Recently, research suggested that location privacy is not a relevant problem for today’s users, but it is too early to call off investigations of location privacy. We identify seven potential factors that at least influence the perception of location privacy. While some of these factors have been addressed in previous work, others need to be investigated from the ground up.

Location Privacy Revisited: Factors of Privacy Decisions

Our Study on Photo Sharing, Metadata and User Awareness

Online survey practiced with 414 university students; aged 23±4 years; 91.8% privacy pragmatists, 6% fundamentalists, and 2.2% unconcerned according to Westin’s privacy segmentation index. In our study, location raises high concerns for users: exact location is found to be the top concern, while broad location is perceived to have at least medium impact (cf. Figure 1).

Why does our data differ from prior related studies?
1) Our participants and their perception of privacy may differ from prior work.
2) Recent studies of location privacy addressed different contexts of using location information.

Prior Studies on Location Privacy


Seven Factors of Location Privacy Decisions

Tangibility of sharing channel
If tangible artifacts are used as sharing channel, privacy problems may become easier to grasp for people.

location attached to a photo vs. coordinates sent to a weather service

Information Lifespan (Volatility)
Data discoverable only within services like Foursquare or Facebook vs. data embedded in a photo on a public website (spreading, discoverability by search).

Personal Benefit
People weigh benefits of disclosing their location against potential privacy impact.

cf. [Fisher]

Sender-Content Relationship
Who shares location information about whom?

cf. Table 1

Culture & Society
Different attitudes towards privacy
e.g. USA vs. China vs. India

Audience of information
Public vs. friends
Internet-wide vs. closed community
(This poster online version does not contain foreign data please see original work for location disclosure to public/friends/advertisers/servers) from [PorterFelt], also cf. Table 2.

[Allen]

Frequent users may care less about privacy implications.
Awareness of information disclosure: In our study, 29% of those knowing metadata stated not to know what is invisibly stored in their shared photos.
Environment: Parents are more concerned about pictures of their children. [Ahern]

Table 1. Possible privacy impact of metadata in shared photos either added by the user (a) or by other (b). (1 = very low to 7 = very high)

<table>
<thead>
<tr>
<th>Metadata added by with impact to</th>
<th>(a) participant</th>
<th>(b) others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
</tr>
<tr>
<td>headline, description, tags</td>
<td>2.94</td>
<td>1.66</td>
</tr>
<tr>
<td>date &amp; time of creation</td>
<td>3.63</td>
<td>1.70</td>
</tr>
<tr>
<td>photographer’s name</td>
<td>3.49</td>
<td>1.79</td>
</tr>
<tr>
<td>depicted peoples’ names</td>
<td>5.08</td>
<td>1.70</td>
</tr>
<tr>
<td>exact location (city, region)</td>
<td>3.95</td>
<td>1.62</td>
</tr>
<tr>
<td>GPS coordinates</td>
<td>5.31</td>
<td>1.68</td>
</tr>
</tbody>
</table>

Table 2. Influence of audience when disclosing a photo with location. (1 = very unconcerned to 7 = very concerned)

<table>
<thead>
<tr>
<th>Audience of information</th>
<th>Feeling (mean)</th>
<th>Top 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>friends</td>
<td>3.24 (1.5)</td>
<td>3.9</td>
</tr>
<tr>
<td>indirect friends</td>
<td>3.51 (1.7)</td>
<td>14.3</td>
</tr>
<tr>
<td>strangers</td>
<td>5.16 (1.8)</td>
<td>51.9</td>
</tr>
<tr>
<td>hosting service</td>
<td>5.23 (1.9)</td>
<td>54.1</td>
</tr>
<tr>
<td>privacy service</td>
<td>5.28 (1.9)</td>
<td>57.2</td>
</tr>
</tbody>
</table>

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