Identifying Topically Relevant Social Media: Where Sampling Meets User Cognition

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http://www.public.asu.edu/~mdechoud/
Modern Social Interactional Modes

Facebook

Slashdot

Engadget

Digg

LiveJournal

Twitter

MetaFilter

Reddit

Blogger

Orkut

MySpace

YouTube
Viral Marketing, Advertising Campaigns
Collaboration, “Wisdom of the Crowds”
Crisis management w.r.t. real-time events
Facebook hits milestone: Half a billion users

Social networking site marks occasion with new Facebook Stories app, interview with Diane Sawyer

By Sharon Gaudin

July 21, 2010 02:29 PM ET

"Too-much-information" Syndrome!
By April 2010, http://www.twitter.com/ was receiving over 600 million search queries per day (Huffington Post).
“Information overload” problem – *Get me the right content!*
How do we identify the most “relevant” or “best” items on a topic, from millions and even billions of units of social media content?
Unidimensional information presentation; but social media information is diverse.

- **Shannon-Nyquist sampling theorem:** “If a function \( x(t) \) contains no frequencies higher than \( B \) hertz, it is completely determined by giving its ordinates at a series of points spaced \( 1/(2B) \) seconds apart.”
- **Doesn’t hold true for social media – cognitive mechanisms of information consumption.**
Characteristics of social media – high dimensionality

User cognition – mechanisms of human information processing

Information Diversity
Characteristics of social media – high dimensionality

User cognition – mechanisms of human information processing

Homogeneous information

A specified diversity parameter

Heterogeneous information

[Simon 1971, Zaichkowsky 1985, Jost 2006]

Information Diversity

least entropy of tweets in a sample

maximum entropy of tweets in a sample

Engagement
Memory encoding
Interestingness
Informativeness

Main Idea...
Dimensional Importance

- Survey based feedback on the importance of different dimensions – referred to as “concentration parameters”.
  - Participants (11 ‘active’ Twitter users) were requested to rate each of the tweet dimensions on a scale of 1 through 7, where 1 implied “not important at all”, and 7 meant “highly important”.
  - The survey also allowed them to identify other dimensions that they might think to be significant.
Social media sampling

• Our solution is motivated by the work in the signal processing literature on “compressive sensing” [Candes 2008]:
  – Social media content over time can be considered as signals that often bear the property of being highly “sparse” [Romberg 2008].
  – Compressive sensing can be used to exploit this notion of sparsity in social media content based signals to describe it (i.e. a tweet stream) as a linear combination of a very small number of basis components.

• Given \( \Psi \in \mathbb{R}^{N \times K} \), we are interested in the “underdetermined” case \( M << N \), \( M \) is the number of basis functions whose coefficients can reconstruct \( \Psi \).
  – Formally, our goal is to find \( \Psi_S \in \mathbb{R}^{M \times K} \), i.e. the general problem of reconstructing \( \Psi \in \mathbb{R}^{N \times K} \) from linear measurements \( \Psi_S \) about \( \Psi \) of the form: \( \Psi_S = \Phi \Psi \), \( \Phi \) is the transformation matrix.
We utilize the popular wavelet transform, called “Haar wavelet” for reconstruction of $\Phi$.

Given $\Psi \in \mathbb{R}^{N \times K}$, a tweet $t_i \in \Psi$ can be written as $t_i = \Lambda^* f$, $\Lambda$ is the $N \times N$ matrix, $\Lambda^*$ is the orthonormal basis.

- Hence $t_{iS} = \Phi f$ or $t_{iS} = \Phi' t_i$, where $\Phi' = \Phi \Lambda^*$.
- We could recover $f$ by finding among all coefficients consistent with the data $\Psi$, the decomposition with minimum $L_1$-norm:

$$\min \| t_i \|_{L_1}, \text{s.t. } \Phi' t_i = t_{iS}.$$
Social media sampling (contd.)

• We perform iterative clustering of tweet sample generation – based on entropy distortion minimization technique.
  – The samples are constructed given a sampling ratio $\rho$ and a diversity parameter value $\omega$.
  – The (sub)-optimal sample to be constructed is represented as, $\Psi_S^*(\rho, \omega)$.

• Start with a random tweet as a sample seed.

