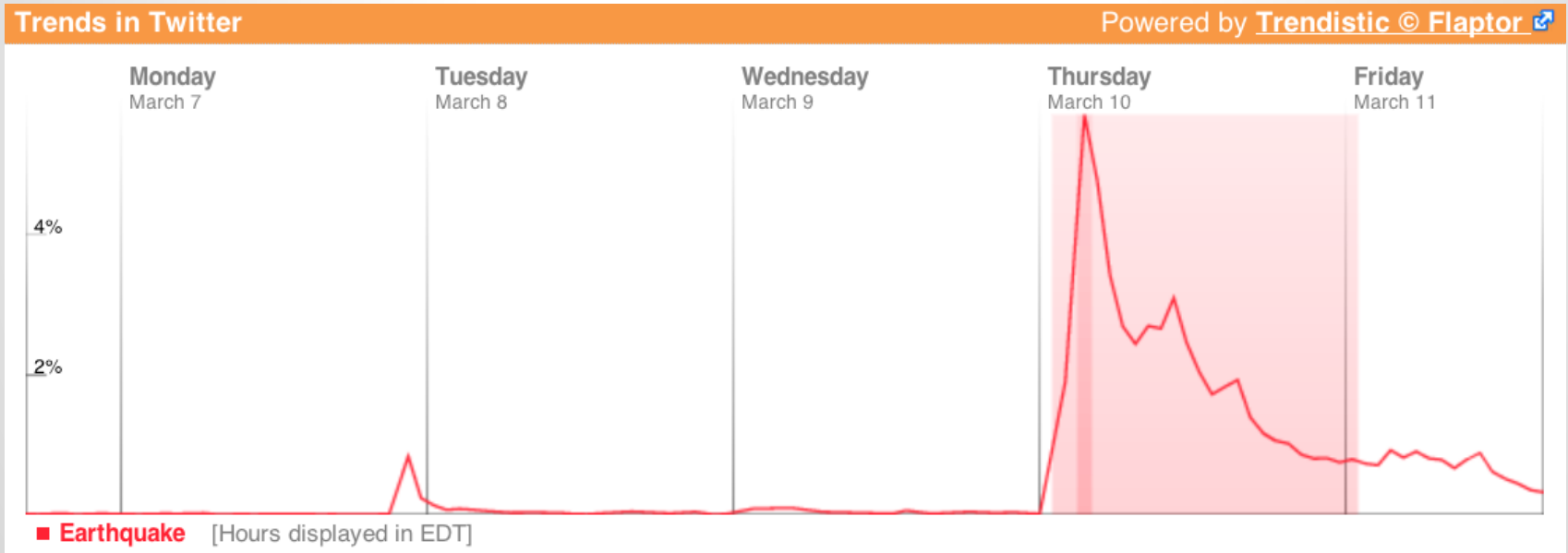
A Quick Intro

Hypothesis Question:

How many relevant tweets are needed to successfully sense that an earthquake has occurred? Is this process faster than how quickly scientific organizations release their findings?

3 Sources of data:

Past (Social), Present (Social), Present (Scientific)

Past Social Data

Historically twitter activity responds to earthquakes.

Video

- M6.6 - Manokwari,
01:16:54 UTC. 84km
kwari,...

ere may be a earthquake
ie) which will happen in the
ia to be flooded.

5.9 earthquake, near the
ndonesia. Apr 21 10:16am

apan

ido, Japan region. Apr 21
(15m ago, 95km SE of
. http://t.co/2XckB8Fj"

Boo: In friendship and
ed by the earthquake and
http://t.co/8378ZTdp

Tweets Each Hour (UTC time):

00:00 --- 622
01:00 --- 914
02:00 --- 507
03:00 --- 430
04:00 --- 403
05:00 --- 452
06:00 --- 313
07:00 --- 708
08:00 --- 673
09:00 --- 625
10:00 --- 1238
11:00 --- 474
12:00 --- 449
13:00 --- 496
14:00 --- 289
15:00 --- 297
16:00 --- 502
17:00 --- 277
18:00 --- 545
19:00 --- 387
20:00 --- 422
21:00 --- 467
22:00 --- 501
23:00 --- 557

