Introspective Users and Introspective Text: Some Recent Results

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Timeline

2011: PhD, Computer Science, University of Maryland
Metacognition in AI, dialogue systems, detection of mentioned language

2011-2013: Postdoctoral Fellow, Carnegie Mellon University
Usable privacy, mobile privacy, regret in online social networks

2013-2014: NSF International Research Fellow, University of Edinburgh

Characterization and detection of metalanguage
Also: collaboration with the Usable Privacy Policy Project
Faculty and Professional Collaborators

University of Maryland: Don Perlis
UMBC: Tim Oates
Franklin & Marshall College: Mike Anderson
Macquarie University: Robert Dale
National University of Singapore: Min-Yen Kan
Carnegie Mellon University: Norman Sadeh, Lorrie Cranor, Alessandro Acquisti, Noah Smith, Alan Black
University of Edinburgh: Jon Oberlander
University of Cambridge: Simone Teufel
Student Collaborators

Carnegie Mellon University: Hazim Almuhimedi, Bin Liu, Salem Hilal, Jon Breiger, Rob Murcek, Tommy Doyle

University of Cambridge: Kevin Heffernan
Usable Privacy: Motivations

You must be confused... It seems you have your Facebook status mixed up with your diary again.

http://www.painsquare.com/blog/images/PSN_1002_Blog_StickyNotes.JPG
http://stylettomag.co.uk/wp-content/uploads/2014/05/Diary.jpg
Oversharing in an online social network (OSN) can lead to regret.

Can we identify OSN content that individuals are likely to regret?

Can we help people maintain their professed sharing preferences?

http://time.com/3706434/cella-tweet-fired-texas-jets-pizza/

“I read my Twitter the next morning and was astonished”: A conversational perspective on Twitter regrets. Manya Sleeper, Justin Cranshaw, Patrick Gage Kelley, Blase Ur, Alessandro Acquisti, Lorrie Faith Cranor, Norman Sadeh. CHI 2013.
Twitter Deletion Study

OSN post deletion is potentially an indication of regret. Can we study regret via deletion?

We tracked 292K active Twitter users for one week and collected their public tweets.

We used deletion notices from the Twitter API to track when tweets were deleted.

How Are Deleted Tweets Different?

We collected a total of 6.7M tweets. 2.4% were deleted during the observation period.

In aggregate, there were some significant differences between deleted and undeleted tweets.

Tweet Location: Non-Deletion vs. Deletion

<table>
<thead>
<tr>
<th>Category</th>
<th>Undeleted</th>
<th>Deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travel &amp; Transport</td>
<td>0.9</td>
<td>1.5</td>
</tr>
<tr>
<td>Shop &amp; Service</td>
<td>1.3</td>
<td>2.2</td>
</tr>
<tr>
<td>Residence</td>
<td>1.2</td>
<td>1.8</td>
</tr>
<tr>
<td>Professional &amp; Other Places</td>
<td>1.4</td>
<td>2.0</td>
</tr>
<tr>
<td>Great Outdoors</td>
<td>1.6</td>
<td>2.6</td>
</tr>
<tr>
<td>Nightlife Spot</td>
<td>1.1</td>
<td>1.7</td>
</tr>
<tr>
<td>Food</td>
<td>0.6</td>
<td>1.1</td>
</tr>
<tr>
<td>College &amp; University</td>
<td>0.5</td>
<td>1.0</td>
</tr>
<tr>
<td>Arts &amp; Entertainment</td>
<td>0.4</td>
<td>0.8</td>
</tr>
</tbody>
</table>

% of geo-tagged tweets

51.4

Tweet Origin: Non-Deletion (Top) vs. Deletion (Bottom)

<table>
<thead>
<tr>
<th>Status Updates</th>
<th>Replies</th>
<th>Mentions</th>
<th>Retweets</th>
</tr>
</thead>
<tbody>
<tr>
<td>55.6</td>
<td>19.4</td>
<td>6.0</td>
<td>19.1</td>
</tr>
<tr>
<td>26.4</td>
<td>3.5</td>
<td>18.8</td>
<td></td>
</tr>
</tbody>
</table>
Discussion

- Deleting a tweet doesn’t mean it’s completely gone
- In aggregate, deleted tweets show some intuitive traits
- Still, in aggregate, deleted tweets are just barely distinctive
In the Pipeline: A User Study

### Ideal Scenario: Non-Retweets

<table>
<thead>
<tr>
<th>Action</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Make changes</td>
<td>38</td>
</tr>
<tr>
<td>Post nothing</td>
<td>34</td>
</tr>
<tr>
<td>No change</td>
<td>23</td>
</tr>
<tr>
<td>Other</td>
<td>5</td>
</tr>
</tbody>
</table>

### Ideal Scenario: Retweets

<table>
<thead>
<tr>
<th>Action</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do not retweet</td>
<td>47</td>
</tr>
<tr>
<td>No change</td>
<td>37</td>
</tr>
<tr>
<td>Add comments</td>
<td>13</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
</tr>
</tbody>
</table>
Location Sharing

Thanks

PLEASE ROB ME

Raising awareness about over-sharing
Locaccino (2010-2013)

Location sharing and CMU shuttle tracking
Available for iPhone and Android
~35,000 downloads

Requestor identity + Requestee location + Time of request = Location sharing rule

Study Motivation

Finely-configurable OSN privacy settings are

- **good**: they can reflect users’ nuanced preferences
- **bad**: they require attention to configure and maintain

Privacy profiles can represent users preferences.