• Iteratively keep on adding tweets from $\Psi_S$, say $t_i$, such that the distortion (in terms of $L_1$-norm) of entropy of the sample (say, $\Psi_S(i, \omega)$) on addition of the tweet $t_i$ is least with respect to the specified diversity measure $\omega$.

\[
\arg\min_{t_i \in \Psi_S, t_i \notin \Psi_S(i-1, \omega)} \left\| H_O(\Psi_S(i, \omega)) - \omega \right\|_{L_1}, \text{ where }
\]

\[
H_O(\Psi_S(i, \omega)) = -\sum_{k=1}^{K} P(\bar{t}_{ik}).\log P(\bar{t}_{ik}) / H_{\max}, \ t_i \in \Psi_S \text{ and } H_{\max} = \ln K.
\]
Sample ordering

- We present a simple entropy distortion based ordering technique of the tweets in the (sub) optimal sample $\Psi^*_S(\rho, \omega)$.
  - Our central intuition is that the ordering should be based on how close a particular tweet $t_i \in \Psi^*_S(\rho, \omega)$ is, in terms of its different sampling dimensions $K$, with respect to the specified diversity parameter $\omega$.
  - Hence compute the entropy distortion:
    $$\min_{t_i} \left\| H_o(\Psi^*_S(i, \omega)) - \omega \right\|_{L^1}$$
  - The lower the distortion, the higher is the “rank” / “position” of the tweet in the ordered sample.
How does this method compare to state-of-the-art techniques?

Twitter, full fire-hose, June 2010, total 1.4 Billion tweets, 55 Million per day.
Qualitative evaluation

<table>
<thead>
<tr>
<th>User</th>
<th>Tweet Description</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>@Paramedic_Fla</td>
<td>Some oil spill events from Monday, June 7, 2010: [link]</td>
<td>[link]</td>
</tr>
<tr>
<td>@miamiauto</td>
<td>Some oil spill events from Monday, June 7, 2010: A summary of events on Monday, June 7, Day 48 of the Gulf of Mexi... [link]</td>
<td>[link]</td>
</tr>
<tr>
<td>@franklanguage</td>
<td>RT @DAYLEE F@CK that! Broken pipe is not NATURAL! RT @RayBeckermanFreedomWorks CEO, Calls Oil Spill Natural Disaster [link]</td>
<td>[link]</td>
</tr>
<tr>
<td>@Teasdallqrb</td>
<td>Public offers ‘helpful’ ideas on containing BP oil spill - NEWS.com.au</td>
<td>[link]</td>
</tr>
<tr>
<td>@_paigenesss</td>
<td>RT @TEDchris: A Gulf oil spill picture I will never forget. [link]</td>
<td>[link]</td>
</tr>
<tr>
<td>@LeiaOfAlderaan</td>
<td>Citizen Speaks The Truth ON BP Gulf Oil Spill--the Govt, BP Are Doing Nothing, There Are No Leaders Here [link]</td>
<td>[link]</td>
</tr>
<tr>
<td>@Faustinagwlxo</td>
<td>WOOW! NO WAY! so brutal! [link] Movie Summer Jam WWDC Oil Spill Xtina Another Cinderella Story</td>
<td>[link]</td>
</tr>
<tr>
<td>@minxdeluxe</td>
<td>RT @OliBarrett: Visualizing the BP Oil Spill [link]</td>
<td>[link]</td>
</tr>
</tbody>
</table>

[Twitter search-alike] Most Recent tweets

<table>
<thead>
<tr>
<th>User</th>
<th>Tweet Description</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>@JosephAGallant</td>
<td>Erin Brockovich to meet with fishermen who say oil spill dispersant used by BP made them sick. [link]</td>
<td>[link]</td>
</tr>
<tr>
<td>@dixie_patriot</td>
<td>Oil spill cap catching about 10,000 barrels a day</td>
<td>LONDON ? BP's oil spill cap, designed to stop a huge leak from .. [link]</td>
</tr>
<tr>
<td>@MoCuad</td>
<td>My heart breaks all over again, every time I’m reminded of the oil spill.</td>
<td>[link]</td>
</tr>
<tr>
<td>@NFGNL</td>
<td>Looking for Liability in BP’s Gulf Oil Spill: White Collar Watch examines the potential criminal and civil liab.. [link]</td>
<td>[link]</td>
</tr>
</tbody>
</table>

