

Mental Models of Domain Names and URLs

Richard Roberts, Daniela Lulli, Aboleer Raut, Kelsey R. Fulton, Dave Levin

Motivation

Many users are **unable to identify** fraudulent, impersonating domains and URLs:

apple.com.find-device-location.review
 www.google-search.com
 facebook.com
 ebay.com-item-apple-iphone-x-gray-256gb-unlocked.kl7.us
 d05de63f3.pw/login.google.com
 yahoo.com
 facebook.com.token-03144cce5266c0bf3f3.pw

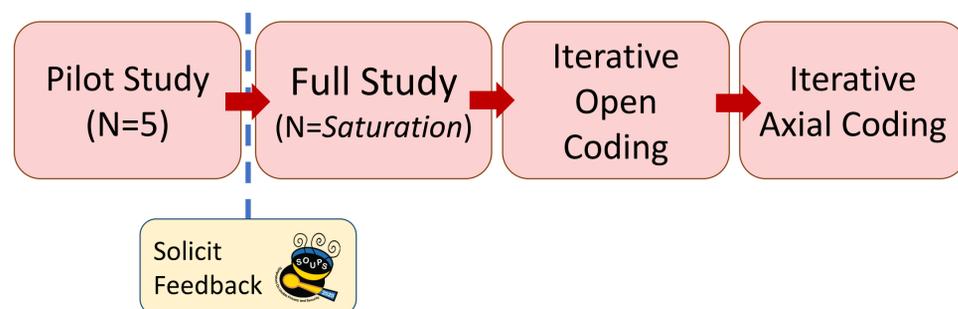
Research Questions

- Why are users tricked by impersonating domains?
- What **mental models** do users have about how domains/URLs are used?

Methodology

- 1 hour, semi-structured interview
- Diverse Population (Recruit via Craigslist)
- Compensate participants (\$30 gift card)
- IRB approved
- Pilot interview script before full-scale study

Research Plan



Pilot Responses

Only 2 subjects used the URL to verify what website they were on

“I look for the company logo.” –P3

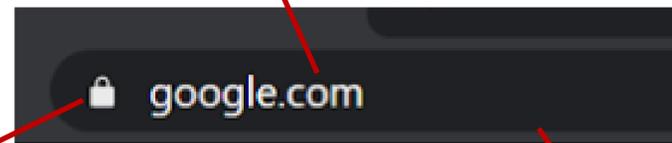
Subjects use “www.” or “.com” to orient themselves

“It goes to a secure login page.” –P1
 crumptury.com-login.secure

Subjects were most wary of typos, but accepted structural impersonation with varying degrees of comfort and confidence

Lock icon means: safety, encryption, website accepts personal information, Google says it is ok, you can buy something there

“It’s impossible for a lock to be next to a bad URL.” –P5



4 subjects primarily associate the address bar with web searches, not URLs

“A hyphen (-) is the same as a slash (/).” –P2

Interview Protocol

1. Navigation Tasks

“Please Navigate to youtube.com.”
 “How do you know you are on YouTube?”

2. Security Hygiene

“What are some things you do to stay safe online?”
 “Where did you learn about these things?”

3. Domain Presentation and Registration

“How do you think a company gets a URL?”
 “Is there anything not allowed in a URL?”

4. Domain Comprehension

“What would you expect to see in the blank? What does it represent?”
 ____google.com

5. Brand Identification

“What is the name of the fictional company that owns this URL?”
 crumptury.com-
 login.secure

6. Domain Component Comparison

“Which parts of these URLs have the same technical purpose?”
 amazon.com/login
 login.ebay.com

7. Free-Form Domain Responses

“Do you have any thoughts about this domain?”
 google-search.com

4. Lock Icon and Impersonation

“What does it mean if the lock is not there?”
 “Why might a website pretend to be a different website?”