- Mugan et al. clustered OSN users’ location sharing preferences.

How does presenting privacy profiles to users influence their comfort with location sharing?

Subjects were randomly assigned to two conditions:

- Treatment ("profile"): 16 subjects
- Control ("rule") condition: 18 subjects

After initializing their settings, subjects used Locaccino for three weeks. Every night they audited real and hypothetical location sharing requests.
Auditing: Composition of Results

**Control ("Rule")**

1. Request denied, unsatisfied
2. Request allowed, unsatisfied
3. Request denied, satisfied
4. Request allowed, satisfied

**Treatment ("Profile")**

1. Request denied, unsatisfied
2. Request allowed, unsatisfied
3. Request denied, satisfied
4. Request allowed, satisfied
The treatment group experienced a significant (p=0.05) increase in satisfaction from Week 1 to Week 3, but the rule condition did not (p=0.23).

By-week differences between the groups were not statistically significant.
Auditing: Sharing Rate

Both groups showed trends towards greater sharing.

The treatment group shared significantly more during Week 2 ($p=0.01$) with mild indications of the same for Week 1 ($p=0.13$) and Week 3 ($p=0.093$).
Discussion

Satisfaction in the conditions was roughly equal by the end of the study, but they never converged on an equal quantity of sharing.

Privacy profiles, as well as other efforts to simplify privacy choices, can have a significant impact on the levels of privacy that users select.
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Privacy Policy Coordinator
The Condé Nast Publications
1313 Market Street
Wilmington, DE 19801
Privacy_administration@condenast.com

Privacy policies are essentially read by no one
But Ideally?

Patrick Gage Kelley, Joanna Brsee, Robert W. Reeder, and Lorrie Faith Cranor.
The Usable Privacy Policy Project

Goal: use crowdsourcing, machine learning, and NLP techniques to automatically (or semi-automatically) extract salient details from privacy policies.

For details, visit www.usableprivacy.org
Topic Change
Communication in a document is not chiefly linear.

The entities that we refer to are not always external to the medium. Sometimes the referents are communicative artifacts.
Collecting Artifact References

Phrase templates can be used to retrieve many references to communicative artifacts (CAs).

<table>
<thead>
<tr>
<th>Category</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structural</td>
<td>Many of the resources listed elsewhere in <strong>this section</strong> have…</td>
</tr>
<tr>
<td></td>
<td>In <strong>this chapter</strong>, we will show you how to draw…</td>
</tr>
<tr>
<td>Illustrative</td>
<td>Consider <strong>these sentences</strong>: [followed by example sentences]</td>
</tr>
<tr>
<td></td>
<td>[following a source code fragment] …the first time the computer sees <strong>this statement</strong>, ‘a’ is zero, so it is less than 10.</td>
</tr>
<tr>
<td>Discourse</td>
<td>Utilizing <strong>this idea</strong>, subunit analogies were invented…</td>
</tr>
<tr>
<td></td>
<td>In <strong>this case</strong>, you’ve narrowed the topic down to “Badges.”</td>
</tr>
<tr>
<td>Non-Artifact Reference</td>
<td>Devices similar to resistors turn <strong>this energy</strong> into light, motion…</td>
</tr>
<tr>
<td></td>
<td>What type of things does a person in <strong>that career field</strong> know?</td>
</tr>
</tbody>
</table>

Word senses separate artifact references from other kinds of references.

There are many words for artifacts(!).

Goal: discriminate between synsets (word senses in WordNet) that refer to CAs from those that do not.
Accomplishments and Work in Progress

Done: a supervised learning approach to discriminating CA and non-CA senses
- Senses gathered using vocabulary in candidate phrases from Wikibooks, Wikipedia, and privacy policies
- High recall, low precision

In progress / future work: student projects
- Linking artifact references to their referents
- Applications to dialog systems
- Applications to educational materials?
Potential WWBP Tie-Ins

Some general thoughts:

- Online privacy is about much more than secrets
  - How is control of personal information on OSNs related to happiness?
  - What are the effects of undersharing on OSNs?

- How do people discuss discussion on social media?
  - Is it a common thing?
  - Can it tell us anything about what drives a discussion or how people feel about it?
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http://www.cs.cmu.edu/~shomir
Sentiment Differences

Keywords: AFINN-111 word valence list
Location Sharing Study: Wizards

Rule Wizard

1. Introduction to Locaccino
2. Choose people to share with
3. Choose when and/or where to share
4. Review rule parameters
5. Finish

Profile Wizard

1. Introduction to Locaccino
2. Choose people to always share with
3. Choose people to share with when at work
4. Option to edit settings in detail
5. Finish