#0916612: Online Privacy and Senior Citizens: A Socio-Technical Multi-Perspective Framework for Trustworthy Operations

- Inter-Cultural Privacy Comparison among the Older and Younger Generations: *Ponnurangam Kumaraguru, Sharmistha Bagchi-Sen, Rajarshi Chakraborty, H. Raghav Rao and Shambhu J. Upadhyaya*
- Older Adults and Privacy on Social Media: *Rajarshi Chakraborty, Claire Vishik and H. Raghav Rao*
- Aging and the Internet: usage, perception and behavior: *Sharmistha Bagchi-Sen, Rajarshi Chakraborty, H. Raghav Rao and Shambhu J. Upadhyaya*
- E-health and Personal Health Information Leakage: *Ruchika Mehresh, Arun Keepanasseril, H.R.Rao and Shambhu J. Upadhyaya*
- The Early (tweet-ing) Bird Spreads the Worm: An Assessment of Twitter for Malware Propagation: *Ameya Sanzgiri, Jacob Joyce, Shambhu Upadhyaya*
Research Challenge: How do older adults living in the East get influenced by their children living in the West in their attitude towards Information Privacy on the Internet?
Inter-Cultural Privacy Comparison

Ponnurangam Kumaraguru, Sharmistha Bagchi-Sen, Rajarshi Chakraborty, H. Raghav Rao and Shambhu J. Upadhyaya

Privacy in Individualistic Society Vs. Privacy in Collectivist Society

USA is an individualistic society

India is a collectivist society

Hofstede 2001

Dyadic Parent-Child Relationships
Sharing Knowledge
Difference in Privacy Perceptions

Data Collection +

Immigrant Child with US-based Privacy Attitude

Older Adult Parent with India-based Privacy Attitude
Privacy on Social Media
Rajarshi Chakraborty, Claire Vishik and H. Raghav Rao

Research Challenge: *Do older adults take privacy-preserving opt-out sharing decisions on Social Media when more of their friends do the same?*

Older Adults on Social Networking from 2009 to 2010: 
22% to 42%

Facebook sharing is mostly **Opt-Out**

**Facebook Profile:**
- Activities & Interests
- Education & Work
- Sex / Relationship Status
- Location
- Photos

**Method**

Collect Facebook Profile Pages (public view)
→ Look for Keywords (College/Work/Photos)
→ Compare between Older Adult & Her Friends
Privacy on Social Media

Rajarshi Chakraborty, Claire Vishik and H. Raghav Rao

**Measure:** Similarity Index for each profile attribute $x$

**Attribute $x$:** Photos / Employer / College

$X_{ji} =$ Binary indicator of attribute for Friend $j$ for older adult $i$

$N(F_i) =$ # of Friends of older adult $i$

**Similarity-Index$_X$**

**Dependent Variable:** Odds-Ratio for Photos / Employer / College

**Future Research**

★ Conduct Survey to measure privacy concern about Facebook sharing

★ Compare perceptions and attitude with real sharing actions

★ Seek permission to measure difference in sharing between different levels of visibility
Aging and the Internet: usage, perception and behavior: Sharmistha Bagchi-Sen, Rajarshi Chakraborty, H. R. Rao, and Shambhu Upadhyaya
University at Buffalo

Challenge

• Understanding internet usage, perception, and behavior of older adults with a specific focus on privacy and security.

• Data collected from online survey through senior centers, support groups, and clubs for older adults

✧ Sample size: 117
Data Analysis – In progress

Survey Items

• Security Awareness – dependent variable: Ability to differentiate between safe and unsafe websites
• Perceived Cost of Security: Privacy protection/security is expensive
• Perceived Benefit of the Internet: It is worth giving out personal information for free benefits (e.g., shopping, email)
• Internet Efficacy/Tech confidence: Sense of safety on the Internet, ability to distinguish what is suspicious/legitimate and what is not
• Risk Aversion: Uncomfortable giving out personal information
• Privacy Concerns: Online privacy is users’ right to exercise control and autonomy over decisions
• Cognitive Aging: Feeling younger/older than current age
• Nostalgia Proneness: Tech is generally improving human welfare
E-health and Personal Health Information Leakage: Ruchika Mehresh, Arun Keepanasseril, H.R. Rao and Shambhu J. Upadhyaya

• Adoption of EHRS results in privacy/security issues
  – Solution: Introduction of compliance procedures like, PHIPA, HIPAA, etc.
  – Compliance procedures incur excessive overhead, both in terms of operating cost and efficiency

• Challenge
  – To develop a solution that focuses on quick identification and prevention of information leak
E-health and Personal Health Information Leakage

• Solution under investigation:
  – A supplement to the existing compliance procedures
  – List-based detection of underlying sources of information leak in health information systems
  – Each item of the list corresponds to an event
  – An event has an associated list of possible sources of information leak to be checked out
• Example
  • Event: New employee hired
  • Possible sources of information leakage: Background check, access privilege modifications for the new, as well as, the affected employees, etc.
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Assessment of Twitter for Malware Propagation

Malware propagation traditionally through

– Emails
– Links in wiki/web forums

Social networking provide a new medium

– Paths already set up for propagation
– Large amount of information flow
  • Detection is difficult
– New Medium (not lot of people understand intricacies)
– Trust built between people through years of interaction
Twitter Model

• Information exchange through tweets.
• Can be broken into two entities
  • User Follower: High Trust
  • #tag/trending topic followers
• Short URL’s in tweets *obfuscate* information
  • Miscreants can insert short-URLs to malware sites and
  • Leverage trust between users to entice click on links
• Even with low degree of connectivity and low probability of clicking links, such malware propagation would be rampant
• Modeled using epidemic theory
• Effect too devastating to ignore. More research is needed to analyze the risk of attack.

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