[Bing-alike] Most tweeted URL-containing tweets

<table>
<thead>
<tr>
<th>User</th>
<th>Tweet Description</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>@jameeelee</td>
<td>How You Can Volunteer to Clean Up the Gulf of Mexico Oil Spill [link]</td>
<td>[link]</td>
</tr>
<tr>
<td>@conchkid</td>
<td>Gulf;Oil Spill Many Federal Judges Have Links To Oil Industry [link]</td>
<td>[link]</td>
</tr>
<tr>
<td>@NewsOnGreen</td>
<td>BP Oil Spill: Containment Cap To Be Replaced Next Month [link]</td>
<td>[link]</td>
</tr>
<tr>
<td>@TrinitySaveNeo</td>
<td>Citizen Speaks The Truth ON BP Gulf Oil Spill--the Govt, BP Are Doing Nothing, There Are No Leaders Here [link]</td>
<td>[link]</td>
</tr>
</tbody>
</table>

Proposed Method (user-weighted; $\omega=0.1$; ordered)

Proposed Method (user-weighted; $\omega=0.6$; ordered)
Quantitative evaluation framework

With wavelet transform

Without wavelet transform

Without entropy minimization

With entropy minimization

Without weighting (concentration parameters)

With weighting (concentration parameters)

Baseline 1 (B1)  Baseline 2 (B2)  Baseline 3 (B3)  Baseline 4 (B4)  Baseline 5 (B5)  Proposed Method (PM)
Quantitative evaluation

Oil Spill

iPhone
How does the sampling process impact users’ cognitive abilities of information consumption?
Cognitive metrics

• **Explicit Measures.** Explicit measures consisted of three 7-point Likert scale ratings made after reading each tweet set,
  – “interestingness”
  – “informativeness”

• **Implicit Measures.**
  – Subjective Duration Assessment [Czerwinski 2001] – ideally if the information presented in a tweet sample is very engaging, the participant would underestimate the time taken to go through it.
  – Recognition Memory for tweets already shown – related to encoding in the long-term memory [Sperling 1973, Smith 1979].
Part I

Please read the following sample of 10 tweets. When you are done reading, click the "Finished Reading!" button below to take a short evaluation of the tweet sample.

**Topic: Oil Spill [Tweet Sample, 3 of 12]**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>From user, @Bathern Fillip</td>
<td>Tweet: RT @rbndvd Blood used to be thicker than water. That was before the BP oil spill though.</td>
<td>Posted at: 2010-06-07 07:00:50</td>
</tr>
<tr>
<td>From user, @Pen</td>
<td>Tweet: RT @AP: AP Essay: Gulf oil spill is a reminder of why Americans have lost faith in nearly every national institution. <a href="http://bit.ly/cBcK">http://bit.ly/cBcK</a> ...</td>
<td>Posted at: 2010-06-07 07:01:24</td>
</tr>
<tr>
<td>From user, @addax27</td>
<td>Tweet: <a href="http://bit.ly/bpaQD2">http://bit.ly/bpaQD2</a> Gulf oil spill: Containment cap working well so far, says BP</td>
<td>Posted at: 2010-06-06 15:07:37</td>
</tr>
<tr>
<td>From user, @aaronpelkey</td>
<td>Tweet: RT @ScottBourne: If you find this meaningful I'd appreciate a RT - Don't Think Photography's Important? Impact of BP Oil Spill - http:// ...</td>
<td>Posted at: 2010-06-07 06:36:37</td>
</tr>
<tr>
<td>From user, @FrancePresFr</td>
<td>Tweet: BP Tries To Spin Oil Spill - Watch BP's New Ad (Video) - IndyPosted <a href="http://bit.ly/c4kkYQ">http://bit.ly/c4kkYQ</a></td>
<td>Posted at: 2010-06-06 15:40:05</td>
</tr>
<tr>
<td>From user, @winkj</td>
<td>Tweet: RT @TEDchrist: A Gulf oil spill picture I will never forget. <a href="http://twitpic.com/1toz8a">http://twitpic.com/1toz8a</a></td>
<td>Posted at: 2010-06-07 06:43:13</td>
</tr>
<tr>
<td>From user, @HuffingtonPost</td>
<td>Tweet: [The Huffington Post] New Orleans Saints To Visit Oil Spill Areas: Mentions Vince Lombardi Trophy and Bobby Jindal <a href="http://fca.me/99fc99">http://fca.me/99fc99</a></td>
<td>Posted at: 2010-06-06 18:51:51</td>
</tr>
<tr>
<td>From user, @curleytom</td>
<td>Tweet: Oil Spill: <a href="http://www.aquarianadvertising.com/info/wordpress/?p=3530">http://www.aquarianadvertising.com/info/wordpress/?p=3530</a></td>
<td>Posted at: 2010-06-07 05:53:45</td>
</tr>
<tr>
<td>From user, @12Tulip</td>
<td>Tweet: Oh yeah... Totally forgot about the stupid oil spill. Now I can't swim to the Bahamas lol</td>
<td>Posted at: 2010-06-06 20:20:56</td>
</tr>
</tbody>
</table>

