PRIVACY ATTACKS IN SOCIAL MEDIA USING PHOTO TAGGING NETWORKS: A CASE STUDY WITH FACEBOOK

JOÃO PAULO PESCE
jpesce@dcc.ufmg.br

GUSTAVO RAUBER
rauber@dcc.ufmg.br

DIEGO LAS CASAS
diegolascasas@psi.grad.ufmg.br

VIRGÍLIO ALMEIDA
virgilio@dcc.ufmg.br
COLLATERAL DAMAGE

unintentionally putting privacy at risk when sharing information
MI6 chief blows his cover as wife's Facebook account reveals family holidays, showbiz friends and links to David Irving

By JASON LEWIS
UPDATED: 18:14 GMT, 5 July 2009

The new head of MI6 has been left exposed by a major personal security breach after his wife published intimate photographs and family details on the Facebook website.

Sir John Sawers is due to take over as chief of the Secret Intelligence Service in November, putting him in charge of all Britain's spying operations abroad.

But his wife's entries on the social networking site have exposed potentially compromising details about where they live and work, who their friends are and where they spend their holidays.
PHOTO TAGGING

In this photo: John Doe for [photos - remove tag], Carolina Regan for [photos], Jaime Cameron for [photos]
PREDICTION ALGORITHMS

- Paul
- George
- Linda
- Eric
- Pattie
- Ringo
- Stu
- Astrid

Graph structure: Center node is John, connected to Paul, George, Linda, Eric, Pattie, Ringo, Stu, and Astrid.
1. PHYSICAL CLOSENESS
2. MORE SOCIAL
3. INTERACTION
DATA COLLECTION

facebook app theprivacystudy.org

The Privacy Study

Please, help us spread our application on Facebook through any of the means below:

Tweet it!  
Felipe Torres, Daniel Brasil and 269 others like this.

Buzz it!

Like it!

Print and affix the poster!

Install the Facebook Privacy Study App and get a chance to win a brand new iPod Touch with FaceTime or one out of 5 digital copies of Starcraft II! Tell all your friends about it!

Get your friends to install the application and increase your chances to win a prize!
744 PARTICIPANTS

~119k USERS
FRIENDS EGO-NETWORK LOOKUP (FEL)
baseline algorithm
FRIENDS EGO-NETWORK LOOKUP (FEL)
baseline algorithm
TAGGED FRIENDS EGO-NETWORK LOOKUP (TFEL)
TAGGED FRIENDS EGO-NETWORK LOOKUP (TFEL)

- John
- Paul
- George
- Ringo
- Stu
- Astrid
- Linda
- Eric
- Pattie
WEIGHTED TAGGED FRIENDS EGO-NETWORK LOOKUP (WTFEL)
WEIGHTED TAGGED FRIENDS EGO-NETWORK LOOKUP (WTFEL)

- Paul
- George
- Ringo
- Stu
- Astrid
- Linda
- Eric
- Pattie

Connections:
- Paul: 1
- George: 3
- Ringo: 5

John is the central figure in the network.
RESULTS

current city, current country and gender

<table>
<thead>
<tr>
<th></th>
<th>FEL</th>
<th>TFEL</th>
<th>WTFEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current City</td>
<td>54.0%</td>
<td>65.8%</td>
<td>77.5%</td>
</tr>
<tr>
<td>Current Country</td>
<td>80.2%</td>
<td>88.3%</td>
<td>93.7%</td>
</tr>
<tr>
<td>Gender</td>
<td>73.9%</td>
<td>85.7%</td>
<td>89.1%</td>
</tr>
</tbody>
</table>

**bold values** are statistically significant when using chi-square
RESULTS

chi-square and one-way ANOVA show no statistically significant difference
WHY?

specific age group

~44%

USERS AGED 18-25
Simmelian Ties

1. Promote trust
2. Reduce individuality
3. Promote homophily
CLUSTERING COEFFICIENT
PHOTO TAGS

1. enhance the accuracy of prediction algorithms
2. can act as a filter
THANK YOU

JOÃO PAULO PESCE

jpesce@dcc.ufmg.br