Effect of Mood, Location, Trust, and Presence of Others on Video-Based Social Authentication

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Video-based Social Authentication

Fallback authentication utilize video chats with social networks.

- Video-based social authentication is feasible within a small group of people who know and trust each other well.

- Future video-based social authentication systems should integrate mood and location detection.
Nearly **three-quarters** of people report they often or sometimes forget a password\(^1\)

\[84\% \text{ of users forget a password at least once a year}\] \(^2\)

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2. Gigya, Inc. Survey guide: Businesses should begin preparing for the death of the password, 2016
So how to recover your accounts?

Fallback authentications needed!
Security Questions
Problems with Security Questions

About 33% of answers can be guessed by those who are close to the users\(^1\)

Nearly 40% can be guessed by parents, partners, close friends, etc.\(^2\)

It is nearly impossible to design security questions that are both secure and memorable.\(^3\)

Out-of-band Authentication

New forms of fallback authentication are needed!

Social authentication has shown to be promising!
Device Notarization

1. Notarization request
2. Video chat
3. Notarization granted
A Four-week-long Experience Sampling Study

30 participants (43% female)

Five groups (combination of strangers and people they knew)

Two or three questionaries via SMS per day (72 in total; 36 for initiate, 36 for help)

Participants were instructed about the video-based social authentication and to provide perceived willingness to use such authentication
To access your Gmail app, would you video chat at this time? Respond here: http://bit.ly/xxxxxx

App you are accessing: *

Short answer text

Would you be willing to initiate a video chat session with someone in your network in order to access that app? *

- Yes
- No
Would you help Alice in your network via video chat at this time?

Person you are helping: *

Short answer text

Will you help that individual access their mobile app by conducting a video chat session with them?

- Yes
- No
Questionnaire measurements

Agree or decline the prompt

Reasons to agree or decline

Mood (Brief Mood Introspection Scale, four-point Likert)

Location

Presence of others
What did we find?

Logistic regressions with repeated measures
Mood matters

**Initiate**

- Mood

![initiate_graph](image)

\[ p < .001 \]

**Help**

- Mood

![help_graph](image)

\[ p < .001 \]
I’m grumpy in the morning, and I don’t think I would be very enjoyable to video chat with right now. - P25
Location matters

**Initiate**

<table>
<thead>
<tr>
<th>Location</th>
<th>Agree</th>
<th>Decline</th>
</tr>
</thead>
<tbody>
<tr>
<td>At home</td>
<td>47%</td>
<td>53%</td>
</tr>
<tr>
<td>At work</td>
<td>75%</td>
<td>25%</td>
</tr>
<tr>
<td>At school</td>
<td>70%</td>
<td>30%</td>
</tr>
<tr>
<td>Driving a vehicle</td>
<td>88%</td>
<td>12%</td>
</tr>
<tr>
<td>Riding a vehicle</td>
<td>47%</td>
<td>53%</td>
</tr>
<tr>
<td>Someone else's house</td>
<td>73%</td>
<td>27%</td>
</tr>
<tr>
<td>Other public places</td>
<td>37%</td>
<td>63%</td>
</tr>
</tbody>
</table>

Overall effect: $p = .002$
At work vs. At home: $p = .001$
Driving a vehicle vs. At home: $p < .001$

**Help**

<table>
<thead>
<tr>
<th>Location</th>
<th>Agree</th>
<th>Decline</th>
</tr>
</thead>
<tbody>
<tr>
<td>At home</td>
<td>39%</td>
<td>61%</td>
</tr>
<tr>
<td>At work</td>
<td>71%</td>
<td>29%</td>
</tr>
<tr>
<td>At school</td>
<td>60%</td>
<td>40%</td>
</tr>
<tr>
<td>Driving a vehicle</td>
<td>87%</td>
<td>13%</td>
</tr>
<tr>
<td>Someone else's house</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>Other public places</td>
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<td>61%</td>
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</table>

Overall effect: $p < .001$
At work vs. At home: $p = .001$
Driving a vehicle vs. At home: $p < .001$
Presence of others matters

**Initiate**

<table>
<thead>
<tr>
<th></th>
<th>Others around</th>
<th></th>
<th>Others around</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Agree</td>
<td>Decline</td>
<td>Agree</td>
<td>Decline</td>
</tr>
<tr>
<td>Alone</td>
<td>50%</td>
<td>50%</td>
<td>59%</td>
<td>41%</td>
</tr>
<tr>
<td>People I know</td>
<td>50%</td>
<td>41%</td>
<td>43%</td>
<td>57%</td>
</tr>
<tr>
<td>Strangers</td>
<td>21%</td>
<td>79%</td>
<td>21%</td>
<td>79%</td>
</tr>
</tbody>
</table>

Overall effect: $p = .008$
Strangers vs. Alone: $p = .002$

**Help**

<table>
<thead>
<tr>
<th></th>
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<td>53%</td>
<td>47%</td>
</tr>
<tr>
<td>Strangers</td>
<td>33%</td>
<td>67%</td>
<td>33%</td>
<td>67%</td>
</tr>
</tbody>
</table>

Overall effect: $p < .001$
People I know vs. Alone: $p < .001$
Strangers vs. Alone: $p = .002$
Sometimes I did not have the **flexibility** or **availability** to verify anyone in my network **right when they needed me**. I was often in meetings, driving in my car, or coaching hockey for my children. - P25
What can we do?

Use mood and location detection!
Trust matters

Overall effect: $p < .001$
Only because it’s Alice. - P19

… if I cannot get access to the app and my family or friends can help me out. - P4
What’s next?

Use video-based social authentication in a small group of people who know and trust each other well!
To access your Gmail app, would you video chat at this time?

Choose a contact to start video chat

- Mom: Available
- Alice: Likely available
- Dad: Unavailable
Thank You!

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