User Study...
Part I

Please read the following sample of 10 tweets. When you are done reading, click the "Finished Reading!" button below to take a short evaluation of the tweet sample.

**Topic: Oil Spill [Tweet Sample, 3 of 12]**

<table>
<thead>
<tr>
<th>From user, @expertox</th>
<th>Tweet: Will The Oil Spill Affect You? [source URL]</th>
<th>Posted at: 2010-06-07 06:59:50</th>
</tr>
</thead>
<tbody>
<tr>
<td>From user, @Bethan_518</td>
<td>Tweet: RT @rbndvd Blood used to be thicker than water. That was before the BP oil spill though.</td>
<td>Posted at: 2010-06-07 07:00:50</td>
</tr>
<tr>
<td>From user, @experts</td>
<td>Tweet: RT @AP: AP Essay: Gulf oil spill is a reminder of why Americans have lost faith in nearly every national institution. [source URL]</td>
<td>Posted at: 2010-06-07 07:01:24</td>
</tr>
<tr>
<td>From user, @bobk</td>
<td>Tweet: <a href="http://bit.ly/bpaQD2">http://bit.ly/bpaQD2</a> Gulf oil spill: Containment cap working well so far, says BP</td>
<td>Posted at: 2010-06-06 15:07:37</td>
</tr>
<tr>
<td>From user, @bphoto</td>
<td>Tweet: RT @ScottBourne: If you find this meaningful I'd appreciate a RT - Don't Think Photography's Important? Impact of BP Oil Spill - [source URL]</td>
<td>Posted at: 2010-06-07 06:36:37</td>
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<td>From user, @morningcresh</td>
<td>Tweet: BP Tries To Spin Oil Spill - Watch BP's New Ad (Video) - Indy</td>
<td>Posted at: 2010-06-06 15:40:05</td>
</tr>
<tr>
<td>From user, @huffnews</td>
<td>Tweet: RT @TEDchriss: A Gulf oil spill picture I will never forget. [source URL]</td>
<td>Posted at: 2010-06-07 06:43:13</td>
</tr>
<tr>
<td>From user, @guardian</td>
<td>Tweet: [The Huffington Post] New Orleans Saints To Visit Oil Spill Areas: Mentions Vince Lombardi Trophy and Bobby Jindal [source URL]</td>
<td>Posted at: 2010-06-06 18:51:51</td>
</tr>
<tr>
<td>From user, @guardian</td>
<td>Tweet: Oil Spill: [source URL]</td>
<td>Posted at: 2010-06-07 05:53:45</td>
</tr>
<tr>
<td>From user, @1235</td>
<td>Tweet: Oh yeah... Totally forgot about the stupid oil spill. Now I can't swim to the Bahamas lol</td>
<td>Posted at: 2010-06-06 20:20:56</td>
</tr>
</tbody>
</table>

Now please respond to the following questions below:

a. Estimate the length of time, in minutes and seconds (e.g. in the format "X min, Y sec"), you think you needed to go through the tweets.

   [ ] min, [ ] sec

b. **INTERESTINGNESS:** How interesting did you find the tweets in the sample shown? In the scale below, 1 means not at all interesting, 7 means highly interesting.