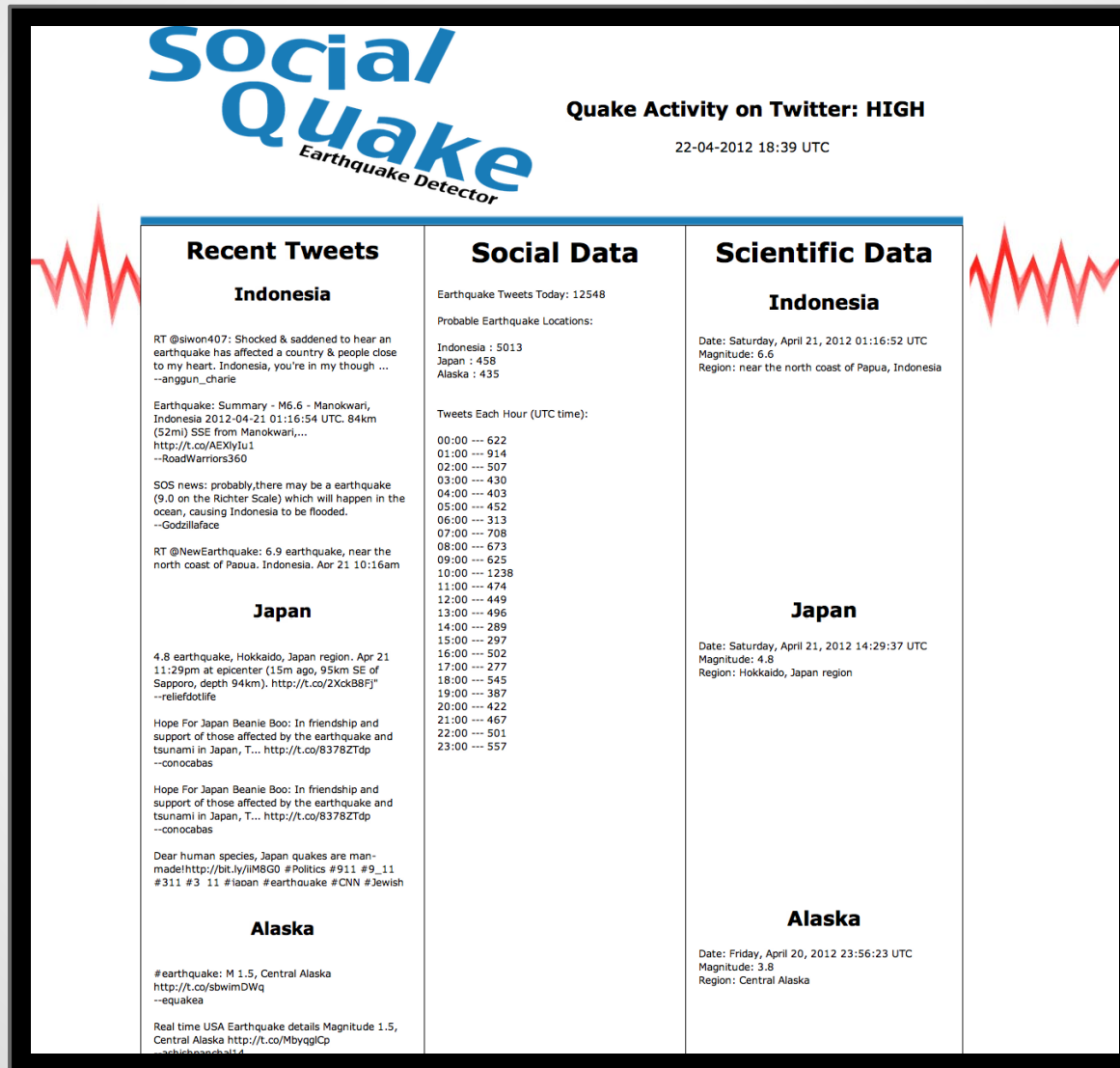Date: Saturda
Magnitude: 4.
Region: Hokka

Social Quake Website

- Provides scientific data by using a CSV feed provided by USGS.

Provides the social data determined from the Social Quake script.

- Provides current EQ-related tweets organized by the top three most active regions.

What We Created

How social quake works

1. We gather all earthquake related tweets through TweetStream in real time.

2. Filter out common words such as titles of songs with earthquake in them.

3. Relevant tweets get added to an hourly total of mentions. If a city/state/geolocation is mentioned in a tweet then we also record its location.

How social quake works

4. If an hourly total is larger than expected then we consider an EQ to have occurred.

5. The social data is uploaded to SocialQuake's website in real time.

Methods Used

- Tweetstream + Python + Php
- Gathered common tweets relating to earthquakes
- Filtered out unrelated earthquake words
- Created a counter to measure the amount of Tweets per hour and per day
- Analyzed tweets to find mentioned location
- Built a scale to define quake activity that is based on a grounded theory approach (Glaser Strauss 1967)

Results

- Determined when and where an earthquake occurs through social data.

- Social data was able to report the location of an earthquake that confirmed scientific data, sometimes before scientific data from USGS was released

Conclusion and Future Work

Conclusions

- Created a functioning website that determines location and time of an earthquake, displays top 3 earthquakes each day, and relevant tweets for the data.

- Gathered common earthquake tweets in one central location

Conclusion and Future Work

Future Work

- Should look at the correlation between tweet mentions and the magnitude of the earthquake being talked about.

- At what point in strength on the Richter scale do people start to tweet about the earthquake in significant numbers?

- Should we not mention earthquakes in our scientific data if it doesn't meet that threshold?

Questions?

Comments?