   [ ] 1 2 3 4 5 6 7

c. **DIVERSITY:** How diverse did you find the tweets in the sample shown? A diverse set of tweets would contain different sub-topics, would appear to come from different parts of the world, would contain a mix of tweets and re-tweets, etc. In the scale below, 1 means the tweets are not at all diverse, 7 means they are highly diverse.

   [ ] 1 2 3 4 5 6 7

d. **INFORMATIVENESS:** How informative did you find the tweets in the sample shown? Note, although you'll notice that there are some repeating tweets across samples, rate the informativeness of the sample as a whole. In the scale below, 1 means the sample is not at all informative, and 7 means the sample is highly informative.

   [ ] 1 2 3 4 5 6 7

---

**User Study...**
In this final part of the study you are required to go through the following 72 tweets as presented below. Some of these you would have seen before, while others you wouldn’t have seen. Recognize if each of them was shown to you in any of the former pages. Each tweet has a "Yes" / "No" option: so please use your memory to recognize if you saw the tweet or not ("Yes" if you saw it, and "No" if you didn't). Good luck!

<table>
<thead>
<tr>
<th>User</th>
<th>Tweet</th>
<th>Date</th>
<th>Yes/No</th>
</tr>
</thead>
<tbody>
<tr>
<td>@malloryallyce</td>
<td>Yo, everyone buy Dawn dish soap $1 of each bottle goes to helping the poor animals affected by the oil spill. :(</td>
<td>2010-06-06 16:59:30</td>
<td>Yes/No</td>
</tr>
<tr>
<td>@ElevateU</td>
<td>RT @PoliticalTicker: House subcommittee holds hearing on oil spill <a href="http://bit.ly/clMJ4a">http://bit.ly/clMJ4a</a></td>
<td>2010-06-07 06:28:32</td>
<td>Yes/No</td>
</tr>
<tr>
<td>@mallonjones</td>
<td>RT @ElevateU: RT @PoliticalTicker: House subcommittee holds hearing on oil spill <a href="http://bit.ly/clMJ4a">http://bit.ly/clMJ4a</a></td>
<td>2010-06-07 06:28:32</td>
<td>Yes/No</td>
</tr>
<tr>
<td>@mallonjones</td>
<td>Tweet: I think Obama is really killing his chance of re-election with the happening and handling of the BP oil spill. Is this Obama’s 9/11?</td>
<td>2010-06-07 16:18:11</td>
<td>Yes/No</td>
</tr>
<tr>
<td>@nytimes</td>
<td>Tweet: RT @nytimescience: Pelicans, Back from Brink of Extinction, Face Threat From Oil Spill <a href="http://nyti.ms/cFGUoN">http://nyti.ms/cFGUoN</a></td>
<td>2010-06-07 12:55:47</td>
<td>Yes/No</td>
</tr>
<tr>
<td>@iHuffPost</td>
<td>Tweet: New Orleans Saints To Visit Oil Spill Areas: Mentions Vince Lombardi Trophy and Bobby Jindal <a href="http://iga.me/993669">http://iga.me/993669</a></td>
<td>2010-06-06 18:51:51</td>
<td>Yes/No</td>
</tr>
<tr>
<td>@jasonLeopold</td>
<td>RT @EnvironUpdates: NPR: Scientists: Dispersants Compounded Oil Spill <a href="http://bit.ly/dC0V6t">http://bit.ly/dC0V6t</a> Full <a href="http://n.pr/b51MvU">http://n.pr/b51MvU</a></td>
<td>2010-06-07 02:44:50</td>
<td>Yes/No</td>
</tr>
</tbody>
</table>
• 67 participants at a large organization (60% male, 40% female), median age 26 years.
• Samples on two trending topics from Twitter evaluated: “Oil spill” and “iPhone”.
• Three levels of diversity considered for the samples: 0.1, 0.6 and 0.9.

Usage of Twitter as a social / media tool

<table>
<thead>
<tr>
<th>#participants</th>
<th>1 (strictly for socially connecting with others)</th>
<th>2</th>
<th>3</th>
<th>4 (news/media source)</th>
<th>5</th>
<th>6</th>
<th>7 (strictly as a news/media source)</th>
</tr>
</thead>
</table>
Evaluation in terms of Cognitive Metrics

Informativeness

Interestingness

Degree of recognition

NPD

Baseline 1  Baseline 2  Baseline 3  Most Recent  MTU

Raw user rating

Normalized measure

Baseline 1  Baseline 2  Baseline 3  PM  Most Recent  MTU

Raw user rating

Normalized measure

PM

10/12/2010
What is the role of diversity in the sampling process?
Are there empirical bounds on what degrees of diversity in a sample best suit content consumption for users?
Participant ratings on different cognitive aspects of information consumption seems to be higher for highly homogenous and highly heterogeneous information samples.
Diversity/entropy impacts the cognitive information consumption process — so is there more to the information space topology, in terms of entropy, that can guide the sampling methodology?
Entropy signatures appear to have the following characteristics in the sampling process:

- Consistency
- Repeatability
- Uncertainty
Characteristics of entropy signatures in sampling process

**Topic: “Oil Spill”**

**Topic: “iPhone”**
How robust are the impacts of these entropy signatures?
Invariance property of entropy signatures

A. Consistency

B. Repeatability

C. Uncertainty
Entropy signature $\rightarrow$ Sampling?
Correlation of signature characteristics with sampling interval

A

“Oil Spill”

“iPhone”

“#worldcup”

B

Consistency

Repeatability

Uncertainty
Conclusions

• Sampling methodologies of large social information spaces that incorporate cognitive metrics of content consumption can enable the design of better content exploration interfaces.

  – Information diversity is key
  – User appear to cognitively encode information better, when presented with samples of high or low diversity
  – Our proposed sampling algorithms that incorporate cognitive metrics of content consumption perform better than straw-man versions of state-of-the-art techniques
Acknowledgements

- Advisor, Prof. Hari Sundaram, CS +AME, Arizona State University.
- Collaborator, Dr. Scott Counts, VIBE, Microsoft Research.
- Collaborator, Dr. Mary Czerwinski, VIBE, Microsoft Research.
- Twitter data: “full fire-hose” over June 2010, courtesy, Microsoft Research, Redmond.
Questions?

For details: munmun@asu.edu
Web: http://www.public.asu.edu/~mdechoud/
Twitter: @munmun10

And, I am in the job market! 😊
Robustness of sampling method

• Robustness of proposed sampling method across multiple iterations.
  – We show the degree of overlap of tweets corresponding to samples that are generated across iterations. The overlap values are shown for various sample sizes as well as three diversity parameter levels.
List of 30 trending topics from Twitter that were used for studying the robustness of our proposed sampling method. Broad thematic categories (hand-labeled) are indicated to indicate a wide span of topics.

<table>
<thead>
<tr>
<th>Type</th>
<th>Trending Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sports</td>
<td>NBA, Vuvuzela, #worldcup, Lakers, Suns</td>
</tr>
<tr>
<td>Entertainment</td>
<td>Star Trek, Harry Potter, New Moon, Twilight, American Idol, Inception</td>
</tr>
<tr>
<td>Celebrities</td>
<td>Lady Gaga, Michael Jackson, Justin Bieber, Lindsay Lohan</td>
</tr>
<tr>
<td>Technology</td>
<td>Tweetdeck, iPad, Snow Leopard, iPhone, Apple, At&amp;t, Google wave, Motorola</td>
</tr>
<tr>
<td>Politics</td>
<td>Barack Obama, McCain, Afghanistan</td>
</tr>
<tr>
<td>Global Affairs</td>
<td>H1N1, Haiti, Oil Spill</td>
</tr>
</tbody>
</table>

Statistical significance of performance of our proposed method across all the 30 trending topics. Performance is evaluated in terms of the $L_1$-norm distance between the entropy of the samples generated, and the desired diversity parameter values: 0.1 through 0.9, in increments of 0.1. High $p$-value indicates that the differences across topics are not significant, i.e., our method is consistent across topics.

<table>
<thead>
<tr>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F-statistic</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.18254</td>
<td>29</td>
<td>0.00629</td>
<td>0.85</td>
<td>0.6864</td>
</tr>
</tbody>
</table>